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EDUCATIONAL PSYCHOLOGY

WIKIS IN THE COLLEGE CLASSROOM: A COMPARATIVE STUDY OF ONLINE AND FACE-TO-FACE GROUP COLLABORATION AT A PRIVATE LIBERAL ARTS UNIVERSITY (260 pp.)

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Wikis are Web-based online software programs that allow any user to add, edit, or delete content on a Wiki web page. Because of their relative simplicity and their interactive nature, Wikis are potentially effective tools for online collaborative group work, a type of activity frequently used in online distance education. This study examined online Wiki collaboration compared to more conventional face-to-face group collaboration in higher education.

The study participants were juniors and seniors taking a senior-level broadcast communications course. They were divided into two groups, and each group collaborated on writing reports using both conventional face-to-face collaboration methods and collaboration using the Wiki function in Moodle course management software. Following completion of the reports, professional subject matter experts rated the quality of the reports according to specified content and format criteria. The study’s research questions addressed (1) benefits and obstacles experienced in face-to-face collaboration; (2) benefits and obstacles experienced in Wiki-based group collaboration; (3) whether there was a difference between Wiki group collaboration and face-to-face group collaboration in terms of the quality of the final product; and (4) whether there was a difference in
students’ experiences of learning and sense of community after Wiki-based collaboration and face-to-face collaboration assignments.

Results indicated there was no difference in the quality of reports related to the method of collaboration, suggesting that Wikis are an effective collaboration method; face-to-face collaboration is more efficient in terms of communication among group members and is sometimes preferred because it is familiar; Wiki collaboration allowed students to work at their own pace and to easily see the work of other group members; students adapted Wiki capabilities to their previous methods of group work; and there was not a significant difference in students’ experiences of learning and community between the two methods. Even though the Wiki software provided the capability, participants did not edit one another’s Wiki work unless they had volunteered and were designated by the group to be an editor. Unless they were an editor, individual participants did not feel it was appropriate to change their peers’ work.
WIKIS IN THE COLLEGE CLASSROOM:
A COMPARATIVE STUDY OF ONLINE AND FACE-TO-FACE
GROUP COLLABORATION AT A PRIVATE LIBERAL ARTS UNIVERSITY

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iii
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>x</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Collaborative Learning</td>
<td>2</td>
</tr>
<tr>
<td>Web 2.0</td>
<td>3</td>
</tr>
<tr>
<td>Web 2.0 in Education</td>
<td>4</td>
</tr>
<tr>
<td>Wikis: Online Collaboration Tools</td>
<td>6</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>8</td>
</tr>
<tr>
<td>Research Questions</td>
<td>9</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>9</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>10</td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE</td>
<td>13</td>
</tr>
<tr>
<td>Introduction</td>
<td>13</td>
</tr>
<tr>
<td>Communication Cultures</td>
<td>14</td>
</tr>
<tr>
<td>The New Learners</td>
<td>16</td>
</tr>
<tr>
<td>Education and Technology</td>
<td>21</td>
</tr>
</tbody>
</table>
III. RESEARCH METHODOLOGY

Hypermedia ........................................................................................................................................... 21
The Internet and World Wide Web ........................................................................................................... 24
Web 2.0 ....................................................................................................................................................... 27
Community and Learning ......................................................................................................................... 32
Collaboration and the Construction of Meaningful Knowledge ............................................................... 35
Collaborative and Cooperative Learning ................................................................................................. 36
The Five Stages of Group Development ................................................................................................... 45
Cooperative Learning: Students, Teaching, and Assessment ................................................................. 47
Constructivism and Group Collaboration Through Technology ............................................................. 52
Electronic Collaboration ......................................................................................................................... 55
Wikis: Online Group Collaboration Tools ............................................................................................... 59
Wikis in Education .................................................................................................................................... 65
Challenges in Using Wikis in Education ................................................................................................. 69
Summary and Conclusion .......................................................................................................................... 73

III. RESEARCH METHODOLOGY .............................................................................................................. 75

Introduction ............................................................................................................................................... 75
Population .................................................................................................................................................. 75
Wiki Software Used in the Study ............................................................................................................. 76
Study Procedure ....................................................................................................................................... 77
Quality of Assignments ............................................................................................................................. 86
Learning and Community ....................................................................................................................... 87
Data Analysis ............................................................................................................................................ 87
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of Group Report Quality</td>
<td>90</td>
</tr>
<tr>
<td>IV. RESULTS AND ANALYSIS OF DATA</td>
<td>92</td>
</tr>
<tr>
<td>Introduction</td>
<td>92</td>
</tr>
<tr>
<td>Study Participants</td>
<td>92</td>
</tr>
<tr>
<td>Advantages of Face-to-Face Group Collaboration</td>
<td>100</td>
</tr>
<tr>
<td>Disadvantages of Face-to-Face Group Collaboration</td>
<td>103</td>
</tr>
<tr>
<td>Advantages of Wiki-Based Group Collaboration</td>
<td>105</td>
</tr>
<tr>
<td>Disadvantages of Wiki-Based Group Collaboration</td>
<td>108</td>
</tr>
<tr>
<td>Group Collaboration Characteristics</td>
<td>110</td>
</tr>
<tr>
<td>Collaboration Method Preference</td>
<td>113</td>
</tr>
<tr>
<td>Wiki Collaboration</td>
<td>119</td>
</tr>
<tr>
<td>Quality of Assignments</td>
<td>128</td>
</tr>
<tr>
<td>Learning and Community</td>
<td>134</td>
</tr>
<tr>
<td>V. SUMMARY AND DISCUSSION OF RESULTS</td>
<td>143</td>
</tr>
<tr>
<td>Introduction</td>
<td>143</td>
</tr>
<tr>
<td>Summary of the Study</td>
<td>143</td>
</tr>
<tr>
<td>Discussion of Research Question Results</td>
<td>144</td>
</tr>
<tr>
<td>Group Collaboration and Wikis</td>
<td>150</td>
</tr>
<tr>
<td>Limitations of the Study</td>
<td>158</td>
</tr>
<tr>
<td>Implications for Action</td>
<td>161</td>
</tr>
<tr>
<td>Philosophical Issues Related to Wikis</td>
<td>165</td>
</tr>
<tr>
<td>Additional Recommendations for Future Research</td>
<td>168</td>
</tr>
</tbody>
</table>
Conclusion................................................................................................................................. 169

APPENDICES ................................................................................................................................ 171

APPENDIX A. CONSENT FORMS ................................................................................................. 172

APPENDIX B. ONLINE SURVEY ITEMS ....................................................................................... 175

APPENDIX C. INTERVIEW QUESTIONS ....................................................................................... 187

APPENDIX D. INTERVIEW QUESTIONS AND ANSWERS .......................................................... 189

APPENDIX E. GROUP REPORTS .................................................................................................. 213

REFERENCES .................................................................................................................................. 245
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The shift from broadcast to interactive learning</td>
</tr>
<tr>
<td>2.</td>
<td>Top-down approach to learning</td>
</tr>
<tr>
<td>3.</td>
<td>Knowledge distribution among persons</td>
</tr>
<tr>
<td>4.</td>
<td>Assignment instruction handout for Group Project 1</td>
</tr>
<tr>
<td>5.</td>
<td>Neutral point of view handout</td>
</tr>
<tr>
<td>6.</td>
<td>Assignment instruction handout for Group Project 2</td>
</tr>
<tr>
<td>7.</td>
<td>Report evaluation form sent to communications industry professionals</td>
</tr>
<tr>
<td>8.</td>
<td>Study groups’ demographic summary</td>
</tr>
<tr>
<td>9.</td>
<td>Participants’ weekly use of computers, the Internet and mobile devices for academic work and for social communication</td>
</tr>
<tr>
<td>10.</td>
<td>Access location to Wiki program for study activities</td>
</tr>
<tr>
<td>11.</td>
<td>Participants’ preferred method of collaboration by group</td>
</tr>
<tr>
<td>12.</td>
<td>Professionals’ total scores for group reports</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Study Participants: Selected Demographic Information</td>
<td>94</td>
</tr>
<tr>
<td>2. Survey Responses: Participants’ Technology Use</td>
<td>95</td>
</tr>
<tr>
<td>3. Group 1 Survey Responses: Advantages in Face-to-Face Collaboration</td>
<td>101</td>
</tr>
<tr>
<td>4. Group 2 Survey Responses: Advantages in Face-to-Face Collaboration</td>
<td>102</td>
</tr>
<tr>
<td>5. Group 1 Survey Responses: Disadvantages in Face-to-Face Collaboration</td>
<td>104</td>
</tr>
<tr>
<td>6. Group 2 Survey Responses: Disadvantages in Face-to-Face Collaboration</td>
<td>105</td>
</tr>
<tr>
<td>7. Group 1 Survey Responses: Advantages in Wiki-Based Collaboration</td>
<td>106</td>
</tr>
<tr>
<td>8. Group 2 Survey Responses: Advantages in Wiki-Based Collaboration</td>
<td>107</td>
</tr>
<tr>
<td>9. Group 1 Survey Responses: Disadvantages in Wiki-Based Collaboration</td>
<td>108</td>
</tr>
<tr>
<td>10. Group 2 Survey Responses: Disadvantages in Wiki-Based Collaboration</td>
<td>109</td>
</tr>
<tr>
<td>11. Collaboration Survey Mean Scores by Collaboration Method</td>
<td>111</td>
</tr>
<tr>
<td>12. Group Collaboration Characteristics Total Scores by Method</td>
<td>112</td>
</tr>
<tr>
<td>13. Participants’ Written Survey Responses Stating Preferred Method of Collaboration and Reasons for Preferences</td>
<td>115</td>
</tr>
<tr>
<td>14. Participants’ Interview Questions Response Methods</td>
<td>117</td>
</tr>
<tr>
<td>15. Wiki History Function Report: Wiki Editing Activity Totals by Group and Participant</td>
<td>120</td>
</tr>
<tr>
<td>16. History Function Report: Group 1’s Wiki Editing Activity</td>
<td>121</td>
</tr>
</tbody>
</table>
17. History Function Report: Group 2’s Wiki Editing Activity........................................122
18. Wiki Collaboration Survey: Use of Wiki Tools..........................................................125
20. Report Reviewers ........................................................................................................128
21. Quality Scores of Radio Reports (Assignment 1). Group 1 = Face-to-Face
   Collaboration; Group 2 = Wiki Collaboration ..............................................................130
22. Quality Scores of Television Reports (Assignment 2). Group 1 = Wiki
   Collaboration; Group 2 = Face-to-Face Collaboration ..................................................131
23. Classroom Community Scale Item Scoring Weights ....................................................135
24. Classroom Community Scale Scores: Baseline and Face-to-Face
   Collaboration...............................................................................................................136
25. Classroom Community Scale Scores: Baseline Wiki Collaboration............................138
26. Classroom Community Scale Scores: Face-to-Face and Wiki Collaboration .... 140
CHAPTER I
INTRODUCTION

In recent years, increasing attention has been paid to differences between teaching and learning. Educators at all levels have been looking at the difference and seeking ways to implement more effective education for their students. The differences between teaching and learning include a variety of areas. Traditional teaching frequently tends to be objective, with the instructor often taking a detached approach to presenting the subject being taught. Learning, on the other hand, tends to be more subjective, involving a person’s own understanding of the subject or involvement with the material. Another difference is that in the teaching paradigm, students frequently tend to be passive. They receive information or may observe information, but they do not become involved in the information gathering. On the other hand, in a learning-centered approach, students are often actively involved in the creation of learning and the materials with which they are working. A constructivist approach may be used in which the students are active learners. This can lead to more ownership of knowledge on the learner’s part as opposed to teaching in which there tends to be less ownership of the knowledge because of a lack of involvement in the process. There is also a risk that in the teaching paradigm, information may be static, based more on a teacher’s existing information about a subject, often outdated, particularly in rapidly-changing disciplines. Learning, on the other hand, through its active involvement of the students, helps to develop necessary information
gathering and processing skills that are needed in the current information-rich society where information expands at a very rapid rate.

Collaborative Learning

In spite of demonstrated advantages of collaborative work, “the academic world still clearly and consistently merits the efforts of the individual” over collaboration (Knowles & Hennequin, 2004, p. 94).

For example, most educational institutions regularly assign the responsibility for a course to one teacher, and most classrooms evaluate the work of one student on a universal scale (A-F) separate from his or her classroom context. Our students arrive in our classrooms trained to devalue collaboration by their previous educational experience; they often resist collaborative work, and when required to do it, they may not know how to proceed . . .

Although the mere logistics of collaboration frightens some students, others are actively discouraged by group projects gone horribly wrong in past classes. Because of these bad experiences and the problems of organizing collaborative projects, most students see little value in collaborating and actively avoid collaboration when possible, opting instead to work alone. (pp. 94-95)

Social constructive pedagogical models which consider knowledge as a social construct, however, “ha[ve] made collaborative learning a more widely accepted means to encourage active, authentic, student-centered learning” (Knowles & Hennequin, 2004, p. 95). Classroom research has demonstrated the success of the collaborative learning model. For example:
Cooperative learning results in significantly higher achievement and retention than do competitive and individualist learning. [In particular,] cooperative, compared with competitive or individualist [.,] learning tends to result in more higher-level reasoning, more frequent generation of new ideas and solutions (i.e., process gain), and greater transfer from one situation to another (i.e., group to individual transfer). (Johnson, Johnson, & Holubec, 1994, p. 53)

In addition to academic advantages, experience in collaboration helps students build interpersonal skills which will help them be more effective in jobs and professional situations after graduation. It can help students work and relate more effectively with persons who have different skills and backgrounds as different members of a team equally share responsibility for the success of the group (Knowles & Hennequin, 2004). Collaborative learning offers students important benefits, enhancing their learning while in school and helping to build additional skills for future success.

Web 2.0

Advances in communication and educational technology are accelerating along with growing interest in the differences between a teaching-centered approach to education and a learner-centered approach. In this increasingly communications-centered period, one of the most fundamental resources for communication, the Internet, and more specifically, the World Wide Web, is undergoing a significant change according to many experts. The “New” World Wide Web is referred to as a “Semantic Web” (Siemens), the “Read/Write Web,” or “Web 2.0.” Although a common definition of Web 2.0 has not been agreed upon, several characteristics are present. In Web 2.0, the World Wide Web is
no longer primarily a place that holds static Web pages; that is, it is no longer a “medium” that people come to. This first stage of the World Wide Web is frequently called “Web 1.0” and characterizes the first 10 years of the World Wide Web experience as one of going to primarily static Web pages, although some sites did have a minimal amount of interactive capabilities. Web 2.0, however, can be thought of as a “platform” that enables or delivers Web based services to users, frequently independent of the computer that they use. Essential characteristics of Web 2.0 include:

1. There are no “walled gardens;” that is, information freely flows in and out of Web services.
2. There is a rich user experience and data organization.
3. There are significant social aspects; that is, services and characteristics that support and enhance interaction among users.

Web 2.0 in Education

Use of Web 2.0 services in education offers significant support for effective change from a teacher or institution focused instructional approach to learner centered education. Another advantage is that many of the Web 2.0 services enable students to produce content for larger audiences than just a teacher or a class, and produce content in more meaningful ways. Web 2.0 services can facilitate collaboration, and collaboration is a characteristic of the Net Generation or Millennials, persons born between 1982 and 1995, the generation presently going through most levels of K-16 education. For this generation, online spaces are considered “places.” Educators from other generations need to understand this concept and perception by the Net Generation to use the Web most
effectively. In the Web 2.0 learning environment, there is a different role for the teacher, one that has been described in constructivist education as the “guide on the side.” The teacher or educator serves more as a “news master” than a “newscaster”—that is, a person who manages a flow of information rather than being a person who is a source of information. The educator helps provide the tools that students use to create the content. And finally, the use of online learning spaces has the potential to help integrate learning more naturally into students’ lives by using the tools and resources they already use in the places where they use them.

The growing use of Web 2.0 Web services in learners’ personal lives is likely to lead to demands for new learner-centered approaches to education. Richardson wrote about teachers and teaching in the new paradigm:

It’s not so much about the tools. It’s about the information we can connect to using the tools. Provided we have access, we’re not the best source of knowledge in our subjects any longer. We’re no longer the only teachers our students can have on a particular subject. We’re not the only audience for our students’ work. We’re no longer limited by the four walls of our classrooms. And we’re moving toward a time when collaboration will be central to our practice. All of this requires that we cede much of the control over learning to our students, that we act more as connectors to relevant information than distributors of it, that we model the effective consumption and creation of content, and that we focus on the basic skills and ideas of our disciplines in the context of a more individualized, inquiry based model that develops passionate, or as Alan November calls them,
“fearless” learners. . . . In a connected world filled with an overwhelming amount of information and sources, good teaching will be as important as ever to help students make sense of it all and to help them become independent lifelong learners. (Richardson, 2005, ¶ 2, 4)

Wikis: Online Collaboration Tools

One of the “new” online software resources that is an effective tool for collaboration, in education as well as other environments, is the “Wiki.” Although the first Wiki was developed in 1995, many educators began looking at Wikis in 2004 and 2005 as experimentation with Web 2.0 services was started by some teachers and educational technologists. Leuf and Cunningham (2001) defined a Wiki as “a freely expandable collection of interlinked Web ‘pages,’ a hypertext system for storing and modifying information—a database, where each page is easily editable by any user with a forms-capable Web browser client” (p. 14). Probably the best-known Wiki, Wikipedia is a fully collaborative online encyclopedia created and edited by private individuals with knowledge of various subjects, not a work created and edited exclusively by professionals. Unlike, for example, Encyclopaedia Britannica, content is posted by individuals, with the expectation that the accuracy of the information will be checked by other individuals with knowledge of that field. There are no professional editors and fact-checkers which a conventional reference source would utilize. A defining characteristic of Wikipedia is that anyone can post and edit the information it contains. In reality, some basic controls of posting and editing have been instituted since late 2005 because of cases
of falsification of information about some public individuals or organizations. For the most part, though, *Wikipedia* remains an open, collaborative online publication.

Lamb (2004) cautioned, however, that Wikis are not all the same. “In practice, the term *Wiki* is applied to a diverse set of systems, approaches, and projects” (p. 38). Even though variations are found among different Wiki programs and applications, Lamb identified some fundamental principles which usually apply to Wikis:

- **Anyone can change anything.** Wikis are quick because the processes of reading and editing are combined. The signature of a Wiki is a link at the bottom of the page reading “Edit text of this page” or something similar.
- **Wikis use simplified hypertext markup.** Wikis have their own markup language that essentially strips HTML [Hypertext Markup Language] down to its simplest elements. New users need to learn a few formatting tags, but only a few.
- **WikiPageTitlesAreMashedTogether.** Wiki page titles often eschew spaces to allow for quick page creation and automatic, markup-free links between pages within (and sometimes across) Wiki systems. Linking to related pages is easy, which promotes promiscuous interlinking among Wiki pages.
- **Content is ego-less, time-less, and never finished.** Anonymity is not required but is common. With open editing, a page can have multiple contributors, and notions of page “authorship” and “ownership” can be radically altered . . . for the most part, Wikis are in a constant state of flux. Entries are often
unpolished, and creators may deliberately leave gaps open, hoping that somebody else will come along to fill them in. (Lamb, 2004, p. 38)

With their inherent openness, accessibility and relative ease of use, Wikis can potentially benefit learners by facilitating collaborative work in instructional activities, as well as provide experience in collaboration that can be transferred to work environments and other situations which increasingly involve interaction and cooperation among persons in local settings and, indeed, globally through Internet communication.

**Statement of the Problem**

Because of the increasing amount of collaborative activity in a wide range of professional organizations and work situations, especially in creative environments such as the communications industry, students need training in effective collaboration techniques. Most of today’s students and recent graduates, however, have been educated in schools and systems that are based on individual assessment and achievement. Most students and young adults have not learned critical collaborative skills. Many implementations of active learning and constructivism have used collaborative approaches, but this type of learning has been the exception in most students’ educational experience. Relatively new collaborative software programs called Wikis provide powerful tools to help students collaborate on educational projects. Not only can Wiki-based projects provide experience in collaboration among students, but as online-based computer programs they enhance students’ applied knowledge by offering additional practical experience with a type of collaborative communication software likely to be used in professional settings they will encounter after graduation.
Through this study, we seek to gain a better understanding of effective use of online collaborative software by students and faculty in higher education to improve student learning; expose learners to new software-based approaches to collaboration and problem-solving; and better understand obstacles to effective, interactive collaboration among students who have been raised in an education system oriented toward individual, not group, assessment.

Research Questions

1. What benefits to collaboration do students experience in face-to-face class assignments?

2. What obstacles to collaboration do students experience in face-to-face class assignments?

3. What benefits to collaboration do students experience when using an online Wiki for class assignments?

4. What obstacles to collaboration do students experience when using an online Wiki for class assignments?

5. Is there a difference between Wiki group collaboration and non-Wiki group collaboration in terms of the quality of the final product?

6. Is there a difference in students’ experiences of learning and sense of community after Wiki-based collaboration and face-to-face collaboration assignments?

Significance of the Study

Many older members of the Net Generation are in college or have recently completed college. This generation has grown up in a “digital society” in which they
have always known, or known about, computers, even though their access has varied. Use of technology is a natural part of their lives, with digital devices easily integrated into their activities. By investigating undergraduate college students’ use of online collaboration tools, we can have a better understanding of how to implement education effectively for the new generation, and assist in moving from a teaching-centered to a learner-centered approach to education.

Definition of Terms

Collaboration: the action of two or more people working together to create something—a concept, a discussion, an essay, a classroom technique (Fakler & Perisse, 2004).

Collaborative Learning: an instructional approach in which students work together in small groups to accomplish a common learning goal (Davidson, as cited in Paoletti, Sies, Jenkins, 2004).

Cooperative Learning: small groups of students working together to maximize their own and each other’s learning. Essential elements include positive interdependence, interaction, individual accountability, interpersonal skills, and group processing (K. A. Smith, 1996).

Electronic Collaboration: a process that connects individuals electronically via the Internet to work together on an intellectual, academic, or practical endeavor (Koufman-Frederick, Lillie, Pattison-Grodon, Watt, & Carter, 1999).

Engagement: the extent to which students participate in empirically derived good educational practices and what they gain from their college experience (Kuh, 2001).
**HTML:** Hypertext Markup Language. The language used to create a page for the Internet. The commands enable users to specify different fonts, graphics, hypertext links, and more (B. Williams, 1999, p. 301).

**Read/Write Web:** original concept by Tim-Berners-Lee, founder of the World Wide Web, of the Web as a collaborative online medium where people meet and read and write (Richardson, 2006).

**Social Networking:** the use of a website to connect with people who share personal or professional interests, place of origin, education at a particular school, etc. (Webster’s New Millennium™ Dictionary of English).

**Semantic Web:** a mesh of information linked up in such a way as to be easily processable by machines, on a global scale. You can think of it as being an efficient way of representing data on the World Wide Web, or as a globally linked database (Palmer, 2001, What is the Semantic Web? Section, ¶ 1).

**Web 2.0:** the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an “architecture of participation,” and going beyond the stage metaphor of Web 1.0 to deliver rich user experiences (O’Reilly, 2005, ¶ 2).

**Web Services:** Web-accessible programs and devices (Alesso & Smith, 2005).
Wiki: a freely expandable collection of interlinked Web “pages,” a hypertext system for storing and modifying information—a database, where each page is easily editable by any user with a forms-capable Web browser client (Leuf & Cunningham, 2001).
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

At its root, this technological revolution puts learning and education on a collision course. The essence of education is *instruction*—something some people do to other people, usually with required “discipline.” The word *pedagogy* comes from a Greek verb meaning “to lead,” and *education* itself is from the Latin word meaning “to lead forth”—both imply the active leader herding a flock of passive followers. But the essence of the coming integrated, universal, multimedia, digital network is *discovery*—the empowerment of human minds to learn spontaneously, without coercion, both independently and cooperatively. The focus is on learning as an action that is “done by,” not “done to,” the actor. (Perelman, 1992, p. 23)

The advent of digital networks has signaled much more than the growth of technological networks. Digital networks have generated new work practices, new social connections, structures and communities. The rise of networks, both as material, technical and social artifacts, and as a way of understanding processes—as the dominant metaphor for our time—has brought with it some serious challenges to conventional structures that shape most areas of work and education. (Bruns & Humphreys, 2005, p. 1)
Through use of advancing technology, pedagogy and adragogy (the art and science of helping adults learn), we are in the early stages of a revolution in education and learning. The principles and practices of new educational approaches are being applied by established, conventional educational institutions as well as a growing number of newly-established education and training organizations. Social communication technologies and services are increasingly integrated in learners’ lives and have started their initial implementation in educational settings at all levels.

Communication Cultures

Historically, educational methodology has changed to reflect the predominant methods and resources of communication in a given society. Dulles (1971) has divided human history into four major cultural periods, based on the dominant communications characteristics of the time. The first period is Oral Culture in which oral communication—the spoken word—was primary. The second period was the Manuscript Culture which reached its peak during the Middle Ages. Using the limited number of hand-copied manuscripts as their basis, government and religious leaders communicated laws and teachings to the illiterate masses. Theologians communicated religious beliefs through “a great variety of media: homilies on the inspired books, liturgical action, sacred chant, mystery plays, church architecture, stained glass windows, statuary and painting” (p. 8). The communications revolution of the 16th century was brought about by Gutenberg and the printing press, marking the beginning of the third culture—the Print Culture. The rate of literacy rose significantly as affordable translations of the Bible and other books became available.
Dulles (1971) then addressed the present “electronic age” as a significant new communications-based culture:

The communications revolution through which we are passing is fully as radical as that of the sixteenth century. The electronic media are molding a new world and perhaps even a new breed of human being. In the opinion of Marshall McLuhan, the “hot media” of typographical culture lend themselves to the amassing of information, the classification of data, logical synthesis and “vehement assertion of private outlook” (McLuhan, 1966, p. 21). The contemporary electronic culture, however, is characterized by “cool media”—media that communicate by inviting personal participation, depth of awareness, a sense of wholeness, immediacy and the thrill of discovery. (p. 11)

The “electronic age” has developed more rapidly than any other communications age, fueled by rapid developments in digital technology. By the end of the 20th century, the term Digital Culture was being used to describe the new communications culture which was becoming increasingly dominant in societies throughout the world.

The “culture” of education has been primarily print-based for the past 400 years, while Multimedia/Digital Culture had seen its rate of development increase during the past three decades. As technology expands Digital Culture resources, we are in the midst of a social transition that brings both opportunity and challenge as education, business, government, and, indeed, virtually all social relationships are likely to be affected.
The New Learners

Tapscott (1998) addressed the need to use different approaches in education with the members of the new generation, which he referred to as the Net Generation, or N-Gen. He says that the field of education historically has been oriented toward models of learning that focused on “instruction”—what he calls broadcast learning (p. 129).

The term teacher implies approaches to learning where an expert who has information transmits or broadcasts it to students. Those students who are “tuned in” take the information they are “taught”—i.e., which is transmitted to them—into active working memory. . . . The product of this is certain outcomes and behaviors—which, in turn, can be measured during testing.

The lecture, textbook, homework, assignment, and school are all analogies for the broadcast media—one-way, centralized, and with an emphasis of predefined structures that will work best for the mass audience. (Tapscott, 1998, p. 129)

Tapscott (1998) called for implementation of a new paradigm in learning, one in which new technologies enable and will meet the learning needs of N-Gen. The new paradigm is a shift from broadcast learning to “Interactive Learning” (p. 139). Educators and students can shift to more powerful Interactive Learning by exploiting the digital media. Figure 1 outlines the shift from broadcast to interactive learning in eight key areas.
Broadcast Learning | Interactive Learning
---|---
Linear, Sequential/Serial | Hypermedia Learning
Instruction | Construction/Discovery
One size fits all | Customized
Absorbing Materials | Learning How to Learn
School | Lifelong
Teacher-centered | Learner-centered
School as Torture | School as Fun
Teacher as Transmitter | Teacher as Facilitator

*Figure 1.* The shift from broadcast to interactive learning (Tapscott, 1998)

Prensky (2001) stated that “today’s students are no longer the people our educational system was designed to teach” (¶ 36). Today’s learners participating in traditional K-16 education are members of a generation referred to as Millennials or the Net Generation. There are currently five living generations: Matures, born through 1946; Baby Boomers, born 1947 through 1964; Gen X-ers, born 1965 through 1980; Millennials, born 1981 through 1994; and Post Millennial, born since 1995. Adults presently participating in distance education generally come from the Baby Boomer or Generation X segments. But educating the Millennials who are currently participating in the traditional educational levels K-16 and beyond in ways that recognize their experience, learning styles, and preferences will have beneficial effects for everyone participating in education.
Howe and Strauss (2000) identified characteristics of Millennials that point to a need for new approaches to leading and educating this new generation. Highlights of their findings include:

1. Collaborative learning is popular with Millennials. Kids do projects and are often graded in groups.
2. Increasing computer use among all teens and the use of beepers and cell phones suggest Millennials spend time tracking down and communicating with friends and family.
3. Millennials appear more teamlike. “Millennials have stepped into a teen world with little cohesion, decided they don’t like it that way, and are trying to turn it around” (p. 180).
4. “Millennial teens are hard at work on a grassroots reconstruction of community, teamwork, and civic spirit” (p. 214).
5. Millennials are adept at high tech research skills and using this research in real life.

A gap exists between educators and today’s students. Prensky (2001) referred to Digital Natives and Digital immigrants. “Today’s students are ‘native speakers’ of the digital language of computers, video games, and the Internet. They process information and act differently than previous generations. Digital immigrants have had to adapt; their ‘accents’ are discernible” (Prensky, 2001, ¶ 11). In other words, older generations interact with technology in a more deliberate way rather than the “natural” way that technology is embedded as part of the lives of the Net Generation. Hartman and Roberts (2005)
reported that the Net Generation’s technology-literate students have rising expectations which often are difficult for many educational institutions and organizations to meet. In terms of the service the Net Generation expects, Amazon.com, eBay, and Google are their models. They expect immediacy, self-service, and customization. Students want engaging learning experiences. And students’ satisfaction levels with technology used in learning are decreasing even while their achievement scores are significantly increasing compared to previous generations (Dziuban & Maskal, 2005). General characteristics of the Net Generation include: they are always connected, multi-tasking, resourceful, inquisitive, like to customize, and are both independent and interdependent (Hartman & Roberts, 2005). Learning expectations of the Net Generation recognize that good teaching is universal. The characteristics of good teaching include: good teaching engages students in the subject matter; it has the ability to communicate effectively; it includes participatory learning (integrating secondary sources to foster a better understanding); and good teaching includes fair treatment of students. The Net Generation’s students enjoy courses where the professor has an equal amount of traditional lecturing as well as interactive learning. Interactive learning may be defined as a group project, working as a team for a particular in-class assignment, watching video clips, using PowerPoint®, or accessing course material via the Internet (Hartman & Roberts, 2005). Given the choice, Net Gen students would like to have access to smart classrooms and flexible learning spaces. They would prefer to use items such as PDAs (Personal Digital Assistants), cell phones, and laptops in the classroom. The defining characteristic of the Net Generation is the constant need to be connected. Internet services
(AIM, Facebook, etc.) help them stay connected. Multi-tasking allows Net Geners to communicate with numerous friends when trying to plan an event (Hartman & Roberts, 2005).

Effective and appropriate use of technology, both in traditional and distance education and learning, will benefit not only the Net Generation, but also learners from older generations. There is an increasing gap between the tools and resources that are deployed by most current educators and those selected and used by Net Gen students in their lives. There is a gap between educators and the Net Generation in regard to the way these digital tools are used (Hartman & Roberts, 2005).

Since information, resources, and people with knowledge about subjects of interest to learners are, by and large, not physically present at the same time and the same place with the learner, through Internet and World Wide Web technologies and applications, learners experience an increasing amount of their education and learning through technologies in ways that are characteristic of elements of the classic definition of distance education. Considering the rapid rate of technology development and social and educational characteristics of the Net Generation, the adoption of new World Wide Web—Web 2.0—technologies to meet the demands of today’s learners are also likely to extend to the education of older generations, especially those engaged in online distance education.
Education and Technology

Technology plays a significant role in the development and implementation of education. Bates (1984) described four major trends resulting from developments in technology:

1. A wider range of media is now becoming available for use in the home.
2. There is a greater diversity of access to new media.
3. Costs are coming down for new media.
4. New media are giving students greater control over their learning and greater interaction. (pp. 5-6)

As developments in technology continued at an accelerating pace through the 1980s, 1990s, and the beginning of the new millennium, these four trends continue to have an effect on both traditional face-to-face education and on distance education.

Hypermedia

A major technological development used extensively during the late 20th century in both conventional and distance education is hypermedia. As it became more commonplace, not only in education, but increasingly in other areas of the “information society,” researchers began to more fully examine its efficacy. Oliver (1995) discussed hypermedia and its application in education.

Hypertext, or hypermedia as it is commonly called today, is an instructional medium which appears to hold considerable promise for teaching and learning. It manifests itself in many forms, often with quite disparate variances in capabilities. For example, the majority of CD-ROM based information systems such as
electronic encyclopedias are examples of hypermedia systems as are the majority of instructional materials delivered on the World Wide Web. Although different in appearance, scope and form, the unifying characteristics of these computer-based materials are the structure they embrace and the purpose they serve.

Structure. Hypermedia materials are comprised of multiple separate information nodes. These information nodes contain various media forms such as text, sound, graphics and movies either individually or combined. The structure of a hypermedia system enables users to access information from the nodes in a non linear way. Users are able to progress from one node to the next using links supplied by the system designer.

The structure of a hypermedia system is often compared to the human mind which also stores information as discrete nodes with links between those that are related and/or associated.

Purpose. Hypermedia materials are usually designed as information delivery systems. In this role they serve an instructional purpose. While some systems are designed as information sources within which the users are free to browse, others constrain the user to follow paths through the stored information. Such paths are set by the instructional designer and lead the user through the information in the same way as a book presents content to a reader. As purveyors of information, hypermedia systems provide many advantages over paper based forms. They are very flexible and powerful in the way in which information is accessed and provide access to multiple media forms.
The potential of hypermedia as a learning tool is derived from the nature of the learning that it supports. It facilitates student centered approaches, creating a motivating and active learning environment. It supports and encourages browsing and exploration, learner behaviours that are frequently associated with higher order learning. The nature of information organisation in hypermedia appears to closely mimic human memory. Information retrieval methods closely resemble human thought processes. People do not think using indexing and sorting rules but rather in terms of contextual links between information and images. Hypermedia supports and facilitates a very natural and efficient form for information retrieval. (Oliver, 1995, ¶¶ 1-6)

Hypermedia allows for learners with unique intentions and purposes to determine which, and in what order, information will be displayed; potentially configuring what, when, and how learning will transpire. As a result, learners can tailor the educational experience to meet their own unique needs, interests, and goals, many of which emerge while interacting with the hypermedia. This property, that is, the ability to support large amounts of learner control, coupled with the assumption that learner control will have a positive impact on learning, has led many researchers to promote the development and use of more open-ended learning environments—such as hypermedia. (Barab, Bowdish, & Lawless, 1997, p. 37) Early research on hypermedia and learning suggested, however, that not all learners will use hypermedia effectively. Barab et al. provided several examples:
• Lawless and Kulikowich identified a group of *apathetic hypertext users*, referring to navigators who did not use the hypertext to explore its features or to gather information.

• Steinberg found many studies in which users failed to employ effective strategy use and monitoring.

• Other learners might choose to explore the hypermedia, just not the material that the designers of the hypermedia intended users to explore.

• Lawless and Kulikowich found that individuals who were interested in the hypertext features had the lowest scores on postachievement questions.

• Researchers discussing hypermedia users have continually expressed concern regarding the potential disorientation of users.

• Relatively less discussion has centered on user goals and intentions for using the hypermedia, and how these goals can be stimulated and maintained, influencing individuals to move beyond superficial browsing to really explore and learn. (pp. 37-38)

Hypermedia, by providing common access to text, visual, and/or audio materials, allow the instructional designer to utilize the best medium or combination of media to present concepts being taught. Hypermedia can be learner centered, permitting a learner to control a significant amount of his or her learning process.

The Internet and World Wide Web

Perhaps the most significant technology affecting not only education but societies at large in both the developed and developing world is the Internet and the World Wide
Web (WWW). First operational in 1967, the Internet was used primarily by the government, universities and some commercial organizations during its early years. Since the introduction of the World Wide Web in 1991, individuals and organizations of different types have been using global networking capabilities on an ever-expanding scale for economic, educational, and social interactions. Through the hypermedia environment of the World Wide Web, the Internet is integrating itself into individuals’ and organizations’ lives at an ever-accelerating rate. We now consider several key aspects of this global networking and distance education.

According to Lefrere (1997), there are two main advantages to the Internet:

1. It combines advantages of other media so that it conveys video and sound better than a book, is more interactive than a videotape, and, unlike a CD-ROM, can link people from around the world cheaply.

2. It can also be a content provider. The Internet is, arguably, the largest and most diverse information resource in the world today. It is possible to incorporate the wealth of information available on the Net in your design [of instruction]. For instance, if you are designing a module on Renaissance art history, you can include links to the Vatican library and the Louvre, as well as to the art history exhibit of the Australian National University. (pp. 11-12)

Whereas our society’s economic foundation has been changing from an industrial-based economy to an information economy, there is growing awareness that we are moving into what is often referred to as the Knowledge Age. Stutt and Motta (1998)
described the World Wide Web as a “metonym for the Knowledge Age” (p. 213). They wrote:

The Web can be conceived both as a locus where the boundaries between real and virtual, human and artificial, are dissolved and as a medium for the transmission and collaborative construction of artefacts [sic] embodying hybridized knowledge forms. Thus, it can be taken to exemplify (i.e., it provides a metonym for) the Knowledge Age. The following are the main ways in which the Web can be viewed as epistemified:

- it acts as a distributed repository of data, opinion and knowledge;
- it serves business, education and the research community as a two-way channel for the flow of information, opinion, argumentation, software and other commodities;
- as a two-way channel it can be used as a communicative tool in the collaborative construction of arguments, research papers, software, buildings;
- it is populated by epistemic agents: spiders, bots, search engines;
- it serves as a forum for the mediation between multiple intelligent agents (whether software or human);
- it is itself an intelligent entity, adaptive, evolving. (p. 213)

By utilizing hypermedia, the World Wide Web brings together people and resources which enable effective interactions between and among people regardless of time and place. S. Davis and Botkin (1994) wrote
A new meaning of education and learning is bursting on the scene in America. . . .

The marketplace for learning is being redefined dramatically from K-12 to K-80, or lifelong learning, whose major segments are customers, employees, and students, in that order. (p. 16)

Although great strides have been made in a relatively short period, we are only beginning to utilize converging information technology and global networking in ways that will inevitably have a profound effect on education and learning throughout the world. Distance education has a primary role in the learning revolution.

Web 2.0

The introduction of the first Mosaic web browser in 1993 marked the beginning of a new method of navigating the Internet and the World Wide Web. Referring to the first phase of World Wide Web implementation as “Web 1.0,” Clinton (2005) wrote:

Though it reached its peak in less than ten years, the era of Web 1.0 will be long remembered as a turning point in human society. As we are still deep in the midst of all of the change it is easy to overlook just how profound the Internet revolution really is.

Web 1.0 was the great equalizer. It put everyone on the same playing field. A single individual sitting at a computer in the remotest region of the globe has the ability to publish as easily and as widely as the largest newspaper. (The Past section, ¶¶ 5-6)

Clinton (2005) characterized the technology of Web 1.0 as both ground-breaking and “surprisingly traditional” at the same time. It was ground-breaking because it reduced
data distribution costs to almost nothing, but was traditional in the sense that, generally, it followed the model of the printing press, allowing a producer of information to reach potentially millions of consumers.

“Web 2.0” is a term used to describe a second phase of the World Wide Web which enables developers “to create web sites that look and can act like desktop programs. Web 2.0 [sites] are driven by databases, encourages [sic] interaction between users” (McFedries, 2006, p. 68). McFedries identified Wikis as examples of collaborative Web 2.0 web sites in which users are allowed to delete, edit, and add content. Web 2.0 refers to “the transformation of the original Web of static documents into a collection of pages that still look like documents but are actually interfaces to full-fledged computing platforms” (Roush, 2005, p. 49).

Fleenor and Rego (2005) discussed new knowledge management tools available on this “new Internet” as tools that facilitate organizational transactions as well as help in the accomplishment of specific leadership tasks. They include Wikis, Weblogs, and Really Simple Syndication (RSS) as three examples of these online tools.

Siemens wrote that “over the last twenty years, technology has reorganized how we live, how we communicate, and how we learn” (2005, p. 3). To reflect more accurately the approach to learning needed at a time when knowledge changes quickly and persons are likely to have several different jobs during their working life, he proposed a new theory called connectivism.

Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs
Within nebulous environments of shifting core elements—not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing.

Connectivism is driven by the understanding that decisions are based on rapidly altering foundations. New information is continually being acquired. The ability to draw distinctions between important and unimportant information is vital. The ability to recognize when new information alters the landscape based on decisions made yesterday is also critical.

1. Principles of Connectivism:
   - Learning and knowledge rests in diversity of opinions.
   - Learning is a process of connecting specialized nodes or information sources.
   - Learning may reside in non-human appliances.
   - Capacity to know more is more critical than what is currently known.
   - Nurturing and maintaining connections is needed to facilitate continual learning.
   - Ability to see connections between fields, ideas, and concepts is a core skill.
   - Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality.

While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (Siemens, 2005, p. 7)

Because of its networked foundation and interactive characteristics, Web 2.0 is a valuable platform for implementing the principles of connectivism in both distance and classroom education.

Palmer (1998) discussed two models of learning which can be adapted to illustrate differences between traditional and distributed approaches to learning. The first model (see Figure 2) represents the top-down approach to education which has been typical of our educational system and process. An Expert—in education, a Teacher—is presumed to have all the knowledge about an object and passes that knowledge to “Amateurs” or learners. It is a one-way process.

The learning environment illustrated in Figure 3 reflects the principle that knowledge about a subject is distributed among different persons, and learning environments and systems should be created in which the participants share their individual knowledge of and experience with the subject to provide deeper knowledge and understanding of that subject.
Figure 2. Top-down approach to learning
There are many definitions of—and ways to understand—“community.” McMillan and Chavis (1986) defined community as “a feeling that members have of belonging, a feeling that their members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9). Bellah, Madsen, Sullivan, Swidler, and Tipton (1985) defined community in this way:

*Figure 3. Knowledge distribution among persons*
A community is a group of people who are socially interdependent, who participate together in discussion and decision making, and who share certain practices that both define the community and are nurtured by it. Such a community is not quickly formed. It almost always has a history and so is also a community of memory, defined in part by its past and its memory of the past. (p. 333)

Rovai (2002a) stated that definitions of community developed by a number of scholars “suggest the most essential elements of community: mutual interdependence among members, sense of belonging, connectedness, spirit, trust, interactivity, common expectations, shared values and goals, and overlapping histories among members” (p. 4).

Robert Putnam (2000) has studied American civic and social life, describing significant decline in group-oriented places, activities and relationships. Freie (1998) wrote about a growing longing for connectedness among people. Critiquing many contemporary community-building activities, he discussed what he called counterfeit community as it has become manifest throughout contemporary American society—in housing, as it shapes our public spaces, in the workplace, in politics, in religion, and most recently, in cyberspace. Rheingold (1994) pointed to both possibilities and limitations of the online environment to establish and nurture community. The lived experiences of others, however, demonstrate the community-building potential of online communications.

Community in education is a strong asset to learning. Cannell (1999) addressed the formation of learning communities:
Obviously, it is a mystery as to how community is formed in classrooms. The fact of a classroom does not guarantee community any more than a distance learning chat room will. Vital elements in the formation of learning communities seem to be: people who assume responsibility for their own learning and who ground their learning in social contexts. Participation is essential—people must share ideas and values, reflect mutually on experience, form learning partners and cohort groups, even in cyberspace. Attention must be given to the quality of interaction. Facilitation will be required to move the interaction beyond chat to engagement.

Community is formed in the interaction of persons with common interests and values. Interpersonal proximity, though desirable, does not eliminate the possibility of the learning community when learners are at a distance . . . The concept of the community may broaden to include resources from outside the school—based on a network of scholars and other support persons. (pp. 20-21) The importance of building learning communities has been a significant topic for educators in recent years. Palloff and Pratt (1999) pointed out that:

The principles involved in the delivery of distance education are basically those attributed to a more active, constructivist form of learning—with one difference: *in distance education, attention needs to be paid to the developing sense of community within the group of participants in order for the learning process to be successful.* The learning community is the vehicle through which learning occurs online. Members depend on each other to achieve the learning outcomes for the course. (pp. 28-29)
Community is based on interactions. As Palloff and Pratt stated, “Key to the learning process are the interactions among students themselves, the interactions between faculty and students, and the collaboration in learning that results from these interactions” (p. 5). While there is interest in learning communities in a variety of educational settings, learning communities are essential in distance learning.

Collaboration and the Construction of Meaningful Knowledge

In his discussion of the Read/Write Web—the interactive web—Richardson (2006) pointed out the implications for educators of interactive application programs and web-based services:

For generations, the typical expectation of our students has been that they work independently (“do you own work”) and produce that work or content for a limited audience, usually just the teacher giving the grade and perhaps the other students in the class. The work, once it was finished, was exactly that...finished. Think of how few opportunities there were for anyone outside the classroom walls to “read” those efforts, whether they were essays or experiments or projects or performances. Think of how much of student work today simply ends up in the recycling bin at the end of the year.

Today, however, the Read/Write Web makes it easy for students to produce work in truly collaborative ways for large audiences. That work can have real purpose and real meaning for the audience that reads and consumes it. Information created and published in this way takes on a new social context that requires us to change the way we think about what we ask our students to
produce, not as something to be “finished” but as something to be added to and refined by those outside the classroom who may interact with it. (pp. 126-127)

Collaborative and Cooperative Learning

B. L. Smith and MacGregor (1992) described “collaborative learning” as an umbrella term for a variety of educational approaches involving joint intellectual effort by students or students and teachers together.

In most collaborative learning situations, students are working groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. There is a wide variety in collaborative learning activities, but most center on the students’ exploration or application of the course material, not simply the teacher’s presentation or explication of it. Everyone in the class is participating, working as partners or in small groups. Questions, problems, or the challenge to create something drive the group activity. Learning unfolds in the most public of ways. (p. 10)

According to Bruffee (1992), the term “collaborative learning” was coined and the basic idea first developed in the 1950s and 1960s by a group of British secondary school teachers and by a biologist studying British post—graduate education—specifically medical education. It began to interest college teachers in the United States on a wider basis starting in the 1980s. He stated that the roots of collaborative learning in higher education in the United States go back to the need identified in the early 1970s to better-equip college students for success in higher
education. Various approaches to teaching and learning were implemented, including several types of collaborative learning.

What distinguished collaborative learning in each of its several types from traditional classroom practice was that it did not seem to change what people learned (a supposition that now seems questionable) so much as it changed the social context in which they learned it. Students’ work tended to improve when they got help from peers; peers offering help, furthermore, learned from the students they helped and from the activity of helping itself. Collaborative learning, it seemed, harnessed the powerful educative force of peer influence that has been—and largely still is—ignored and hence wasted by traditional forms of education. (p. 25)

Collaborative learning takes place in a variety of different forms, disciplines, and academic settings. While the implementations may be different, collaborative learning is based on a number of important assumptions about learners and learning process: (a) Learning is an active, constructive process; (b) learning depends on rich contexts; (c) learners are diverse; (d) learning is inherently social; and (e) learning has affective and subjective dimensions (B. L. Smith & MacGregor, 1992, pp. 10-11).

Bruffee (1992) addressed the common use of collaboration in different fields as an important reason to include collaborative learning in education:

In business and industry, furthermore, and in professions such as medicine, law, engineering, and architecture—where to work is to learn to fail—collaboration is
the norm. All that is new in collaborative learning, it seems, is the systematic application of collaborative principles to...the American college classroom. (p. 30)

K. A. Smith, Johnson, and Johnson (1992) identified several types of cooperative learning groups that can be applied in almost all types of classes:

1. Informal learning groups which are short-term and less structured; and can be used in any class size, but are especially useful in larger classes to help focus students’ attention prior to the lecture, to break up the lecture and provide the students in chance to review and check for understanding, and to summarize the main points at the end of the lecture.

2. Formal cooperative learning groups are small (2-4 member) groups formed by the professor, often randomly, to do a specific jobs such as review homework, work through problems together, review for a test, perform a lab experiment and write a report, or conduct a design project. Formal cooperative learning groups are groups that must work together to create a final product.

3. Base groups are long-term, small (3-5 member) groups with stable membership whose primary responsibility is to provide support, encouragement, and assistance in learning the material and completing the assignments. Base groups tend to improve attendance and help to make learning more accessible in lecture-size classes. The larger the class and the more complex the subject matter, the more important is to have base groups. (pp. 35-36)
Fiechtner and Davis (1992) conducted a survey of 155 students enrolled in several upper division classes at two major southwestern United States universities. Through questionnaires, they surveyed the students’ opinions about their classroom group experiences. They asked the students to indicate the title of the courses in which they had their most positive and least positive classroom group experiences, and respond to 14 closed-end items used to collect data on the composition of the groups, the grading system, and the nature of the classroom activities in graded assignments. The survey also contained three open-ended items that asked students what they thought was the most important reason that the learning groups worked better in one class than another and what they felt were the most positive and most negative aspects of working with classroom groups.

In their study they found that students were most likely to have positive experiences in classes where groups were either formed by the instructor or by a combination of methods implemented by the instructor. The classes with the worst group experience tended to use groups formed by the students themselves. The study also indicated that groups consisting of 4-7 members tended to do well. Smaller groups lacked the necessary resources, and in larger groups it was difficult to manage cohesiveness. Collaborative groups were most successful when they were permanent, heterogeneous groups formed by the instructor. To be most successful, there should be a reasonable number of graded group activities that account for a percentage of the total course grade somewhere between 20% and 60%.
Social constructive pedagogical models which consider knowledge as a social construct “had made collaborative learning a more widely accepted means to encourage active, authentic, student-centered learning” (Knowles & Hennequin, 2004, p. 95).

Classroom research has demonstrated the success of the collaborative learning model. For example:

Cooperative learning results in significantly higher achievement and retention than do competitive and individualist learning. [In particular,] cooperative, compared with competitive or individualist[,] learning tends to result in more higher-level reasoning, more frequent generation of new ideas and solutions (i.e., process gain), and greater transfer from one situation to another (i.e., group to individual transfer). (Johnson et al., 1994, p. 53)

Oxford (1997) distinguished among three types of learning communication in the classroom: (a) cooperative learning, a particular set of classroom techniques that foster interdependence leading to cognitive and social development; (b) collaborative learning, which views learning as a construction of knowledge within a social context; and (c) interaction, which refers to personal communication. K. A. Smith (1996) described cooperative learning as the use of small student groups as teams to accomplish a common goal, emphasizing positive interdependence, individual and group accountability, face-to-face interaction, team skills, and group processing.

Cooper and Mueck (1992) identified several critical features that distinguished cooperative learning from other forms of team learning:
1. Perhaps the most characteristic feature of cooperative learning is positive interdependence; that is, all members of the learning team are responsible for the learning of other members. Thus, in most cooperative learning classrooms, all members of the team work together to produce a common product.

2. A second critical feature of cooperative learning is individual accountability. In cooperative learning, formal rules prohibit either members of the group dominating or “sandbagging” in the group.

3. A third feature of cooperative learning is the appropriate assignment of students to learning teams. Generally such grouping is heterogeneous, based on race, sex, prior achievement, and/or other characteristics determined by the instructor.

4. In cooperative learning, the teacher designs learning activities and monitors the groups as they are engaged in team learning. Rather than functioning solely as an expert, dispensing knowledge to students, the teacher in cooperative learning serves as facilitator.

5. A fifth feature of cooperative learning is its explicit attention to social skills. The students are required to cooperate with one another and are often given explicit rules and guidelines for appropriate social skills.

6. Another feature of cooperative learning is face-to-face verbal problem solving, which holds advantages for both skilled and less skilled students. Good students benefit from serving as tutors to other members of the group;
less proficient students receive diagnostic and remedial help from their teammates. (pp. 68-69)

Lee, Ng, and Jacobs (1997) stated that cooperative learning is more than just groupwork. Unlike traditional group learning in which students work in groups with no attention paid to group functioning, in cooperative learning group work is carefully prepared, planned, and monitored. Four key thinking strategies in cooperative learning are problem solving, decision making, critical thinking and creative thinking. Cooperative learning can support an environment in which students feel encouraged to take part in higher order thinking.

Lizzio and Wilson (2005) studied the domains of process issues that students perceive as relevant to their participation in self-managed learning groups, and how these processes are perceived to influence group outcomes. In the first of their two studies, students evaluated the processes and outcomes of their learning groups, identifying seven process domains: equity and responsibility, cooperation and collaboration, managing differences, task focus, process learning, staff support, and contextual fit. A second study indicated that two process factors were most strongly related to self-reported satisfaction and productivity in this group of students: personal responsibility and collaborative climate, and staff support and environmental fit. The study concluded by stating that “helping students to make their implicit perceptions of process more explicit will enable them to more effectively self-manage their group experience, as well as consciously pursue personal development and process learning agendas” (p. 388).
Cooperative learning has been found to be effective at different educational levels and with different groups of students. D. R. Williams (1995) found that most middle school students preferred cooperative learning to working alone, but that the most appealing aspects of cooperative learning—peer interaction and opportunities for different points of view—may also lead to conflict. In a study of academically gifted middle school students, Ramsay and Richards (1997) found that the gifted students had better overall attitudes toward subjects where cooperative learning was used sparingly, whereas their less academically gifted peers preferred classes with more cooperative learning activities.

Rau and Heyl (1990) examined collaborative learning groups (CLGs) in college classrooms and found that students do better on test material which was discussed in group sessions; that connections to classmates increase significantly; and that in spite of some group problems, the great majority of students found working groups to be effective.

The Florida Community College at Jacksonville Cooperative Learning Project, funded from 1993-1996, focused on changing the culture of the college classroom (Hill, 1996). Faculty members were given several levels of intensive training in cooperative learning strategies and on-going research on cooperative learning resulted in further training. Hill reported that

As a result of this project, the success level of our students was significantly increased. Retention of students in the classroom was increased, critical thinking skills were significantly increased and a sense of community was developed
between and among students and faculty. . . . A student exit survey indicated that students preferred cooperative learning over non cooperative learning. (p. 18)

A specific cooperative learning strategy, team-based learning, was examined by Meeuwsen, King, and Pederson (2005) to determine if this strategy would affect students’ learning styles. This study involved college students in sophomore-level motor behavior courses. The data from the Grasha-Reichmann Student Learning Style Scales used in the study indicated that team-based learning was associated with a significant decrease in negative learning styles and an improvement in a positive learning style.

Cooperative learning has been studied in a variety of subject areas and departments. For example, Walker (1996) found that the cooperative-learning approach used in an upper-division undergraduate course on gender and family relationships enhanced student understanding and improved the quality of the classroom experience for both students and the instructor in a way that was consistent with feminist goals. Cooperative learning has been found to be effective in an introductory statistics course (Keeler & Steinhorst, 1995), general chemistry classes (Dougherty & Bowen, 1995), and in a large lecture physics sequence (Cottle & Hart, 1996). Jackson (1994) evaluated a course developed for Massey University’s (New Zealand) department of information systems that incorporated social and interpersonal skills and cooperative learning to promote higher level thinking skills needed by systems analysts.

Khosravani, Manoochéhri, and Memarian (2005) conducted a study to determine the effects of holding group-dynamic sessions on critical thinking skills of baccalaureate nursing students. The students who participated in the group-dynamic sessions had
significantly higher critical thinking scores than the students who received the routine education program treatment.

Studying the learning process in groups that were given little guidance on how to work effectively, Colbeck, Campbell, and Bjorklund (2000) found that previous class group work and out-of-class experiences contributed to the development of goal, resource, and role interdependence among group members. Agreeing with other researchers, their study concludes that group projects contribute to students’ problem-solving, communication, and conflict management skills.

The Five Stages of Group Development

Perhaps the most frequently cited and applied model of the process of group development was introduced by Bruce W. Tuckman. In Tuckman’s model, groups go through five stages of development: forming, storming, norming, performing, and adjourning. The first four stages were introduced in 1965, with the fifth stage added in 1977. In his 1965 article, Tuckman not only proposed four general stages of group development, but described each stage in both a social or interpersonal realm, and a task realm. “In the social realm, these stages in the developmental sequence are testing-dependence, conflict, cohesion, and functional roles. In the task realm, they are orientation, emotionality, relevant opinion exchange, and the emergence of solutions” (Tuckman, 1965, p. 67).

The development model proposed by Tuckman “was aimed at serving a conceptual function as well as an integrative and organizational one” (1965, p. 78). He summarized the model this way:
Groups initially concern themselves with orientation accomplished primarily through testing. Such testing serves to identify the boundaries of both interpersonal and task behaviors. Coincident with testing in the interpersonal realm is the establishment of dependency relationships with leaders, other group members, or pre-existing standards. It may be said that orientation, testing and dependence constitute the group process of *forming*.

The second point in the sequence is characterized by conflict and polarization around interpersonal issues, with concomitant emotional responding in the task sphere. These behaviors serve as resistance to group influence and task requirements and may be labeled as *storming*.

Resistance is overcome in the third stage in which ingroup feeling and cohesiveness develop, new standards evolve, and new roles are adopted. In the task realm, intimate, personal opinions are expressed. Thus, we have the stage of *norming*.

Finally, the group attains the fourth and final stage in which interpersonal structure becomes the tool of task activities. Roles become flexible and functional, and group energy is channeled into the task. Structural issues have been resolved, and structure can now become supportive of task performance. This stage can be labeled as *performing*. (Tuckman, 1965, p. 78)

In 1977, Tuckman and Jensen added a fifth stage to the development model called *adjourning* (Tuckman, 1984). “Adjourning involves dissolution. It entails the termination of roles, the completion of tasks and reduction of dependency” (Forsyth, 1990, p. 77).
Tuckman and others pointed out that “groups are likely to show significant deviations from the path laid out by stage theories [such as Tuckman’s]. ‘Stages’ may be missed out, other ways of naming a phase or experiences may be appropriate” (M. K. Smith, 2005, Assessment section, ¶ 1). M. K. Smith also pointed out that overlap may occur between stages in some groups’ development, whereas other groups may experience a cyclical or repetitive series of stages.

Cooperative Learning: Students, Teaching, and Assessment

Effective collaborative and cooperative group learning requires substantial role and behavior shifts for students and teachers. MacGregor (1992) identified several of the shifts students have to deal with:

- From listener, observer, and note-taker to active problem-solver, contributor and discussant;
- From low or moderate expectations of preparation for class to high ones;
- From a private presence in the classroom (and few or no risks therein) to a public one, with many risks;
- From attendance dictated by personal choice to that having to do with community expectations;
- From competition with peers to collaborative work with them;
- From responsibilities and self-definition associated with learning independently to those associated with learning inter-dependently;
• From seeing teachers and texts as the sole sources of authority and knowledge, to seeing peers, oneself, and the thinking of the community as additional and important sources of authority and knowledge. (p. 39)

When designing group work, teachers should keep several points in mind to maximize the success of the collaborative work: (a) create group tasks that require interdependence; (b) make the group work relevant to the course objectives; (c) create assignments that fit the students’ skills and abilities; and (d) assign group tasks that allow for a fair division of labor. Other approaches that can improve performance of the groups are to (a) set up “competitions” among groups; and (b) consider offering group test taking (B. G. Davis, 1993).

Gillies’ (2006) research showed that teachers who implement cooperative learning in their classrooms engage in more mediated-learning interactions and make fewer disciplinary comments than teachers who implement group work only. Furthermore, the students model many of these interactions in their groups.

Webb, Nemer, and Ing (2006) examined whether and how students reproduce teacher discourse in four middle school mathematics classrooms using cooperative learning. Their research concluded that that student behavior largely mirrored the discourse modeled by and the expectations communicated by teachers.

Training students in appropriate skills for collaborative learning was investigated by Prichard, Stratford, and Bizo (2006). They examined the effects of team-skills training on collaborative learning in a university setting and found that groups receiving team-skills training had higher scores in the areas tested than participants in the untrained
condition. Results were explained in terms of levels of planning, time management, distribution of effort, and strategies adopted. In their conclusion, Prichard et al. discussed a critical distinction between a group’s product and a student’s individual learning, and potential benefits of team-skill training on individual’s learning:

A danger for collaborative groups is that they may employ strategies that enhance their group product, such as getting the most able member to complete the task on behalf of the group, but consequently fail to enhance their individual learning. The findings from this study suggest that team-skill training supports individual learning to a level beyond that shown by untrained teams. We suggest that training encourages group members to exercise strategies of time management and equal participation which in turn increase learning on the part of an individual student. Teamwork training introduced to the undergraduate curriculum may therefore be seen to go beyond key-skills development and provide preparation for collaborative work that leads to improved individual learning. (p. 263)

As Hendry, Hyde, and Davy (2005) stated, “Teachers and students regulate learning to varying degrees in education programmes in higher education” (p. 672). They examined independently-formed student study groups in a problem-based learning medical program. Results showed there were no differences on students’ scores on a written summative assessment between students who had been in a study group and students who had not been in a study group. They stated that faculty members may support the formation of study groups by pointing out their benefits, but should not force students to join groups since students’ learning styles are different. Teachers can also
support the study group process by using small group teaching/learning activities, providing clear learning outcomes and assessment criteria, minimizing competition for grades, and allocating room space.

Evaluation is an essential component of collaborative and cooperative learning. Since the instructor is not an active participant in each group, and may not even observe much of the group interaction that takes place outside of class, peer assessment is a frequently-used approach to evaluating student group work. Steensels et al. (2006) examined peer assessment conducted twice during a year-long pharmacy practice course. They found a significant correlation between scores given by peers and scores given by external tutors. They also found that the range and standard deviation of the scores given during the second assessment were larger, suggesting a more critical way of rating. They concluded that peer assessment can be a valuable tool to differentiate between student contributions to group work if the students are properly trained to conduct assessments.

Gatfield (1999) investigated the use by 261 university students in Australia of a newly-developed method of peer assessment of collaborative group work. In this method, the instructor marked, or graded, the group projects, and the individuals in the group each received half of the marks of the total awarded. The other half of the grade for each group member was determined by the group members themselves. Each member was evaluated by his or her group peers in five areas of contribution to the group, the scores were averaged by individuals and the group’s peer assessment totals, and a weighting factor was determined by dividing the individual’s Effort Rating by the group’s Average Effort Rating. The resulting score determined the second half of each student’s grade for the
group collaboration project. Gatfield measured the students’ perceptions of the suitability of this assessment method and found a high overall level of satisfaction expressed by the students. Between Australian students and international students primarily from Asian countries, he did find statistically significant differences between groups in four variables, with international students indicating a stronger agreement about peer assessment characteristics. The international students also expressed statistically significant higher satisfaction with the peer assessment method than the Australian students. Another breakdown analysis indicated a statistically significant higher level of satisfaction by students without prior work experience than those with prior work experience. Overall, Gatfield stated that this study provided strong evidence of peer evaluation’s effectiveness in encouraging good group management practices and reinforcing a degree of discipline for students to engage in meaningful cooperative work.

In addition to academic advantages, experience in collaboration assists students in strengthening interpersonal communication skills which will help them be more effective in jobs and professional situations after graduation. It can help students work and relate more effectively with persons who have different skills and backgrounds as different members of a team equally share responsibility for the success of the group (Knowles & Hennequin, 2004). Collaborative learning offers students important benefits, enhancing their learning while in school and helping to build their skills for future success.
Constructivism and Group Collaboration Through Technology

In recent years, there has been a growing understanding and acceptance of a constructivist view of education. Dalgarno (2001) pointed out three broad principles that together define the constructivist view of learning:

1. each person forms their own representation of knowledge . . .
2. learning occurs when the learner’s exploration uncovers and inconsistency between their current knowledge representation and their experience . . .
3. learning occurs within a social context, and that interaction between learners and their peers is a necessary part of the learning process. (p. 184)

There are different interpretations of constructivism which Moshman (1982, cited in Dalgarno, 2001) has divided into three categories:

1. Endogenous constructivism emphasises \textit{[sic]} the individual nature of each learner’s knowledge construction process, and suggests that the role of the teacher should be to act as a facilitator in providing experiences which are likely to result in challenges to learners’ existing models.
2. Exogenous constructivism is the view that formal instruction, in conjunction with exercises requiring learners to be cognitively active, can help learners to form knowledge representations which they can later apply to realistic tasks.
3. Dialectical constructivism is the view that learning occurs through realistic experience, but that learners require \textit{scaffolding} provided by teachers or experts as well as collaboration with peers. (p. 185)
Dalgaro (2001) discussed the implementation of constructivist approaches in different forms of Computer Assisted Learning (CAL), using Moshman’s three interpretations of constructivist theory as a framework to examine effective techniques for learning in computer-assisted environments. Endogenous constructivist materials in CAL include hypertext and hypermedia and hypertext environments in which the learner controls the browsing of content, and simulations and microworlds, allowing the learner to explore within a virtual environment. Exogenous constructivist materials include tutorials with learner control and guided hypermedia, cognitive tools that assist with the strategies of knowledge construction, and practice modules allowing the learner to put their knowledge into practice and receive feedback. In the dialectical constructivist approach which emphasizes the role of social interaction, cooperative and collaborative learning strategies are emphasized. The term Computer Supported Collaborative Learning (CSCL) typically is used to describe technological tools to support this type of learning. CSCL technologies can be divided into three groups: general purpose Computer Mediated Communication (CMC) tools; tools designed for Computer Supported Cooperative Work (CSCW); and those that have features specifically for group learning. (O’Malley, 1995, cited in Dalgaro, p. 190.) Dalgaro included tools to support learner scaffolding in this learning environment.

Xin (1999) investigated computer-assisted cooperative learning in mathematics instruction and found that students in a cooperative learning group had statistically higher achievement scores than those of the whole-class learning group. He studied students in integrated classrooms for students with and without disabilities. Xin’s findings include
desired characteristics of cooperative learning applicable to students with and without disabilities:

When learning situations are structured cooperatively, regular and special education students can work together in pairs or teams. Students support and help each other to encourage themselves to accomplish their learning tasks. They learn to accept different views from their team members, understand, and learn from each other. They also learn to play a role of an active collaborator within teams. This learning experience may motivate students with and without disabilities in their academic achievement and social skill attainment in schools. (p. 76)

In their study of peer assisted learning (PAL) of different age groups of students with disabilities being tutored on writing skills with word processing, Utay and Utay (1997) noted several trends among the learners that reflected positive attitudes and behavior between peers, including the treatment group seeming to enjoy working with their partners, partners asking each other for help before asking a teacher, seemingly committed friendships that continued outside the treatment setting, and an overall improvement in the treatment group’s attitude toward writing.

In her study of post-secondary students learning computer-aided design, Seymour (1994) investigated the effects on achievement levels and student satisfaction of individualistic and cooperative learning strategies in this classroom and lab course. Seymour found there was no significant difference in achievement levels or in student satisfaction levels between cooperative learning structures, individualistic structures, or between cooperative learning structures combined with individualistic structures and
individualistic structures alone. While pointing out there were confounding variables that were not controlled for in the study, Seymour addressed possible reasons why the cooperative and combined treatments did not produce higher achievement and student satisfaction. She discussed observations which were made that most of the students in the study seemed to be extremely grade conscious, appearing more concerned about quiz grades than how the computer or software worked. Conversely, she indicated that students who appeared apathetic early in the study did not appear to be motivated to work within their groups. In her study of undergraduate student life, Nathan (2005) found that university students juggled the many academic and social elements of college life so they could have a full, fun college experience. Concerning course workload, she found that frequently students assess what is needed to get by [or to get a grade they expect] in each class and do only the work necessary to achieve their objective.

Seymour’s (1994) and Nathan’s (2005) observations and findings about post-secondary student performance and motivation suggest that many college and university students will do what is necessary to earn a grade or reach a lifestyle objective, but not necessarily engage in or be concerned about rich learning experiences. These factors, students’ possible lack of interest in group collaboration processes, and the desire to complete academic work efficiently and quickly, may affect collaborative Wiki-based academic experience.

Electronic Collaboration

The Education Alliance is a department at Brown University which has been conducting research and providing resources to help the education community improve
K-16 schooling. In one of their publications, “Electronic Collaboration: A Practical Guide for Educators,” Koufman-Frederick et al. (1999) first defined collaboration as “a process by which people work together on an intellectual, academic, or practical endeavor. In the past, that has meant in person, by letter, or on the telephone” (p. 1). They continued,

Electronic collaboration, on the other hand, connects individuals electronically via the Internet using tools such as email, or through access to sites on the World Wide Web. This Internet-based work allows collaborators to communicate anytime, from anywhere to any place. (p. 1)

Pointing out that electronic collaboration can take many forms, they identified and explained some of the more common activities used:

- **Discussion groups** are focused around a topic or a specific activity, goal or project. Some groups are open-ended and unmoderated, accepting all input from group members, while other online discussion groups may use a moderator to guide the discussion by filtering and posing questions, and/or making comments, suggestions and connections.

- **Data collection and organization** activities use databases and search engines to organize and retrieve data. Users contribute data to a shared database and retrieve it as needed. Data can be in the form of references, information, curriculum projects, research papers, and contact information for colleagues.

- Some projects involve **sharing documents**—from simply displaying them to having several people work on them simultaneously. Collaborators can
display documents online and discuss the contents via email, videoconference or chat. They can use annotation systems to comment on shared documents and editing tools to co-edit documentation online.

- *Synchronous communication* activities such as Internet “chat” and videoconferencing—differ from the other types of activities in that they happen in real time, over a short period. These technologies allow users to discuss ideas, debate problems, and share information electronically when face-to-face interaction is desired but not possible.

- Teachers participate in *online courses or workshops* to learn something new. They are like traditional courses and workshops, but without face to face meetings. The electronic component allows people to participate whenever and from wherever they want. (Koufman-Frederick et al., 1999, pp. 1-2)

Since online collaboration in education is primarily identified with Distance Education or Distance Learning, it is in this context that many relevant studies are found. “Distance education takes place when a teacher and student(s) are separated by physical distance, and technology (i.e., audio, video, data, and print) is used to bridge the instructional gap” (Willis, 1994, p. v). In the mid 1990s, Markwood wrote that “computers are rapidly becoming the preferred long-distance communication tool, and computer networks are evolving as a major resource in distance education” (1994, p. 199). In 1993, the Internet service known as the World Wide Web became available to the public and began rapid expansion with the release that year of Mosaic, a graphically-oriented browser (Feizabadi, 1996). The rapid growth of the Web is demonstrated by the
growth in the number of Web sites. “In June 1993, the Web boasted just 130 sites. By a year later, the number had risen to nearly 3,000. As of April 1998, there were more than 3.3 million sites on the Web” (Narang, 2006, p. 28). As it grew, distance educators increasingly used the World Wide Web to reach and interact with their students.

For their metastudy of research on distance education effectiveness, Zhao, Lei, Lai, and Tan (2005) began with an initial list of 8,840 potentially relevant articles. Through filtering and coding, they narrowed their study to the analysis of 51 articles that contained empirical research comparing face-to-face education with distance education published in journals between 1966 and 2002. Their analysis confirmed that most of the studies reported “no significant difference” in effectiveness between the two types of education. In further analyzing the data reported in the studies, Zhao et al. identified several significant and useful factors affecting differences, including the authorship, the degree of interactivity with the instructor, evaluation methods, students’ academic level, level of the content, type of interaction, and media used. And although the overall results of the studies indicated no significant difference between methods, “studies published in and after 1998 found distance education to be significantly more effective than face-to-face education” (p. 1855). This time-frame coincides with the rapid expansion in popularity and use of the World Wide Web in education and other areas of users’ lives (Gray, 1996).

With the expansion of asynchronous communication and collaboration through computers, research has shown that online communication and collaboration is as effective as face-to-face collaboration in terms of the amount of learning that takes place
and the quality of the end-product produced as a result of the collaborative learning experiences. In their study of 43 graduate students, however, Ocker and Yaverbaum (1999) found that in terms of student satisfaction, face-to-face collaboration appears to be superior to asynchronous collaboration through computer conferencing. Most of the students in the study were part-time students with full-time jobs. Even with nontraditional students, simply making the technology available was not sufficient to ensure their satisfaction with the collaborative learning process. The researchers raised a very important point when they wrote: “Although asynchronous collaboration is increasingly being used in the workplace within ‘networked’ organizations, it remains foreign to the vast majority of students” (pp. 436-437). They observed that most students are very familiar with communicating via email, but that accomplishing complex collaborative work online is very different. They recommended increasing students’ exposure to the use of asynchronous technologies for collaborative tasks, and better educating students regarding the benefits of this form of collaboration.

Wikis: Online Group Collaboration Tools

One of the “new” online software resources that is an effective tool for collaboration, in education as well as other environments, is the “Wiki.” Although the first Wiki was developed in 1995, more educators began looking at Wikis in 2004 and 2005 as experimentation with Web 2.0 services was started by some teachers and educational technologists. Leuf and Cunningham (2001) defined a Wiki as “a freely expandable collection of interlinked Web ‘pages,’ a hypertext system for storing and modifying information—a database, where each page is easily editable by any user with a
forms-capable Web browser client” (p. 14). Ebersbach, Glaser, and Heigl (2006) offered a somewhat less-technical definition:

A Wiki is web-based software that allows all viewers of a page to change the content by editing the page online in a browser. This makes the Wiki a simple and easy-to-use platform for cooperative work on texts and hypertexts. (p. 10)

Skiba (2005) described the defining characteristics of a Wiki as social software that allows the ability to edit and add to a Wiki document with relative ease; a simplified hypertext markup language for creating documents; and an open editing philosophy in which the community can edit and add to the document. (pp. 120-121)

Meatball, a Wiki community, reports there are currently some 200 different types of Wikis (Ebersbach et al., 2006). Lamb (2004) pointed out that “Wikis” are not all the same. “In practice, the term Wiki is applied to a diverse set of systems, approaches, and projects” (p. 38). Even though variations are found among different Wiki programs and applications, Lamb identified several fundamental principles which usually apply to Wikis:

- **Anyone can change anything.** Wikis are quick because the processes of reading and editing are combined. The signature of a Wiki is a link at the bottom of the page reading “Edit text of this page” or something similar.
- **Wikis use simplified hypertext markup.** Wikis have their own markup language that essentially strips HTML [Hypertext Markup Language] down to
its simplest elements. New users need to learn a few formatting tags, but only a few.

- *WikiPageTitlesAreMashedTogether* [sic]. Wiki page titles often eschew spaces to allow for quick page creation and automatic, markup-free links between pages within (and sometimes across) Wiki systems. Linking to related pages is easy, which promotes promiscuous interlinking among Wiki pages.

- *Content is ego-less, time-less, and never finished.* Anonymity is not required but is common. With open editing, a page can have multiple contributors, and notions of page “authorship” and “ownership” can be radically altered...For the most part, Wikis are in a constant state of flux. Entries are often unpolished, and creators may deliberately leave gaps open, hoping that somebody else will come along to fill them in. (Lamb, 2004, p. 38)

Ebersbach et al. (2006) provided a more extensive list, describing common characteristics of Wikis in terms of several technical core functions:

- *Editing.* The “Edit” button is the ultimate typical feature of a Wiki. Only in extreme cases are specific pages excluded from the editing option... Since blocking [the editing function] goes against the grain of the Wiki philosophy, it should be avoided when possible.

- *Links.* Each article can be linked to other articles, and thus form a new network structure... Links can be created in most Wikis using a WikiWord [sic]: Words are capitalized and written together without a space... a link is
thus generated that appears in the normal view. If a respective linked page within a Wiki does not yet exist, it can be created with a simple click of the mouse on that link. In this way, Wikis support associative links between pages in that they design and display links in an almost intuitive manner, whether or not an intended link exists. The new pages are now linked to the existing ones and thus are part of the hypertext structure.

- **History.** This function basically saves all previous versions or modifications of any single page. Here, it is possible to exactly track the editing process of an article, since all changes have been documented. The “History” function allows a previous version to be opened and saved again, in order to restore the original content (roll-back) . . . More complex Wiki clones [programs] offer a so-called “Diff” function, which displays detailed alterations between two versions, such that authors do not need to compare two texts line for line.

- **RecentChanges [sic].** This page either provides a current overview of a certain number of recent changes to Wiki pages or all changes within a predefined time period. It is produced automatically and cannot be changed by users.

- **SandBox [sic].** Wikis usually offer instructions and introductions on their home page, which serve to facilitate working with the system. In addition, new users, as well as experienced ones, can use the so-called SandBox or PlayGround [sic] to learn how to use Wikis and try out various solutions without having to use a regular page.
• Search functions. Most Wikis also offer a classic full-text or title search for the Wiki pages. (pp. 19-20)

Mann (2005) summarized the essential characteristics of Wikis in term of three elements:

1. Group Collaboration: easily and quickly have a group of people add to a central store of information that grows organically over time.
2. User Driven: the community of users around a Wiki are what determines its usage and evolution.
3. Constant Change: since typically anyone can edit anything, you find rapid change and a general trend to more complete/accurate information, with the revision feature allowing for rollbacks in case of accidental, malicious or incorrect edits. (Definition of a Wiki section, ¶ 5)

Publishers, educators, and other professionals point to Wikipedia, a free online encyclopedia, as a primary example of the Wiki approach. For example, Nature magazine pointed out that in spite of the open editing environment in which anyone could edit Wikipedia entries, recent indications were that accuracy was high in areas it studied. They described Wikipedia as a huge reference source approaching a million articles in the English version alone (Wiki’s wild world, 2005). Reports about online education in Medical Teacher included Wikipedia’s ability to let the reader edit and contribute to articles (E-learning and all that jazz, 2006). Krause (2004) explored the concept of an interactive collaborative website using Wikipedia as the example.
Businesses are increasingly using Wikis. In their survey of 168 corporate users of Wikis, Majchrzak, Wagner, and Yates (2006) found that users stated three main types of benefits from corporate Wikis: enhanced reputation, work was made easier, and helping the organization to improve its processes. The researchers asked about the work activities the Wiki was used to support and received a range of responses. The most commonly mentioned were the support of software development, e-learning, project management, posting of general information and knowledge management, communities of practice and user groups, ad-hoc collaboration, tech support, marketing and customer relationship management, resource management, and R&D (research and development). Contrary to their expectations, they found the more additional channels of communication respondents used to collaborate with others, the greater the benefits to their work. Although it is not critical that Wikis be the only communication method for them to be effective, “Wikis may functionally bridge the gap between development of knowledge and discussion of what was developed, which does not occur easily with other communicative media such as email” (p. 102). This study suggests there are different types of Wiki contributors: some who focus primarily on adding new content, whom they call “adders,” and some who focus primarily on synthesizing already existing content, a group they call “synthesizers.” They also identified users who focus on both types and well as users who make minimal contributions of either type.

Majchrzak et al. (2006) concluded their study with several implications for successful use of Wikis in the corporate environment, including clearly identifying benefits to the organization and to collaboration of using the Wiki; seeking out both
impact-oriented individuals and utilitarian-oriented individuals to ensure that each Wiki has both synthesizers and adders; tying the Wiki to more novel rather than routine tasks; and ensuring that Wiki users recognize that knowledge must be credible and that synthesizing is as important as adding, thus increasing the probability that benefits will be achieved.

Wikis in Education

On the “Using Wiki in education” website co-authored by Mader and Rooke, Mader and Rooke (2006) described the Wiki as “an ideal tool for the increasing amount of collaborative work done by both students and teachers,” saying that “students might use a Wiki to collaborate on a group report, compile data or share the results of their research, while faculty might use the wiki to collaboratively author the structure and curriculum of a course” (What is a wiki? Section, ¶ 2). Several ways to use Wiki in education are discussed by Mader and Rooke:

1. Easily create simple websites. The simplicity of wiki syntax, compared to the skills needed to create a typical website, allows students to spend more time developing the content of the web site.

2. Project development with peer review. A wiki makes it easy for students to write, revise and submit an assignment, since all three activities can take place on the wiki. At each stage of the process, the teacher and the student’s peers can comment on the work and offer suggestions.

3. Group authoring. Groups often collaborate on a document by “pushing” it out by email and having each group member edit it on their own computer. Use of
a wiki, however, “pulls” the group members together to build and edit the document on the wiki page. This can strengthen the community, allow group members with overlapping or similar ideas to see and collaboratively build on each others’ work, and allows all the group members to have immediate, equal access to the most recent version of the document.

4. Track a group project. A wiki project can be set up with pages group members can use to track the status of their own work on the project, make research notes, see what sources other group members have already checked, and document other activities that can be useful to the group as they develop and complete the collaborative project.

5. Data Collection. Since it is easy to edit, a wiki can be very useful for collecting data from a group of students. At least one version of wiki software has a data collection tool that can be installed with just a few mouse clicks.

(Mader & Rooke, 2006, Ways to Use Wiki in Education section, ¶¶ 1-5)

In their study of 24 university wikis used in Western universities, Schwartz, Clark, Cossarin, and Rudolph (2004) found that wikis tended to be used by specific departments or for particular topics rather than for campus-wide applications. Project management was a fairly common use for course group projects within some fields, including music and languages.

Barton (2004) identified some of the innovative ways wikis could be used in composition classrooms:
1. Any class project with a reference or encyclopedic format. Instructions, manuals, glossaries, and the like are all excellent wiki applications.

2. A class or group project with a bibliographic format. Students could gather websites related to a topic, then annotate, rank, and organize them.

3. A letter or statement presented on behalf of the class. These documents occur often enough in the business world, where the words “on behalf” basically mean that everyone involved signed off on a draft. On a wiki, such a project would offer everyone a better chance to make a contribution.

4. A handbook or textbook. Students could build a guide to correct punctuation and evaluate it as a class. Thus, every student would have a stake in the project and likely benefit from the instruction it contained. Students are also familiar with “textbook” English and its avoidance of personal-sounding prose.

5. Any other project that does not require specified authorship or protected documents. Wikis are authored by communities, not individuals. (¶¶ 27-31)

Courses from different disciplines are using wikis, including these courses described on the “Using wiki in education” website, a Wiki with main contributions by co-authors Mader and Rooke supplemented by user input:

- BIOL 414/614: Eukaryotic Genetics and Molecular Biology, a Biology course at UMBC, an honors university in Maryland, using a wiki as a course web site. The site includes course and student information, projects and group collaboration resources.
- Blogs and Wikis—a course about blogs and wikis taught in the English Department at Bemidji State University which uses a wiki as a primary element of the class.

- PSY0055, Introduction to Sleep, and PSY111, Personality and Clinical Assessment—two Psychology courses at Brown University which use wikis to collect data from students in the course. In the past, data was submitted by students in print or e-mail form and formal data entry was performed by teaching assistants. Using the wikis, students do the data entry themselves, adding to their skills in working with data.

- English 15: Rhetoric and Composition—one of three required core courses in Rhetoric at Pennsylvania State University. It uses a wiki for students to blog about their experiences during the class, develop ideas for their writing projects, and benefit from community input.

- The Collaborative Writing Project is a wiki created by Paul Schacht, Associate Professor of English at the State University of New York Genesco, to enable students in his classes to do various types of collaborative writing related to the content and level of the specific courses. (Courses Using Wiki section)

In research and education, Wikis are useful tools. Sauer et al. (2005) discussed Wiki’s ability to enable research groups to author documents collectively using a web browser. Team members are able to share knowledge simply and quickly, and the collective knowledge base of the group can be efficiently managed and navigated. Porta
(2006) reported that the International Epidemiological Association and Oxford University Press are calling for submissions to the 5\textsuperscript{th} edition of *A Dictionary of Epidemiology* through an online Wiki.

*Science* (Net Watch, 2006) reported that the website www.fluW wikie.com, or Flu Wiki, a user-written collaboration Wiki, provides solid information about the H5N1 avian influenza virus and its potential to trigger a human pandemic. The Ocean Renewable Energy Coalition has used a Wiki website for collecting its members’ responses to new regulations that will affect them (News briefs *[Environmental Science and Technology]*, 2006). Frumkin (2005) discussed three potential Wiki applications for digital libraries: as a knowledge base tool, as a content management tool, and as a tool to empower interactive finding aids. Chawner and Lewis (2006) also discussed Wikis in library and information management contexts. After discussing Wiki’s ability to provide an environment for Web-based collaboration and Web site content management, they described three different Wiki engines (programs) and seven case studies of real-world library and library-related Wiki applications. In addition to these areas, many other disciplines are using Wikis. Examples include language education (Goodwin-Jones, 2003), medical practice and medical education (Nakata, Suzuki, Fukuda, & Fukuda, 2004), and Journalism (Dorroh, 2005).

**Challenges in Using Wikis in Education**

The use of Wikis in education is a relatively new area of application and study. Although studies of the results are relatively limited so far, useful observations are emerging. Fountain (2005) shared preliminary observations pertaining to Wiki research
work being conducted in her graduate and undergraduate technology courses as well as another research project involving wikis. Preliminary analysis across the research projects includes several points. The exclusive use of Wiki software to conduct research in digitally-based research groups within which participants did not know each other complicated student psychosocial relationships. Frequent misunderstandings occurred because of the absence of visual and verbal cues and projects were cumbersome to organize. In spite of these difficulties, students reported that they liked working with wikis, appreciating the simplicity, autonomy of access, ability to share work with others, and ability to view others’ work.

Although most of these responses could also apply to other methods of asynchronous online collaboration as well, one of the main and relatively unique characteristics of wikis, the ability to easily edit other contributors’ Wiki work, was somewhat problematic. “The task of publicly critiquing others’ work [online] proved to be psychologically difficult (afraid to hurt or be hurt) and frustrating (offering, but not receiving quality critique) for many” (Fountain, 2005, endnote 25).

Blank, Cassidy, Dalke, and Grobstein (2005) conducted a summer workshop for high school teachers that incorporated a Wiki in some of the assignments. They wrote:

One concern which arose over the two-week period [of using the Wiki] was that the teachers were not truly collaborating, not really working together to create new ideas and approaches that resulted from building on one another’s ideas or from the synergistic interaction of different ideas. Their collaborations seemed to some of us largely limited to helping one another master aspects of technology,
dividing up labor (“I’ll look for links about genealogy, while you find a good image”), or editing for spelling and grammar. (p. 23)

Bruns and Humphreys (2005) summarized the main problems reported by Blank et al. (2005) related to the collaborative processes in the Wiki:

First, students in the class were too polite to want to interfere with other students’ work. This meant that at least to begin with, very few edits were made on other people’s work. Secondly, students did not want their own work to be interfered with by others. This conceivably pertains to the design of the exercise in this particular Wiki, where students ‘owned’ particular pages individually. As the entries on the pages were attributable to them and public, they did not want other people to add to or change their work. Third, students were reluctant to release their work into the public domain is a less than perfect state—they did not want their work in progress to be subject to scrutiny and judgment. (p. 5)

Bruns and Humphreys (2005) used these issues to reflect on important aspects of collaboration in a conventional education system:

These are interesting issues in that they represent to some extent the uneasiness with which people encounter collaborative and networked environments and multiple authorship. It is possible that only if we make explicit the differentiation between zones of individual and collaborative activity will students begin to benefit from the different kinds of learning available to them in collaborative environments. The issues raised above also represent issues of a conventional
educational system based on linear production (of delivery, of work, of
authorship) meeting a networked production system. (p. 5)

Finally, based on evaluation of Wiki projects, Fountain (2005) stated that there
are several general points to consider in evaluating Wiki use in higher education:

1. Just bringing in a new tool does not change practice. Co-elaboration and
   cooperation will not simply occur because wikis are introduced to one’s
   practice.

2. Content knowledge can be improved, but this takes time and does not work
   where individuality is upheld.

3. Using new tools in place of other tools works, but is not the best use of wiki
   space and potential (i.e. using wikis as overheads).

4. Quality of language can be maintained—or even improved—if versions ready
   for quality assessment are identified. Students do not want to think about
   language questions until they are ready; they want to exchange freely, then
   present the information well.

5. Open authoring (autonomy and non-authority) does not necessarily lead to the
   destruction, modification or copying of others’ work.

6. Co-authorship is not a problem for the students if the guidelines for evaluation
   are clear. (Fountain, 2005, Wiki project evaluations section, ¶ 4)

Although some of these points can also apply to other online learning methods, they are
important observations and considerations about effective use of wikis in education.
In the conclusion of their study of face-to-face and asynchronous computer-mediated group collaboration described earlier in this chapter, Ocker and Yaverbaum (1999) provided an important and helpful perspective about online collaboration and learning:

The results of this experiment indicate that a technologically-supported collaborative environment is an effective means of learning and conducting complex group work. However, it also shows us that people prefer to interact in a FtF [face-to-face] manner. Social change is a slow process. Whether we can change students’ perceptions over the long run remains to be seen. (p. 438)

Summary and Conclusion

In this chapter we have highlighted characteristics of the new learners—the Net Generation—persons who have experienced computers and electronic entertainment and communication their entire lives. In previous cultures, educators have used their society’s dominant communication methods for instruction. To meet the needs of the Net Generation learners of the Information Age, educators, and educational leaders need to extensively utilize computer and networked communication technologies in learning. We have looked at the Internet and World Wide Web and their use in education during the past two decades. Collaborative and cooperative learning are powerful strategies in learning today, helping to facilitate the construction of meaningful knowledge and development of learning communities. We have seen the need for new and effective methods of assessment in collaborative group learning. Numerous studies conducted over the past 25 years have shown there is no significant difference in learning effectiveness
with electronically-mediated instruction compared to conventional classroom education, and often that electronically-mediated programs result in higher levels of learning than in conventional classroom education. With the availability of new interactive applications and services through the Read/Write Web, or Web 2.0, online group collaboration tools are easily accessible to educators and learners. Wikis are online collaboration programs which allow open reading, posting, editing, and deleting of material in a common document, and so forth, by anyone in a group at any time, and in real time. We have highlighted several early uses of Wikis in education and the main challenges of this method of open collaboration.

In this study we examine the application of Wikis for project development through group collaboration in the college classroom. We compare the effectiveness of Wiki collaboration with the traditional face-to-face group collaboration method, and identify issues involved in the utilization of this new technology. By examining the experiences of upper level undergraduate students in their use of the Wiki for group collaboration, we identify and better understand both the strengths and weaknesses of using Wikis for academic group collaboration in higher education.
CHAPTER III
RESEARCH METHODOLOGY

Introduction

Through this comparative research study we seek to better understand how students in higher education experience the use of online collaborative Wiki software for group projects and how the quality of Wiki-based online collaborative projects compares with traditional face-to-face collaborative group projects.

Population

The study took place during the Spring 2006 semester at a Carnegie Foundation Classification MA1 private liberal arts university in a Midwestern state. Participants in the study were Juniors and Seniors taking a required capstone course in the university’s undergraduate Communication Arts (Radio/TV and Journalism) major. The mass communications field is experiencing major changes because of the application of new technologies and many textbooks have not been able to reflect many of the rapid changes. Student-based research and reports about current trends and technologies were well-suited to this class. Collaborative activities should result in sharing of information among peers.

All 15 students enrolled in the course agreed to participate in the study. All of the study participants were Communication Arts majors, with two participants double-
majoring; in addition to Communication Arts, one was a Philosophy major and one was a Theology major. Eight of the participants were female and seven were male.

Participants were assigned randomly to one of two groups for the study. Because the total number of participants was not even, one group had eight members and the other had seven.

**Wiki Software Used in the Study**

The initial Wiki software used in the study was TikiWiki, a free Wiki program supported by a community of developers and users. The software was installed and hosted by Siteground.com, an independent commercial Web hosting service, and used for the warm-up activity.

Several days after the warm-up activity, but before starting the major assignments for the study, an unexpected problem occurred with the Internet server and/or the TikiWiki software, requiring the use of a different Wiki program for the remainder of the study. At the time, the researcher was evaluating Moodle, open-source Learning Management software which had added a Wiki module to its components. Since Moodle had been stable on the Siteground.com server the researcher was using, the Moodle Wiki was used for the remainder of the study. Although the interface was different, the Moodle’s Wiki functionality was similar to TikiWiki. Participants were informed of the need to use a different Wiki and were given a demonstration of the new Wiki program that would be used for the remainder of the study. The same usernames and passwords were assigned to participants to use with the new Wiki. Through personal and e-mail communication, the researcher encouraged participants to report any difficulties and ask
any questions they had about the change. No difficulties were reported by the participants.

Study Procedure

During the last seven weeks of this semester-long course, student data was collected through a series of three surveys taken by all of the study’s participants after they completed each of three activities. All of the study’s online surveys were uploaded by the researcher and administered through SurveyConsole.com, a commercial online survey service provider. Each online survey was taken individually by participants at a location of their choosing, with a deadline to complete each survey within 72 hours of the end of each study task. The last phase of the study was to conduct interviews with participants.

The study began with a warm-up activity to familiarize participants with the Wiki software; to help identify technical or user problems with login procedures, and so forth; and to give participants the opportunity to ask questions about using the program. The warm-up activity began in a university computer lab with all participants accessing and using the Wiki software simultaneously. This setting was used to enable the researcher to observe participants’ initial use of the Wiki software, troubleshoot any problems that arose, and respond to questions participants may have. The specific tasks of the assignment were to (a) Log on to the Wiki software using the Username and Password assigned to each participant by the researcher; (b) Navigate to the study’s Main Wiki page; (c) Select the Wiki’s “Edit” function; (d) Add their name, home town, and an interesting fact or story about themselves or their hometown; and (e) Post their
information on the Wiki using the appropriate “Save” function. Participants were instructed and encouraged throughout the activity to inform the researcher about any difficulties they were having and ask any questions they had about the Wiki or the activity. After the group session in the computer lab, some of the participants continued work on this Wiki activity from other locations.

After finishing the warm-up activity, participants completed the first of three online surveys taken during the course of the study. As part of this survey, participants were asked to identify the type of location they used to access the Wiki program during the warm-up assignment and where they planned to access the Wiki for future projects in the study. Since the Wiki is an online program accessible 24 hours a day, 7 days a week, access location could help or hinder participation. The first section of the survey, items 1-4, is designed to collect basic demographic information about the participants and their academic class level. Section 2, items 5-8, gathers data to provide a sense of computer and new technology use by participants. The items and response choices are modeled on the national survey of student engagement. Sections 3 through 5, items 9-12, ask the students to indicate the location or locations where they accessed the online Wiki software for the icebreaker assignment, what problems they encountered accessing and using the Wiki software, where they planned to access the Wiki site for future assignments, and indicate any questions they had about accessing or using the Wiki software. Participants were asked to also report any questions or technical problems they had to the researcher so that questions could be answered and problems solved prior to the next phase of the study. Data was also collected to provide information about
participants’ use of computers and other electronic communications resources. It was expected that moderate and heavy computer users would have less difficulty learning and using the Wiki software than persons who used computers only occasionally. Participants were asked to indicate their use of computers and other electronic communications resources during a typical week, selecting a range of hours of usage for different categories indicated in Survey 1. Ranges included 0 hours, 1-5 hours, 6-10 hours, 11-15 hours, 16-20 hours, 21-25 hours, 26-30 hours, or more than 30 hours. Section 6 of Survey 1 consists of the 20-item Classroom Community Scale (CCS) developed by Rovai (2002a) to assess the learning and community aspects of the class and provides baseline data for comparison with later administrations of these items. The CCS has been refined to a 20-item list of statements to which students respond using a 5-point Likert-like scale ranging from “Strongly Agree” to “Strongly Disagree.” The CCS measures both Connectedness (sense of community) and Learning.

- **Connectedness** represents the feeling of the community of students regarding their connectedness, cohesion, spirit, trust, and interdependence”—factors identified in the literature as important elements of community

- **Learning** represents the feelings of community members regarding interaction with each other as they pursue the construction of understanding and the degree to which members share values and beliefs concerning the extent to which their educational goals and expectations are being satisfied. (Rovai, 2002a, pp. 206-207)
The final section of the survey was optional and provided an opportunity for the respondent to add any comments to explain their responses. Copies of the survey instruments are included in Appendix B.

For the remainder of the study, each of the participants was randomly assigned to one of two small groups. During the study, each group received two identical assignments. During the first assignment, Group 1 collaborated on the assignment face-to-face and Group 2 collaborated only on the Wiki, with additional communication about the assignment limited to electronic means such as e-mail and Instant Messaging. For the second assignment, the collaboration methods were reversed; Group 1 used the Wiki and Group 2 worked face-to-face. Each assignment had a duration of three weeks.

At the end of each assignment, all the members of both groups took online surveys about the group assignment. All surveys included items about their Group Collaboration and the 20-item Classroom Community Scale instrument. The Group Collaboration section, containing 15 items, asks respondents for a self-evaluation and a group evaluation for this assignment. These items were developed by Azwell (1995) and have been used to assess performance in collaborative learning projects in higher education. In addition, items concerning Wiki collaboration and participants’ use of common elements of the Wiki software were included in the survey taken by the group which had just completed the Wiki assignment. The final survey also contained open-ended items asking participants to reflect on their experiences of group collaboration and the Wiki. The study concluded with personal interviews with study participants. Copies
of the survey instruments and the interview questions are included in Appendices B and C.

For Project 1, each of the two groups was assigned to create a comprehensive document that provided a review of the present state of Radio Broadcasting and projected the effects of new technologies and audience behavior on the radio industry. Participants were given a handout describing the Assignment, Objective, Criteria, and Evaluation, and specific instructions about the method of Group Interaction to be used by each group. The handouts were distributed to the participants in person and described orally, with time allowed for the participants to ask any questions they had about the assignment, especially the collaboration criteria for each group. Figure 4 shows the assignment sheet given to the participants.

The 10 Evaluation criteria that are described on the assignment handout are the 10 criteria specified on the Evaluation Form that was sent to industry professionals at the end of each group project. Criterion number 8 evaluates how effectively the document reflects a “neutral point of view” in its tone. Having a neutral point of view is a requirement for documents posted on Wikipedia, the best-known and arguably the largest Wiki on the World Wide Web. To help the study participants understand the neutral point of view concept, a second page describing this area was distributed to participants when they received Assignment 1. This handout includes a brief discussion of the Formulation of the Neutral Point of View by Jimmy Wales, founder of Wikipedia. Figure 5 is the handout.
Telecommunications Management
Group Assignment 1
Radio in the New Millennium

Assignment: Each group is to create a comprehensive document that provides a review of the present state of Radio Broadcasting and projects the effects of new technologies and audience behavior on the radio industry. The document should be a thorough report providing practical professional information. This is an opportunity for you to make a valuable contribution to the field. After a period of evaluation by radio professionals and possible final editing, the documents will be posted on a website freely available to the public.

Objective: The objective of this assignment is to provide important information about the radio industry that will be relevant to several audiences, including: students considering careers in the radio industry; people working in radio broadcasting; present and potential investors/financial supporters of radio.

Criteria and Evaluation: After the due date, copies of the documents will be sent to several radio professionals for their evaluation and feedback. The evaluators will be asked to specifically address:

1. Is the report comprehensive?
2. Is the information accurate?
3. Is the report organized in a logical manner?
4. Is the report coherent as a whole?
5. Is the style consistent?
6. Does the report include relevant references?
7. Are spelling, punctuation, capitalization and grammar correct?
8. Does the report’s language reflect a “neutral” point of view (factual tone, not opinionated)?
9. Does the report demonstrate a thorough understanding of important concepts and provide new insight?
10. Is the report useful?

The evaluators will also be invited to add other comments if they wish.

Group Interaction: A very important part of these projects is to give you additional experience in professional collaborative work through both face-to-face and computer-based interaction, something many of you will be doing in the future. Therefore, please follow these guidelines:

- **Group 1** is to work in face-to-face group settings, although individual online research in advance of the group settings will be necessary. The group work is to be done in person. Group 1 will meet together during the scheduled class times.
- **Group 2** is to do all group work exclusively online, using their course wiki at www.fusionline.org/commarts. Online discussions and e-mail may also be used. **But the members of this group should not work on the project in person.** Group 2 will not meet during the class period for the duration of this project.

*Figure 4. Assignment instruction handout for Group Project 1*
Neutral Point of View: As noted above, the final documents will be posted on a public website for access by students, professionals and the public at large. The documents are to meet the criteria of Wikipedia’s Neutral Point of View (NPOV) policy. The policy as originally stated by the founder of Wikipedia appears below. More extensive information is available online at: http://en.wikipedia.org/wiki/WP:NPOV

The original formulation of NPOV

A general purpose encyclopedia is a collection of synthesized knowledge presented from a neutral point of view. To whatever extent possible, encyclopedic writing should steer clear of taking any particular stance other than the stance of the neutral point of view.

The neutral point of view attempts to present ideas and facts in such a fashion that both supporters and opponents can agree. Of course, 100% agreement is not possible; there are ideologues in the world who will not concede to any presentation other than a forceful statement of their own point of view. We can only seek a type of writing that is agreeable to essentially rational people who may differ on particular points.

Some examples may help to drive home the point I am trying to make:

1. An encyclopedic article should not argue that corporations are criminals, even if the author believes it to be so. It should instead present the fact that some people believe it, and what their reasons are, and then as well it should present what the other side says.

2. An encyclopedic article should not argue that laissez-faire capitalism is the best social system. [...] It should instead present the arguments of the advocates of that point of view, and the arguments of the people who disagree with that point of view.

Perhaps the easiest way to make your writing more encyclopedic is to write about what people believe, rather than what is so. If this strikes you as somehow subjectivist or collectivist or imperialist, then ask me about it, because I think that you are just mistaken. What people believe is a matter of objective fact, and we can present that quite easily from the neutral point of view.

--Jimbo Wales, Wikipedia founder

Figure 5. Neutral point of view handout
After the groups completed the first assignment, the participants took the second of three online surveys administered during the study. The surveys were partially different for each group in that surveys for the group which had worked on the Wiki for Assignment 1 also included items specifically addressing their experience with the Wiki and Wiki collaboration.

When the surveys were completed, Assignment 2 was distributed to participants. Assignment 1 addressed Radio and the subject matter for Assignment 2 was Television and the Television industry. In addition to this content change, the collaboration methods for the groups were reversed: Group 1 was required to work on the Wiki and Group 2 worked face-to-face. As shown in Figure 6, the other elements of Assignment 2 were identical to Assignment 1.

After the completion of Project 2, participants took the last of the three online surveys for the study. The surveys for both groups again included items about group collaboration in general and the Classroom Community Scale items. In addition, items related to the Wiki collaboration were part of Group 1’s surveys, and all of these final surveys included five open-ended questions asking the participants to reflect on the advantages and disadvantages they experienced in collaborating face-to-face and collaborating through Wiki software, sharing what they thought were the principle advantages and the principle disadvantages of each type of collaboration and indicating which method of collaboration they preferred.
Telecommunications Management
Group Assignment 2
Television and Video in the New Millennium

Assignment: Each group is to create a comprehensive document that provides a review of the present state of Television Broadcasting and projects the effects of new technologies and audience behavior on the television industry. The document should be a thorough report providing practical professional information. This is an opportunity for you to make a valuable contribution to the field. After a period of evaluation by television professionals and possible final editing, the documents will be posted on a website freely available to the public.

Objective: The objective of this assignment is to provide important information about the television industry that will be relevant to several audiences, including: students considering careers in the television industry; people working in television broadcasting; present and potential investors/financial supporters of television.

Criteria and Evaluation: After the due date, copies of the documents will be sent to several television professionals for their evaluation and feedback. The evaluators will be asked to specifically address:
1. Is the report comprehensive?
2. Is the report accurate?
3. Is the report organized in a logical manner?
4. Is the report coherent as a whole?
5. Is the style consistent?
6. Does the report include relevant references?
7. Are spelling, punctuation, capitalization and grammar correct?
8. Does the report’s language reflect a “neutral” point of view (factual tone, not opinionated)?
9. Does the report demonstrate a thorough understanding of important concepts and provide new insight?
10. Is the report useful?
The evaluators will be invited to add other comments if they wish.

Group Interaction: A very important part of these projects is to give you additional experience in professional collaborative work through both face-to-face and computer-based interaction, something many of you will be doing in the future. Therefore, please follow these guidelines:
- Group 1 is to do all group work exclusively online, using their course wiki at www.fusonline.org/commarts. Online discussions and e-mail may also be used. But the members of the group should not work on the project in person.
  Group 1 will not meet during the class period for the duration of this project.
- Group 2 is to work in face-to-face group settings, although individual online research in advance of the group settings will be necessary. The group work is to be done in person. Group 2 will meet together during the scheduled class times.

Figure 6. Assignment instruction handout for Group Project 2
The final stage of participant involvement in the study consisted of personal interviews with the participants which were conducted during the week after the online surveys had been completed.

At the end of the study, 11 of the 15 participants (73%) responded to the Interview Questions either in writing (7) or orally (4). The questions first asked the participant’s overall opinion about the group projects in the course, and then specifically invited responses about the effectiveness of collaboration in the group projects, both by members of the group and by the individual participant. The participant was asked their opinion of the use of the course Wiki as a collaborative resource. The next questions asked whether the respondent encountered any obstacles to using the course Wiki and, if so, to identify them and how they dealt with the obstacles. The participant was asked for their opinion about the group projects and how they could be improved. Finally, the participant was asked if they would like to add any further comments.

Quality of Assignments

One of the areas of interest in this study was the quality of work produced by collaborating online through Wiki software versus collaborating in conventional face-to-face groups. The first assignment in the study required that the members of each group collaborate on writing a comprehensive report about the Radio industry and the second assignment was to write collaborative reports about the Television industry. The completed reports were sent to professionals who had experience in and knowledge of each industry for their evaluation using a 10-item rating sheet which was also included with the reports, selecting a score from 1 through 4 (1 = Needs Substantial Revision; 4 =
Excellent) for each item. The reports were sent to different professionals with knowledge about Radio or Television as appropriate. Figure 7 is the evaluation form sent to the subject matter experts who evaluated the participants’ reports.

Learning and Community

The Classroom Community Scale (CCS) developed and validated by Rovai (2002a) was used to investigate whether Wiki-based collaboration affected participants’ experiences of learning and sense of community during the study. The CCS instrument asked participants to respond to each of 20 statements using a 5-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree.” Responses were scored and the results reported as two subscales—“Connectedness” and “Learning”—which are then totaled into the Classroom Community Scale raw score. Higher CCS scores are interpreted as a stronger sense of classroom community (Rovai, 2002b). The Classroom Community Scale was administered to all participants three times during the study: after the warm-up assignment, following group project 1, and after group project 2.

Data Analysis

Following completion of the course and submission of course grades, the raw survey data was downloaded from the SurveyConsole.com website and entered into SPSS 12.0 for analysis. The surveys included items scored on 5-point Likert scales ranging from 1 to 5; open-ended response items; and Rovai’s Classroom Community Scale, a survey instrument which scores items on a 5-point Likert scale ranging from 0 to 4. For the Likert-scale items, t-tests were performed to analyze the mean scores of the
Figure 7. Report evaluation form sent to communications industry professionals
participants’ survey responses regarding their experiences of group collaboration between the study’s two different methods of collaboration, face-to-face and Wiki-based. Participants’ use of Wiki tools, key collaborative capabilities of the Wiki system, was also analyzed using $t$-tests. The Quality scores of the assignments were compared between treatments for each of the two projects and the differences in scores between treatments within each project were examined. Analysis of the means of the individual Classroom Community Scale items, the subscales and the overall Classroom Community Scale was performed through $t$-tests between each of the two collaboration methods and baseline scores taken before the study projects began and between the two collaboration methods.

Responses from the personal interviews were transcribed, studied, and coded for common themes.

As indicated, Survey 1 provided basic demographic data about the participants, their use of computers and communication technologies, and the locations from which they accessed the course Wiki software. The Classroom Community Scale items in this survey also provided a baseline for later evaluation of changes in participants’ feelings about the learning environment and sense of community in the course after face-to-face and online Wiki-based group projects.

Surveys 2 and 3 asked the participants to evaluate both their individual utilization of group collaboration skills and their group’s skill utilization. Using two-tailed T Tests, responses were analyzed to determine whether there were significant differences within groups and between groups during the study.
Responses to the 20-item Classroom Community Scale were analyzed using $t$-tests to determine whether there were significant differences in participants’ sense of connectedness and learning before the study and after each treatment, face-to-face and Wiki collaboration. $T$-tests were run between the baseline scores obtained at the beginning of the study and each of the two methods, and between the two methods themselves.

Immediately following their group’s Wiki collaboration project, Survey 2 or 3, as appropriate, also asked participants to evaluate their application of typical Wiki characteristics, techniques and tools. This data indicates how extensively participants utilized the Wiki’s common tools and capabilities for their projects. Participants’ experiences using the Wiki software were further investigated during the interviews and written submissions conducted at the end of the study. The interviews also provided participant feedback about collaboration in both the face-to-face small groups and online Wiki-based collaboration.

**Analysis of Group Report Quality**

In order to determine the quality of the final reports created by each small group, each report was evaluated by professionals in the relevant fields who are knowledgeable about the topics of the reports. They evaluated each report using a rubric which asked them to rate 10 characteristics on a 4 point scale ranging from “1 = Needs Substantial Revision” to “4 = Excellent.” Eight of the 10 characteristics are frequently used to evaluate written compositions and reports, while two items, numbers 5 and 8, reflect the
group nature of the project and the public Wiki’s requirement that entries use a language and writing style that reflects a “neutral point of view.”

The reports were read and scored by subject matter experts, professionals in the appropriate communications industry—radio or television—for each report. The professional evaluators were not told that the reports they evaluated were developed using different methods (interpersonal small group vs. online Wiki-based collaboration). The scores of the rubric-based evaluations were compared across treatments. The items relating to consistency of style and neutral point of view help provide additional information about the participants’ implementation of Wiki characteristics.
CHAPTER IV
RESULTS AND ANALYSIS OF DATA

Introduction

As stated in Chapter 1, this study examined the use of online collaborative Wiki software by higher education students. This chapter first reports information about the participants in the study and their computer use. Next are reports of the benefits and obstacles students experienced in face-to-face collaborative group projects and the benefits and obstacles students experienced in online Wiki-based collaboration. Participants’ experience of group collaboration characteristics are reported as well as their preferred method of collaboration. The participants’ use of Wiki capabilities and resources are reported, followed by their responses regarding characteristics of their group report projects. The quality of the collaborative reports as evaluated by subject matter experts is presented. The chapter concludes with reports on the participants’ experiences of learning and sense of community after each method of collaboration as indicated by the Classroom Community Scale.

Study Participants

As indicated in Chapter 3, participants in the study were assigned randomly to one of two groups. Because the total number of participants (15) was not even, one group had eight members and the other had seven. Figure 8 summarizes basic demographic
information about the groups’ members and Tables 1 and 2 report these and additional demographic characteristics for each group’s participants.

All of the participants in the study were White, non-Hispanic undergraduate students, reflective of the institution’s undergraduate enrollment of 85.2% White, non-Hispanic students. In terms of gender, 1/3 of the study’s 15 participants were female and 2/3 were male, unlike the institution’s total undergraduate enrollment of 60.9% female and 39.1% male (NCES, 2006). All of the participants were Communication Arts-Radio/Television majors and were students in a senior-level course required by the major.
Table 1

*Study Participants: Selected Demographic Information*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Race and Ethnicity</th>
<th>Class Level</th>
<th>Enrollment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>P 1</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 2</td>
<td>Female</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 3</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 8</td>
<td>Female</td>
<td>White, non-Hispanic</td>
<td>Junior</td>
<td>Part Time</td>
</tr>
<tr>
<td>P 10</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Junior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 11</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Junior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 12</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Junior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 13</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Junior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 4</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 5</td>
<td>Female</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 6</td>
<td>Female</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 7</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 9</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 14</td>
<td>Male</td>
<td>White, non-Hispanic</td>
<td>Junior</td>
<td>Full Time</td>
</tr>
<tr>
<td>P 15</td>
<td>Female</td>
<td>White, non-Hispanic</td>
<td>Senior</td>
<td>Full Time</td>
</tr>
</tbody>
</table>
Table 2

*Survey Responses: Participants’ Technology Use*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Weekly Computer Use*</th>
<th>Mobile Device*</th>
<th>Where Plan to Access Online Wiki During Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Group 1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P 1</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>P 2</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>P 3</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>P 8</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>P 10</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>P 11</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>P 12</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>P 13</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Study Group 2:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P 4</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>P 5</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>P 6</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>P 7</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>P 9</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>P 14</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>P 15</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

* 0 = None; 1 = 1-5 hrs.; 2 = 6-10 hrs.; 3 = 11-15 hrs.; 4 = 16-20 hrs.; 5 = 21-25 hrs.; 6 = 26-30 hrs.; 7 = 1+ hrs.
As noted above, study participants were assigned randomly to one of two groups. Group 1’s eight members included two females and six males. Five of the participants in this group were juniors and three were seniors. All three of the seniors were in their final semester of study and would be graduating at the end of the term. One of the juniors was the only part-time student in the study. The Communication Arts-Radio/Television major involves several courses requiring the use of computers and editing software, especially at the upper levels. As expected, all of the participants reported using computers for academic purposes as well as for social communication. The two females in Group 1 did not use computers in class and the six males each used computers in class an average of 1-5 hours per week. Outside of class, all the members of this group use computers for academic work. Four of the eight were relatively light computer users (1-10 hours per week), three were moderate users (11-20 hours) and one was a heavy computer user, reporting 26-30 hours for academic work outside of class. Participants were also asked about their use of technology for non-academic social communication. All of the participants in Group 1 use computers for social communication to some extent. Six of the eight were light users, five of these reporting 1-5 hours per week of social communication through computers and the other 6-10 hours. The other two members of Group 1 reported moderate computer use of 11-15 hours per week for social communication. When asked about their use of mobile devices such as cell phones for social communication, three members of Group 1 indicated no use, three were light users (1-10 hours per week), one a moderate user (16-20 hours) and one a heavy user reporting 21-25 hours per week. A final technology-related question asked where each participant
planned to access a computer for the online Wiki assignment. Six of Group 1’s members planned to use computers in campus locations such as computer labs (5) or a campus computer not in a computer lab (1). The other two members of Group 1 planned to use computers at their residences. In terms of overall computer use, there was equity between the females and males. The amount of the two females’ computer use was in the middle of the group and the lightest and heaviest computer users were males. And although the two females were relatively light users of mobile devices for social communication, they used mobile devices more extensively than four of the six males.

Group 2 had seven members and was more even in gender, with three females and four males. All were full-time students. There was one junior in the group and six were seniors. Two of the six seniors were in their final semester of undergraduate study and the other four planned to graduate at the end of the following semester. Individually and as a group, the members of Group 2 used computers and mobile technology more than Group 1. All of Group 2’s members used computers for in-class academic work, four of them for 1-5 hours per week and three for 6-10 hours per week. In terms of their academic computer use outside of class, three were light users (1-10 hours per week), three were moderate (11-20 hours), and one was heavy, reporting 31+ hours of use per week. As with Group 1, all Group 2 participants used computers for social communication, although to a greater extent. Four were light users (1-10 hours per week), two were medium (11-20 hours), and one was a heavy user (21-25 hours). Six of the seven members of Group 2 used mobile devices for social communication. One of these was a relatively light user (6-10 hours per week), four were moderate users (11-20 hours), and
one was a heavy user (21-25 hours). Whereas six of the eight members of Group 1 had planned to use on-campus lab or office computers to access the online Wiki rather than computers at their residences, all seven members of Group 2 planned to access the Wiki at their residences. Group 2’s more extensive use of computers and mobile technology and computer access at their residences may lead to differences in the Wiki projects between the two groups. The female members of Group 2 were in the middle of the group in terms of overall computer use and tended to use mobile devices for social communication somewhat more extensively than the males in their group. All in all, although both groups in the study used computers and mobile communication devices, the participants in Group 2 were heavier users than Group 1 in all categories.

Twice as many seniors in the study were in Group 2 than in Group 1, with seniors making up the majority of Group 2, 6 out of 7. As seniors, they would likely be slightly older than the juniors and would have up to an additional year of higher education than the juniors in the study. The differences in age and academic experience could affect the planning and execution of the group collaboration projects, both face-to-face and Wiki-based.

Figures 9 and 10 provide overview illustrations of the participants’ technology use and the locations used to access the online Wiki programs, information that was listed by participant in Tables 1 and 2.
Figure 9. Participants’ weekly use of computers, the Internet and mobile devices for academic work and for social communication

As reported in Figure 10, following the warm-up Wiki activity most of Group 1’s members planned to use an on-campus computer lab to complete Wiki assignments whereas all of Group 2’s members planned to access the Wiki from their residence. The only problem reported in this survey by participants was an individual login problem during the warm-up activity that had been solved prior to taking the survey.
Advantages of Face-to-Face Group Collaboration

As part of the final online survey, through open-ended questions participants were asked to reflect on their experiences with collaboration in both the face-to-face and Wiki group assignments, sharing what they thought were the principle advantages and the principle disadvantages of each type of collaboration. Tables 3-10 contain all of the survey responses by study participants to the questions asking them to express the

Figure 10. Access location to Wiki program for study activities. (Note: Multiple locations were used to complete the warm-up activity, resulting in totals greater than the number of Group members.)
principle advantages and disadvantages of each of the two methods of collaboration.

Tables 3 and 4 report the responses about advantages to face-to-face group collaboration.

Table 3

*Group 1 Survey Responses: Advantages in Face-to-Face Collaboration*

<table>
<thead>
<tr>
<th>Reflecting on your experience, what were the principle advantages of doing collaborative work in a face-to-face group?</th>
</tr>
</thead>
<tbody>
<tr>
<td>being able to communicate better and organize easier. Structure the paper better.</td>
</tr>
<tr>
<td>We communicated more often.</td>
</tr>
<tr>
<td>it was more personal</td>
</tr>
<tr>
<td>More immediate feedback. You know exactly what it is you need to do or to be doing.</td>
</tr>
<tr>
<td>it was easier to collaborate all of the information together.</td>
</tr>
<tr>
<td>You could say what you wanted at any moment with everyone listening.</td>
</tr>
<tr>
<td>We were able to share our opinions better, and talk about what we needed to add to the report.</td>
</tr>
<tr>
<td>Having set times that people could not put off. Also having the ability to give input live.</td>
</tr>
</tbody>
</table>

There were several common themes about the benefits of face-to-face collaboration in the participants’ responses, including:

- Communication was easier, more effective.
- There was better understanding about what was needed.
- Feedback was more immediate.
- Ideas were more easily discussed and clarified.
In their responses to interview questions asked at the end of the study, participants confirmed the survey responses about their experiences of collaboration in the two different group collaboration settings (face-to-face and Wiki-based). Several respondents described the relative ease of collaborating face-to-face. This description by one of the participants includes and summarizes points also made by others in the study:

When we did the group project person to person, there was one person who stood up and took charge and it went really well because, I think, we were all really accountable to each other. When we were in a group, we were with each other in the classroom, we all could be there. We could all look each other, we could all see each other and we could all just give input. But we all had to be there to listen to the input. And then also we had to set times when we were going to meet,
whether we going to meet the next class period, or were we going to meet half an hour before, or whatever we did. But we had to get together and we had to meet, and so things really got done. (Participant 1)

Another participant stated:

The process of working face-to-face went much better than the online group. Seeing each group member on a bi-weekly basis helped us keep each other accountable for our work and help each other out if someone came across a snag better than the online group. (Participant 2)

Disadvantages of Face-to-Face Group Collaboration

Tables 5 and 6 show each group’s responses about disadvantages of face-to-face collaboration. There were several common themes in the participants’ responses, including:

• Having to meet at a specific time and place was restrictive.
• Not everyone in the group showed up for sessions.
• There were limited opportunities to see other group members’ contributions.

Responses to interview questions included these disadvantages to group collaboration:

Some members of the group did not participate as much as they should have and missed meetings that were crucial to our project being completed. It would have been ok if they let us know through email or a phone, but they never did that. We were just waiting for them to show up; then we were left hanging. (Participant 6)
Table 5

*Group 1 Survey Responses: Disadvantages in Face-to-Face Collaboration*

**Reflecting on your experience, what were the principle disadvantages of doing collaborative work in a face-to-face group?**

- having to meet at a specific time not being able to see the paper as it comes together and easy access to edit it.

- None.

- making sure everyone could show up

- If you needed more research, you couldn’t just search online right away

- So[me] people did alot more work then others

- You had to meet at a particular time.

- People could not explain the information in detail.

- One person had to put everything together so it was hard to get the information and put it together as a group

One setback was that there was no organized guarantee that all students would put forth an equal amount of work. (Participant 4)

I would rather have had at least a few more assignments, preferably separate from the group, in which to balance out my grade, so to speak. It is difficult to judge accuracy when other people have such an influence on your grade no matter how good the rest of the team was. I could have worked the hardest or not done any work at all and I could still get a passing grade, which to me seems unfair, especially if I got a good grade for not working at all. (Participant 2)
Table 6

*Group 2 Survey Responses: Disadvantages in Face-to-Face Collaboration*

Reflecting on your experience, what were the principle disadvantages of doing collaborative work in a face-to-face group?

<table>
<thead>
<tr>
<th>NONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>attendance.</td>
</tr>
<tr>
<td>not every person showed up to class time or turned in there work on time</td>
</tr>
<tr>
<td>People would just not come to class and it made it more difficult for those of us there to get things accomplished.</td>
</tr>
<tr>
<td>not everyone showing up</td>
</tr>
<tr>
<td>just that some members of the group did not have outlines done and didn’t show up.</td>
</tr>
<tr>
<td>I never saw what other people did to contribute.</td>
</tr>
</tbody>
</table>

Advantages of Wiki-Based Group Collaboration

Tables 7 and 8 report the participants’ responses about advantages in Wiki-based group collaboration. As with the responses about face-to-face collaboration, there were several common themes in participants’ responses about Wiki collaboration. In some cases, what were strengths in face-to-face collaboration were disadvantages with Wiki work, and vice versa. Common themes in the participants’ responses about advantages in Wiki collaboration included:

- Didn’t have to arrange meeting times.
- It was easier to work on your own time.
- Everyone could post their own material anytime.
### Table 7

**Group 1 Survey Responses: Advantages in Wiki-Based Collaboration**

<table>
<thead>
<tr>
<th>Reflecting on your experience, what were the principle advantages of doing collaborative work with a Wiki?</th>
</tr>
</thead>
<tbody>
<tr>
<td>everyone having ability to open the paper and edit it, being able to work on it in your own time</td>
</tr>
<tr>
<td>It helped me work with others without talking to them face to face.</td>
</tr>
<tr>
<td>didn’t have to arrange a meeting time</td>
</tr>
<tr>
<td>You could see everyone’s work and didn’t have to ask certain individuals to see what had been done</td>
</tr>
<tr>
<td>it helped us to know each others strengths on more of an individual level</td>
</tr>
<tr>
<td>you don’t have to meet</td>
</tr>
<tr>
<td>It was easy to find and post the needed information.</td>
</tr>
<tr>
<td>The ability for everyone to put their information up</td>
</tr>
</tbody>
</table>

- All group members were easily able to see each others’ work on the project.
- Work was available for editing.
- Easier to get the work updated and spread among members.
- Participants learned a new way of learning and communicating.

One participant discussed the advantage in Wiki collaboration experienced by the group that had first worked face-to-face:

I think that one thing is we had the advantage of first working without the Wiki, and the reason it’s kind of an advantage is that when you’re working together, it’s easier to form a game plan when you’re just right in front of each other. It’s easier to just say, OK, what do we have to do to form a game plan? And the advantage
### Table 8

**Group 2 Survey Responses: Advantages in Wiki-Based Collaboration**

<table>
<thead>
<tr>
<th><strong>Reflecting on your experience, what were the principle advantages of doing collaborative work with a Wiki?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ease of communication</td>
</tr>
<tr>
<td>I learned a new technology and was able to practice communicating with various mediums.</td>
</tr>
<tr>
<td>easier to work at your own time and not class time</td>
</tr>
<tr>
<td>Everyone could contribute in their free time leading to no excuse for people not participating. Also it was nice to see the documents on Wiki.</td>
</tr>
<tr>
<td>easy to get the work updated and spread among group members</td>
</tr>
<tr>
<td>That we could learn a new way of learning and how communicate in a different way other than face to face.</td>
</tr>
<tr>
<td>Everyone could easily see what work had already been done. It was also available for editing even if no one edited it.</td>
</tr>
</tbody>
</table>

that we had is that we just used that same game plan, and once we went electronically, said let’s just do the same thing as last time. Whereas I can see if we had to do the Wiki first, the other way around, I think we would have eventually come to the same logical conclusion of just dividing up the work electronically. But because we had done that beforehand, everybody was just I’ll take this, I’ll take this, I’ll take this, I’ll take this, done. And you just made sure that yours wasn’t taken. It was very easy. (Participant 3)
Disadvantages of Wiki-Based Group Collaboration

Tables 9 and 10 report each group’s participants’ statements about disadvantages of Wiki-based group collaboration. Themes in the participants’ responses about disadvantages in Wiki collaboration included:

- Hard to communicate.
- Harder to share ideas or details about specific part of the project.
- Not everyone worked on a timely basis.
- It wasn’t face-to-face.

Table 9

*Group 1 Survey Responses: Disadvantages in Wiki-Based Collaboration*

| Reflecting on your experience, what were the principle disadvantages of doing collaborative work with a Wiki? |
| not being able to communicate easily |
| I couldn’t talk to people face to face which was difficult at times. |
| no face-to-face collaboration |
| Difficult to get immediate feedback and difficult to respond to each other in timely fashion, since few of us are online all the time |
| it was hard to get a good over view of what we were doing |
| you had to be really good at writing what is easier to say |
| Not everyone worked timely. |
| Everyone could just put it off |
Table 10

*Group 2 Survey Responses: Disadvantages in Wiki-Based Collaboration*

<table>
<thead>
<tr>
<th>Reflecting on your experience, what were the principle disadvantages of doing collaborative work with a Wiki?</th>
</tr>
</thead>
<tbody>
<tr>
<td>When we worked solely through the Wiki, it was difficult.</td>
</tr>
<tr>
<td>it was difficult to organize thoughts and sometimes technical issues got in the way.</td>
</tr>
<tr>
<td>hard to communicate and make sure people had a firm understanding of what you were talking about</td>
</tr>
<tr>
<td>It seemed harder to discuss or have a conversation to explain in greater detail a specific part of the project. Although people had ample opportunities to contribute to the Wiki, no one responded to post I made.</td>
</tr>
<tr>
<td>hard to get a hold of people and make sure people were checking the Wiki</td>
</tr>
<tr>
<td>That it wasn’t face to face!</td>
</tr>
<tr>
<td>It’s harder to throw ideas around. It relies more on people checking in often and saying what they think. Or one person can take charge.</td>
</tr>
</tbody>
</table>

In the final interviews, participants confirmed these themes about obstacles in Wiki collaboration. In addition, respondents mentioned other disadvantages, especially in their situation as college students:

And so I think that the postproduction [final editing] went really well on the Wiki but the production of the actual rough draft went, I thought, pretty horribly on the Wiki just because we could put it off and not worry about it. It’s online like email and doesn’t seem as important as if you’re sitting with someone talking face to face. (Participant 1)
I think because it relies on people signing in and checking it, it takes some steps. It would be like a conversation that might take 45 minutes to half an hour now takes a day because each person has to wait for the other person to respond.

(Participant 9)

As a student you only end up doing it [checking the Wiki] once a day, and if nothing’s done that day, well maybe you check the next day, or do you wait until the day after that? It depends on how close it is to the project being due.

(Participant 1)

Some of the obstacles I encountered on the Wiki were people not responding. After I first posted some things on Wiki and after no one responded after 2-3 days I sent everyone an e-mail in which I received two e-mails back asking me what assignment I was even talking about and I could explain it to them. (Participant 5)

Group Collaboration Characteristics

After each group assignment, the surveys taken by every member of the study included 15 items related to characteristics of group collaboration and report characteristics, regardless of the collaboration method. Table 11 shows the results by item for the two methods of collaboration. Table 12 reports the means of the survey totals for these items.

Of the 15 items in the collaboration section of the surveys, only two items had statistically significant differences between the two methods. Wiki-based collaboration scores were significantly lower for items number 1 (“I understood the objectives of this
Table 11

*Collaboration Survey Mean Scores by Collaboration Method*

<table>
<thead>
<tr>
<th></th>
<th>Method</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p (two-tailed)</th>
<th>t</th>
<th>p (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I understood the objectives of this assignment.</td>
<td>Face</td>
<td>4.33</td>
<td>.617</td>
<td>2.256</td>
<td>.032</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.80</td>
<td>.676</td>
<td>1.852</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I understood my individual responsibilities in this assignment.</td>
<td>Face</td>
<td>4.27</td>
<td>.594</td>
<td>2.87</td>
<td>.776</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>4.20</td>
<td>.676</td>
<td>1.060</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I was serious about making the group work successfully.</td>
<td>Face</td>
<td>4.27</td>
<td>.594</td>
<td>1.911</td>
<td>.370</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>4.20</td>
<td>.676</td>
<td>1.060</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>All the other members of the group were serious about making the group work successfully.</td>
<td>Face</td>
<td>3.53</td>
<td>1.060</td>
<td>2.430</td>
<td>.022</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.20</td>
<td>.941</td>
<td>1.852</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Our group was task-oriented.</td>
<td>Face</td>
<td>3.80</td>
<td>.676</td>
<td>1.852</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.20</td>
<td>.676</td>
<td>1.852</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>I frequently contributed new information to the group assignment.</td>
<td>Face</td>
<td>3.47</td>
<td>.743</td>
<td>.287</td>
<td>.776</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.53</td>
<td>.915</td>
<td>1.468</td>
<td>.153</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The other members of my group respectfully listened to or read my input when offered.</td>
<td>Face</td>
<td>4.00</td>
<td>.756</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.60</td>
<td>.737</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Everyone’s quality ideas were respected.</td>
<td>Face</td>
<td>4.00</td>
<td>.756</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.60</td>
<td>.737</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>I frequently changed other group members’ information in the group assignment.</td>
<td>Face</td>
<td>4.00</td>
<td>.756</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.60</td>
<td>.737</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>All members of my group worked well together.</td>
<td>Face</td>
<td>3.73</td>
<td>.594</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.53</td>
<td>.743</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>I worked harder than most other members of my group.</td>
<td>Face</td>
<td>3.33</td>
<td>.488</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.13</td>
<td>.834</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Our completed work comprehensively covers the topic.</td>
<td>Face</td>
<td>3.93</td>
<td>.704</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>4.00</td>
<td>.756</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Our completed work includes a sufficient number of relevant references.</td>
<td>Face</td>
<td>3.93</td>
<td>.594</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.93</td>
<td>.799</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Our completed works spelling, punctuation, capitalization, and grammar are accurate and correct.</td>
<td>Face</td>
<td>3.87</td>
<td>.743</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiki</td>
<td>3.87</td>
<td>.743</td>
<td>1.983</td>
<td>.334</td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
Table 11 (continued)

*Collaboration Survey Mean Scores by Collaboration Method*

<table>
<thead>
<tr>
<th>Method</th>
<th>$M$</th>
<th>$SD$</th>
<th>$t$</th>
<th>$p$ (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>3.93</td>
<td>.799</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>Wiki</td>
<td>3.93</td>
<td>.704</td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

Table 12

*Group Collaboration Characteristics Total Scores by Method*

<table>
<thead>
<tr>
<th>Collaboration Method</th>
<th>$M$</th>
<th>$SD$</th>
<th>$T$</th>
<th>$p$ (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-Face</td>
<td>57.13</td>
<td>6.198</td>
<td>1.732</td>
<td>.094</td>
</tr>
<tr>
<td>Wiki</td>
<td>53.47</td>
<td>5.370</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Highest possible Total Score = 75

assignment”) and number 5 (“Our group was task oriented”). Although not statistically significant at a .05 level of probability, most of the remaining items did receive higher scores for face-to-face than for Wiki collaboration, and the total mean scores were higher for face-to-face at a level that was significant at a .10 level of probability.
Collaboration Method Preference

At the end of the study, participants were asked to indicate which collaboration method they preferred and why they preferred it. Figure 11 graphically indicates their preferences and Table 13 lists their responses.

A total of nine participants preferred face-to-face collaboration and five preferred Wiki collaboration; one person indicated a preference for both. There was a difference in preference between the groups. In Group 1, three times as many participants preferred face-to-face collaboration (6) than Wiki collaboration (2). Group 2’s members were equally divided, with three preferring face-to-face and three preferring Wiki, whereas the seventh person preferred both methods of collaboration. Table 13 reports the written survey responses of all of the participants indicating their preferences and reasons for their choices.

The most common theme expressed in the surveys by participants who preferred face-to-face collaboration was that communication was better, enabling them to organize and complete the project more efficiently. Some participants also indicated that the face-to-face group forced group members to contribute to the project. And two participants preferred the face-to-face method because it was more familiar, with one of them stating, “I am old fashioned and fear change.” The most common theme expressed by participants who preferred Wiki collaboration was that they were able to work on the Wiki at their own pace and at times they chose. The need for better communication and leadership was also expressed by two of the participants preferring Wiki collaboration. And one participant indicated that both methods have advantages.
Figure 11. Participants’ preferred method of collaboration by group
Table 13

Participants’ Written Survey Responses Stating Preferred Method of Collaboration and Reasons for Preferences

Which did you prefer—Wiki or face-to-face group—and why?

Study Group 1:

Face-to-face I it was easier to communicate and organize how the paper was going to be done

Face-to-face, I thought it had better communication and the paper was put together in a more timely fashion

Face to face, you knew what was going on better

Face to face because it forced us to meet and work. The project was not important enough to the group for the Wiki to work.

Face-to-face because it was more personal—it’s good to have a face with a name

Face to face because it is what I am used to.

Wiki . . . You can write at your own pace at your own time.

I personally prefer the Wiki group, because information can be added onto/edited at any time.

Study Group 2:

Face to face because we could judge our project better and get criticism faster and more effectively.

Face-to-face group because it seemed to force people to contribute.

Face to face because I am old fashioned and fear change.

Wiki with better communication would be preferable. If people are comfortable changing other’s work than the Wiki is better tuned to doing that. People also work when they can.

Wiki because it was more convenient time wise

Wiki. Except you really have to have a leader.

They both have the[ir] advantages and disadvantages, I can’t really choose one over the other at this point.
In addition to the written surveys, participants responded to questions in personal interviews or chose to submit written responses to the interview questions. As indicated in Table 14, 11 of the 15 study participants responded to the interview questions. The remaining 4 participants did not respond and could not be contacted after the end of the study.

Some of the interview questions were designed to have the participants compare their experiences of face-to-face collaboration with Wiki collaboration. The following responses reflect the views of the majority of the participants:

The principle differences included immediate communication and collaboration and group structure. The advantages of working face-to-face were that it was possible to get immediate input and conversation allowed us to more quickly refine our focus. The advantages of working through the WIKI were the experience of communicating through a new medium and enhancing our technical expertise. The biggest disadvantage to both was that whenever you are working with new people it is important to dedicate time to getting to know one another’s strengths and weaknesses. I preferred working face-to-face because it was an easy and efficient way to express each person’s individual input and therefore arrive at a much more viable product. (Participant 4)

I preferred working face-to-face because I felt like there was more community as well as more of an opportunity to discuss ideas and topics. I feel if people would
Table 14

*Participants’ Interview Questions Response Methods*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Interview Response Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>Personal Interview</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 3</td>
<td>Personal Interview</td>
</tr>
<tr>
<td>Participant 4</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 5</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 6</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 7</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 8</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 9</td>
<td>Personal Interview</td>
</tr>
<tr>
<td>Participant 10</td>
<td>No Responses</td>
</tr>
<tr>
<td>Participant 11</td>
<td>Personal Interview</td>
</tr>
<tr>
<td>Participant 12</td>
<td>No Responses</td>
</tr>
<tr>
<td>Participant 13</td>
<td>Submitted Written Responses</td>
</tr>
<tr>
<td>Participant 14</td>
<td>No Responses</td>
</tr>
<tr>
<td>Participant 15</td>
<td>No Responses</td>
</tr>
</tbody>
</table>

of [sic] contributed more to the Wiki it also would have provided good discussion and community. (Participant 5)

Face to face is easier to work with than on Wiki. The main differences were the communication processes were easier face to face. The only disadvantage of
online was the time we had to wait for email responses. I preferred face to face because we had that personal contact and could discuss problems we were each encountering. (Participant 6)

Face-to-face was easier because the people were there and you could communicate easily your ideas. WIKI was nice because of the convenience of being able to access it from wherever, but it seemed a lot harder to get the people to use the WIKI. If it was something we were using from the start of the semester on a daily/weekly basis, I think it would have been more successful, but I think some people were intimidated by it. I liked the WIKI and the use of it. (Participant 7)

The principal differences were that when you use the Wiki you lose the personal aspect of working directly with someone which I think may effect [sic] your dedication to the project. An advantage of the Wiki, however, is that you don’t have to worry about scheduling a meeting time with the group. Again, the disadvantage is that you lose the personal aspect and I think it makes it a little more difficult to communicate with one another because you have to wait until the others check their emails or log onto the Wiki in order to get a response. Therefore, the advantages of meeting face-to-face are that you can better communicate. A disadvantage to working face-to-face would be that you would have to work around everyone’s schedules so that you could meet. (Participant 8)
Wiki Collaboration

The “History” function is a resource available in most Wikis. It reports the time and date that each page of a Wiki was edited, allows users to view previous versions of each page, compares two versions to see the differences, and can be used to replace the current online page with an earlier version. In many Wikis, the History function also identifies the user who made each edit to a page. The History function of the Wiki used in this study was used to track participants’ use of the online Wiki for their assignments. Tables 15-17 report the Wiki editing activity that took place during the study.

Every time changes to a page are saved by the user, a new “version” of the page is created. As shown in Table 15, Group 2 used the Wiki’s editing function much more extensively than Group 1. Group 2 made over twice as many edits, or page versions (23 vs. 10) than Group 1. Although each group made only two Major Content edits, the members of Group 2 made several more edits than Group 1 in each of the other Content and Organization areas.

During each assignment, there were two deadlines: a rough draft was due midway through the assignment period, and a deadline for the final report at the end. For both groups, most of the new or edited content was posted on the Wiki by a participant who had gathered content from other group members outside of the Wiki and posted it online on one of the two due dates. In Group 1, Participant 1 posted the rough draft and Participant 3 posted the final report; in Group 2, Participant 4 posted both the rough draft and the final report. Tables 16 and 17 show the Wiki editing history for each group.
Table 15

*Wiki History Function Report: Wiki Editing Activity Totals by Group and Participant*

<table>
<thead>
<tr>
<th></th>
<th>Total Edits (Versions)</th>
<th>Content Edits</th>
<th>Organization Edits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Minor</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Study Group 1:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 1</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Participant 2</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Participant 3</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
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<td>Participant 8</td>
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<td>1</td>
</tr>
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</tr>
<tr>
<td>Participant 11</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Participant 12</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Participant 13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Group 1 Totals:</strong></td>
<td><strong>10</strong></td>
<td><strong>1</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td><strong>Study Group 2:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 4</td>
<td>10</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Participant 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Participant 6</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Participant 7</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Participant 9</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Participant 14</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Participant 15</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Group 2 Totals:</strong></td>
<td><strong>23</strong></td>
<td><strong>7</strong></td>
<td><strong>7</strong></td>
</tr>
</tbody>
</table>

Content Edits: Minor = a small number of spelling, punctuation and/or word changes; Medium = 1 or 2 paragraphs of information added or changed; Major = more than 3 paragraphs of content added or edited
<table>
<thead>
<tr>
<th>Page Version</th>
<th>Date</th>
<th>Time</th>
<th>Edited by</th>
<th>Edit Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 8</td>
<td>Start of Study</td>
<td>Various</td>
<td>Researcher</td>
<td>Wiki Administration and Setup</td>
</tr>
<tr>
<td>9</td>
<td>Apr 19</td>
<td>6:34 pm</td>
<td>Participant 1</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>10</td>
<td>Apr 19</td>
<td>6:34 pm</td>
<td>Participant 1</td>
<td>Minor—Format Editing</td>
</tr>
<tr>
<td>11</td>
<td>Apr 20</td>
<td>10:00 am</td>
<td>Participant 1</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>12</td>
<td>Apr 24</td>
<td>10:55 am</td>
<td>Participant 1</td>
<td>Major—Content: First Draft of Report posted; content from different Group members posted by this participant. This is due date for the first draft.</td>
</tr>
<tr>
<td>13</td>
<td>Apr 26</td>
<td>12:44 pm</td>
<td>Participant 2</td>
<td>Minor—Content Organization</td>
</tr>
<tr>
<td>14</td>
<td>Apr 26</td>
<td>12:44 pm</td>
<td>Participant 2</td>
<td>Minor—Content Organization</td>
</tr>
<tr>
<td>15</td>
<td>Apr 27</td>
<td>10:45 am</td>
<td>Participant 12</td>
<td>Medium—Content added</td>
</tr>
<tr>
<td>16</td>
<td>Apr 28</td>
<td>9:23 am</td>
<td>Participant 8</td>
<td>Medium—Content: Reference links added</td>
</tr>
<tr>
<td>17</td>
<td>Apr 29</td>
<td>9:14 pm</td>
<td>Researcher</td>
<td>Administration: Added deadline message</td>
</tr>
<tr>
<td>18</td>
<td>Apr 30</td>
<td>2:11 pm</td>
<td>Participant 3</td>
<td>Major—Content added: report text, reference links; content from different Group members posted by this participant.</td>
</tr>
<tr>
<td>19</td>
<td>Apr 30</td>
<td>2:17 pm</td>
<td>Participant 3</td>
<td>Medium—Content: additional report text and web links as references. This is Group 1’s final report.</td>
</tr>
</tbody>
</table>
Table 17

*History Function Report: Group 2’s Wiki Editing Activity*

<table>
<thead>
<tr>
<th>Page Version</th>
<th>Date</th>
<th>Time</th>
<th>Edited by</th>
<th>Edit Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td></td>
<td></td>
<td></td>
<td>Wiki Administration and Setup</td>
</tr>
<tr>
<td>6</td>
<td>Mar 28</td>
<td>4:18 am</td>
<td>Participant 4</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>7</td>
<td>Mar 28</td>
<td>4:32 am</td>
<td>Participant 4</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>8</td>
<td>Mar 28</td>
<td>12:37 pm</td>
<td>Participant 7</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>9</td>
<td>Mar 28</td>
<td>2:40 pm</td>
<td>Participant 9</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>10</td>
<td>Mar 28</td>
<td>2:46 pm</td>
<td>Participant 9</td>
<td>Minor—Listed his content topics</td>
</tr>
<tr>
<td>11</td>
<td>Mar 28</td>
<td>3:13 pm</td>
<td>Participant 9</td>
<td>Minor—Modified his content topic list</td>
</tr>
<tr>
<td>12</td>
<td>Mar 28</td>
<td>7:55 pm</td>
<td>Participant 4</td>
<td>Medium—Added another Group member’s content and posted a note about another member’s format</td>
</tr>
<tr>
<td>13</td>
<td>Mar 28</td>
<td>8:58 pm</td>
<td>Participant 9</td>
<td>Medium—Rewrote his major point sentences</td>
</tr>
<tr>
<td>14</td>
<td>Mar 28</td>
<td>11:34 pm</td>
<td>Participant 15</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>15</td>
<td>Mar 28</td>
<td>11:35 pm</td>
<td>Participant 15</td>
<td>Minor—Resaved without changes</td>
</tr>
<tr>
<td>16</td>
<td>Mar 29</td>
<td>2:31 am</td>
<td>Participant 15</td>
<td>Medium—added Content to her section</td>
</tr>
<tr>
<td>17</td>
<td>Mar 29</td>
<td>8:51 am</td>
<td>Participant 9</td>
<td>Minor—changed Content in his section</td>
</tr>
<tr>
<td>18</td>
<td>Mar 29</td>
<td>11:28 am</td>
<td>Participant 4</td>
<td>Minor—Project Organization</td>
</tr>
<tr>
<td>19</td>
<td>Mar 29</td>
<td>11:51 am</td>
<td>Participant 4</td>
<td>Major—Added new content in Introduction added content in 4 other Group members’ sections.</td>
</tr>
<tr>
<td>20</td>
<td>Mar 29</td>
<td>12:19 pm</td>
<td>Participant 4</td>
<td>Medium—Added another Group member’s content. This is due date for the first draft.</td>
</tr>
<tr>
<td>21</td>
<td>Apr 1</td>
<td>1:25 pm</td>
<td>Participant 4</td>
<td>Medium—Edited content and formats in another member’s section.</td>
</tr>
</tbody>
</table>

*(table continues)*
As mentioned above, although more members of Group 2 made edits on the Wiki, both groups relied on either one or two members to gather and post most of the content.

The survey that each group’s members took immediately following their Wiki collaboration assignment included 20 statements related to their use of the Wiki for the assignment and their opinions regarding characteristics of the completed assignment. The assignment characteristics were the key criteria professionals used in their evaluations of the quality of the reports. Participants responded to each of these statements using a 5-point Likert scale ranging from Strongly Agree to Strongly Disagree. Items 1-10 of Part 1 of this survey section and Items 1-3 of Part 2 addressed what are considered important

<table>
<thead>
<tr>
<th>Page Version</th>
<th>Date</th>
<th>Time</th>
<th>Edited by</th>
<th>Edit Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Apr 3</td>
<td>2:15 pm</td>
<td>Participant 4</td>
<td>Medium—Added content from an additional Group member</td>
</tr>
<tr>
<td>23</td>
<td>Apr 5</td>
<td>12:30 pm</td>
<td>Participant 6</td>
<td>Medium—Added content to her own section</td>
</tr>
<tr>
<td>24</td>
<td>Apr 5</td>
<td>12:32 pm</td>
<td>Participant 6</td>
<td>Minor—Edited format, font in her own section; minor content edit</td>
</tr>
<tr>
<td>25</td>
<td>Apr 5</td>
<td>12:34 pm</td>
<td>Participant 6</td>
<td>Minor—Edited format, font in her own section</td>
</tr>
<tr>
<td>26</td>
<td>Apr 5</td>
<td>12:35 pm</td>
<td>Participant 6</td>
<td>Minor—Resaved without changes</td>
</tr>
<tr>
<td>27</td>
<td>Apr 7</td>
<td>1:52 am</td>
<td>Participant 4</td>
<td>Major—Added content and corrected format, etc., in all the other Group members’ sections.</td>
</tr>
<tr>
<td>28</td>
<td>Apr 7</td>
<td>2:11 am</td>
<td>Participant 4</td>
<td>Minor—Project Organization. This is Group 2’s final report.</td>
</tr>
</tbody>
</table>
characteristics and capabilities of Wikis and their use (Wiki Tools). Items 4-10 of Part 2 addressed characteristics of the completed assignment (Project Characteristics). Tables 18 and 19 report the means for each item in the Wiki Surveys related to Wiki Tools and Project Characteristics respectively. Higher scores for the Wiki Tools items indicate more extensive use of major Wiki characteristics and capabilities.

As shown in Table 18, the participants’ use of Wiki tools was moderate, with the Wiki Tools total mean score at the “Neutral” level. The two items receiving the highest scores were the items indicating that participants had posted their own material on the course Wiki site and felt comfortable making changes to their own posted material. But these aspects of online work are common in other applications as well, such as threaded discussion boards and online bulletin boards. Whereas participants tended to agree with the statement, “I felt comfortable having other students edit content I had posted” ($M = 3.87$), participants tended to respond that they had not made corrections to other students’ work and did not feel comfortable editing other students’ online content. The relatively low scores on most of the other items in Table 18 indicate that few participants made use of a Wiki’s commonly-used capabilities such as adding new pages, adding links to other Wiki pages and Web sites, or using support tools such as the History function and Sandbox.

Scores for the specified characteristics of their projects, reported in Table 19, were higher, with the Project Characteristics total mean close to the “Agree” level. The participants felt that the content of their Wiki projects covered the assigned topics comprehensively and in a logical manner and reflected a thorough understanding of
Table 18

Wiki Collaboration Survey: Use of Wiki Tools

<table>
<thead>
<tr>
<th>Description</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1. I posted original content on the course Wiki</td>
<td>4.00</td>
<td>.655</td>
</tr>
<tr>
<td>1-2. I added new information to content posted by other students</td>
<td>3.07</td>
<td>.961</td>
</tr>
<tr>
<td>1-3. I made Content changes to material posted by other students</td>
<td>2.40</td>
<td>.828</td>
</tr>
<tr>
<td>1-4. I made Grammar/Language (spelling, punctuation, etc.) changes to</td>
<td>2.33</td>
<td>.816</td>
</tr>
<tr>
<td>material posted by other students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5. I added new pages to the course Wiki</td>
<td>2.93</td>
<td>.961</td>
</tr>
<tr>
<td>1-6. I added links from my page(s) to other course Wiki pages or to sites</td>
<td>2.60</td>
<td>.737</td>
</tr>
<tr>
<td>on the Internet/World Wide Web</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-7. I used the History function of the course Wiki site</td>
<td>2.87</td>
<td>.915</td>
</tr>
<tr>
<td>1-8. I used the online Help tools in the course Wiki site</td>
<td>2.87</td>
<td>.990</td>
</tr>
<tr>
<td>1-9. I used the SandBox of the course Wiki site</td>
<td>2.73</td>
<td>.799</td>
</tr>
<tr>
<td>1-10. In addition to the Wiki, I used online discussion boards, chat,</td>
<td>3.67</td>
<td>1.234</td>
</tr>
<tr>
<td>and/or instant messaging to communicate with other students about</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the group Wiki assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-1. When I thought material I had posted needed improvement, I felt</td>
<td>4.20</td>
<td>.676</td>
</tr>
<tr>
<td>comfortable making changes online</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-2. I felt comfortable having other students edit content I had posted</td>
<td>3.87</td>
<td>.640</td>
</tr>
<tr>
<td>2-3. When I thought original content posted by other students needed</td>
<td>2.93</td>
<td>1.033</td>
</tr>
<tr>
<td>improvement, I was comfortable editing their online content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiki Tools Total Means</td>
<td>3.0667</td>
<td>.46312</td>
</tr>
</tbody>
</table>

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree
Table 19

Wiki Collaboration Survey: Wiki Report Characteristics

<table>
<thead>
<tr>
<th>Description</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4. Our completed Wiki work comprehensively covers the topic</td>
<td>3.87</td>
<td>.743</td>
</tr>
<tr>
<td>2-5. Our completed Wiki work presents information in a logical manner</td>
<td>4.07</td>
<td>.458</td>
</tr>
<tr>
<td>2-6. Our Wiki work includes a sufficient number of relevant references</td>
<td>3.60</td>
<td>.910</td>
</tr>
<tr>
<td>2-7. Our Wiki work’s spelling, punctuation, capitalization, and grammar are</td>
<td>3.93</td>
<td>.704</td>
</tr>
<tr>
<td>accurate and correct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-8. The language of our Wiki work has a “neutral point of view” (natural</td>
<td>4.00</td>
<td>.655</td>
</tr>
<tr>
<td>tone, not opinionated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-9. Our Wiki work demonstrated a thorough understanding of important</td>
<td>3.93</td>
<td>.704</td>
</tr>
<tr>
<td>concepts and provides new insight that will be useful to students who are</td>
<td></td>
<td></td>
</tr>
<tr>
<td>interested in this field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-10. Our Wiki work demonstrates a thorough understanding of important</td>
<td>3.87</td>
<td>.834</td>
</tr>
<tr>
<td>concepts and provides new insight that will be useful to professionals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>involved in this field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiki Project Characteristics Total Means</td>
<td>3.8952</td>
<td>.59509</td>
</tr>
</tbody>
</table>

1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree

important concepts in the field. They also felt their grammar and other aspects of the writing were correct. In short, they were positive about the results of their work.

During the interviews at the end of the study, some participants elaborated upon one of the relatively unique characteristics of Wikis mentioned above, the ability for anyone to edit material that had been posted on the Wiki. One person mentioned looking at other people’s work on the Wiki and seeing that grammar and other things needed to
be changed, but he did not make changes. When asked why he did not make these changes, he replied,

I don’t know. I think probably it was because we had assigned an editor, someone to be an editor, so that kind of, I said “oh you know he’ll take care of that for us” but and again part of it’s laziness because you know when you assign someone a section and say “OK you cover the future of television” then if someone else is doing their section and you think that you should add something you’ve already done your part so you’re kind hesitant about you know like do I really need to do this work for someone else but you know I guess for the overall good of the project you probably should. (Participant 9)

Another participant expressed different considerations about changing other people’s work on a Wiki:

It would seem to bother me if I would edit someone’s grammatical mistakes, like if it was spelled wrong. I don’t know; I could have a problem editing that. But if we were all students it almost seems not that I wouldn’t do it, but it almost seems like a little insulting or bizarre editing another student’s work considering he’s a student as well; you know it’s not like if I was a teacher; of course I would go on to the web site and edit it because . . . Well if I was like a superior you, someone who was higher up like a boss, that’s a better analogy, or go over and talk among students, like say hey you can edit whatever I do, I can edit whatever you do as long as it’s for the betterment of the project, you know what I mean. We didn’t talk about that. (Participant 1)
Quality of Assignments

To evaluate the quality of the reports produced by each group, persons with current or recent professional experience in broadcasting known by the researcher were invited to read and evaluate the two reports related to their field of expertise. Assignment 1 addressed Radio, and Assignment 2 addressed Television. Although 10 professionals had agreed to evaluate the reports, only 4 returned evaluations. The researcher contacted the non-responsive experts by e-mail and telephone three weeks after sending the reports and again two weeks later. No additional reports were received. Of the four sets of evaluations received, one reviewer wrote narrative comments about the reports but did not submit the numerical scoring sheets. This reviewer’s evaluations could not be used in calculating the Quality Scores of the reports. Table 20 indicates the professional backgrounds of the reviewers who returned evaluations. Each reviewer evaluated both reports in their category.

Table 20

*Report Reviewers*

<table>
<thead>
<tr>
<th>Professional Background</th>
<th>Reports Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 Radio Station Manager, Broadcast Management Consultant</td>
<td>Radio</td>
</tr>
<tr>
<td>R2 Radio Producer, Station Management and Technology Consultant</td>
<td>Radio</td>
</tr>
<tr>
<td>R3 Television Production Manager, Director, Management Consultant</td>
<td>Television</td>
</tr>
<tr>
<td>R4 Radio Station Manager, Broadcast Management Consultant</td>
<td>Numerical scores not submitted for study</td>
</tr>
</tbody>
</table>
The quality of the assignments was determined through scoring of prescribed elements of the students’ reports by professionals in the fields addressed in the reports. Tables 21 and 22 compare the Quality Scores by evaluation item and total scores between the two methods of collaboration for the Radio report and the Television report, respectively.

Since the number subject matter experts rating the quality of the projects was small ($N = 3$), statistical significance of the scores was unlikely. Therefore standard statistical tests were not conducted. However, the results of these scores provide us with data to compare project quality between treatments and groups. As shown in Tables 21 and 22, for Assignment 1, the Wiki method report received a higher score, and for Assignment 2, the face-to-face method report received a higher score. In both assignments, Group 2’s report received a higher total score than Group 1’s report, regardless of the collaboration method used.

Regarding the individual Quality items, Table 21 shows that for Assignment 1, the Wiki group received twice as many higher scores (6) than the face-to-face group (3), and one score was the same for both groups. The items with higher scores for the Wiki group are:

- Item 1: Was the report comprehensive?
- Item 2: Was the information accurate?
- Item 3: Was the report organized in a logical manner?
- Item 5: Does the report have consistent style?
Table 21

Quality Scores of Radio Reports (Assignment 1). Group 1 = Face-to-Face Collaboration;
Group 2 = Wiki Collaboration

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Method</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was the report comprehensive?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3.5</td>
</tr>
<tr>
<td>2. Was the information accurate?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3.5</td>
</tr>
<tr>
<td>3. Was the report organized in a logical manner?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3.5</td>
</tr>
<tr>
<td>4. Is the paper coherent as a whole?</td>
<td>Face</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3</td>
</tr>
<tr>
<td>5. Does the report have consistent style?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3.5</td>
</tr>
<tr>
<td>6. Does the report include relevant references?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2</td>
</tr>
<tr>
<td>7. Does the report have accurate spelling, punctuation, capitalization, and grammar?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2.5</td>
</tr>
<tr>
<td>8. Does the report’s language have a “neutral” point of view (factual in tone, not</td>
<td>Face</td>
<td>2.5</td>
</tr>
<tr>
<td>opinionated)?</td>
<td>Wiki</td>
<td>3</td>
</tr>
<tr>
<td>9. Does the report demonstrate a thorough understanding of important concepts and</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td>provide new insight?</td>
<td>Wiki</td>
<td>3</td>
</tr>
<tr>
<td>10. Is the report useful?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Total Quality Score
(Highest possible score = 40)

<table>
<thead>
<tr>
<th>Method</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>28</td>
</tr>
<tr>
<td>Wiki</td>
<td>30</td>
</tr>
</tbody>
</table>
Table 22

*Quality Scores of Television Reports (Assignment 2). Group 1 = Wiki Collaboration; Group 2 = Face-to-Face Collaboration*

<table>
<thead>
<tr>
<th>Question</th>
<th>Method</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was the report comprehensive?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2</td>
</tr>
<tr>
<td>2. Was the information accurate?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3</td>
</tr>
<tr>
<td>3. Was the report organized in a logical manner?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>1</td>
</tr>
<tr>
<td>4. Is the paper coherent as a whole?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2</td>
</tr>
<tr>
<td>5. Does the report have consistent style?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>1</td>
</tr>
<tr>
<td>6. Does the report include relevant references?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3</td>
</tr>
<tr>
<td>7. Does the report have accurate spelling, punctuation, capitalization, and grammar?</td>
<td>Face</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>1</td>
</tr>
<tr>
<td>8. Does the report’s language have a “neutral” point of view (factual in tone, not opinionated)?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>3</td>
</tr>
<tr>
<td>9. Does the report demonstrate a thorough understanding of important concepts and provide new insight?</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2</td>
</tr>
<tr>
<td>10. Is the report useful?</td>
<td>Face</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Quality Score</strong></td>
<td>Face</td>
<td>23</td>
</tr>
<tr>
<td>(Highest possible score = 40)</td>
<td>Wiki</td>
<td>20</td>
</tr>
</tbody>
</table>
Item 7: Does the report have accurate spelling, punctuation, capitalization, and grammar?

Item 8: Does the report’s language have a “neutral” point of view (factual in tone, not opinionated)?

The Assignment 1 items with higher scores for the face-to-face group are:

- Item 4: Is the paper coherent as a whole?
- Item 6: Does the report include relevant references?
- Item 10: Is the report useful?

Both treatments received the same score on:

- Item 9: Does the report demonstrate a thorough understanding of important concepts and provide new insight?

As shown in Table 22, for Assignment 2 the face-to-face group had a greater number of higher scores (3) than the Wiki group (2), and that scores for 5 items were the same for both groups. The items with the higher scores for the face-to-face group are:

- Item 3: Was the report organized in a logical manner?
- Item 5: Does the report have consistent style?
- Item 10: Is the report useful?

The assignment 2 items with the higher scores for the Wiki group are:

- Item 2: Was the information accurate?
- Item 6: Does the report include relevant references?

The groups received identical scores on the remaining items:

- Item 1: Was the report comprehensive?
• Item 4: Is the paper coherent as a whole?

• Item 7: Does the report have accurate spelling, punctuation, capitalization, and grammar?

• Item 8: Does the report’s language have a “neutral” point of view (factual in tone, not opinionated)?

• Item 9: Does the report demonstrate a thorough understanding of important concepts and provide new insight?

As noted above, regardless of treatment, on both assignments Group 2 received higher total Quality scores and higher scores in more individual items than Group 1 received.

As shown in Figure 12, the professionals’ scores for both groups were higher for the first assignment, the Radio reports, than for the second assignment, the Television reports. Because of differences in the subject matter, different professionals evaluated the Radio reports than those who evaluated the Television reports. The lower scores for the second assignments may be caused, at least partly, by different evaluation standards of the reviewers. Even though the scores for both groups are lower for the second assignment, Group 2’s scores were higher than Group 1’s for both reports, regardless of the collaboration method used. Even though the groups were randomized, it appears that they may not have been equivalent.
Figure 12. Professionals’ total scores for group reports

Learning and Community

The Classroom Community Scale was taken by participants three times: (a) as a Pretest to provide a Baseline measure, (b) after the face-to-face collaboration assignment, and (c) after the Wiki collaboration assignment.

The Classroom Community Scale (CCS) consists of 20 items scored on a 5-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree.” Total raw scores for the CCS vary from a maximum of 80 to a minimum of 0. The test instrument includes two subscales, Connectedness and Learning. The CCS subscale raw scores vary from a maximum of 40 to a minimum of 0. The Connectedness subscale is calculated by adding the weights of the odd-numbered items, that is, 1, 3, 5, 7, 9, 11, 13, 15, 17, 19. The
Learning subscale is calculated by adding the weights of the even-numbered items, that is, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. Higher subscale and total CCS scores are interpreted as a stronger sense of classroom community.

The CCS instrument includes items that are positive characteristics and those that are negative characteristics of classroom community. In scoring the test instrument, the items are weighted accordingly. Table 23 shows the weighting for the items.

Table 23

*Classroom Community Scale Item Scoring Weights*

<table>
<thead>
<tr>
<th>Items</th>
<th>Scoring Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 3, 6, 7, 11, 13, 15, 16, 19</td>
<td>0=Strongly Disagree; 1=Disagree; 2=Neutral; 3=Agree; 4=Strongly Agree</td>
</tr>
<tr>
<td>4, 5, 8, 9, 10, 12, 14, 17, 18, 20</td>
<td>0=Strongly Agree; 1=Agree; 2=Neutral; 3=Disagree; 4=Strongly Disagree</td>
</tr>
</tbody>
</table>

Tables 24 through 26 display the results, respectively comparing the baseline scores to face-to-face collaboration, the baseline scores to Wiki collaboration, and face-to-face collaboration to Wiki collaboration.

Analysis of the scores for each item, the Connectivity and the Learning subscales, and the total Classroom Community Scale did not indicate any statistically significant differences in scores of either collaboration method compared to the Baseline nor between the two methods at a .05 level of significance. There are, however, three items with significant differences at the .10 level of significance. Item 15 on Table 24 shows a
Table 24

*Classroom Community Scale Scores: Baseline and Face-to-Face Collaboration*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M$</th>
<th>SD</th>
<th>$t$</th>
<th>$p$ (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel that students in this course care about each other.</td>
<td>Baseline 2.33</td>
<td>.816</td>
<td>-1.522</td>
<td>.139</td>
</tr>
<tr>
<td></td>
<td>Face 2.80</td>
<td>.862</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I feel that I am encouraged to ask questions.</td>
<td>Baseline 2.80</td>
<td>.561</td>
<td>-1.517</td>
<td>.140</td>
</tr>
<tr>
<td></td>
<td>Face 3.13</td>
<td>.640</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I feel connected to others in this course.</td>
<td>Baseline 2.27</td>
<td>.704</td>
<td>-.887</td>
<td>.382</td>
</tr>
<tr>
<td></td>
<td>Face 2.47</td>
<td>.516</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I feel that it is hard to get help when I have a question.</td>
<td>Baseline 3.00</td>
<td>.756</td>
<td>-1.084</td>
<td>.288</td>
</tr>
<tr>
<td></td>
<td>Face 3.13</td>
<td>.640</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I do not feel a spirit of community.</td>
<td>Baseline 1.93</td>
<td>.799</td>
<td></td>
<td></td>
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<tr>
<td>7. I feel that this course is like a family.</td>
<td>Baseline 1.40</td>
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*(table continues)*
Table 24 (continued)

*Classroom Community Scale Scores: Baseline and Face-to-Face Collaboration*

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<th>M</th>
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<th>p (two-tailed)</th>
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<td>16.</td>
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<td>.900</td>
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<td>.516</td>
<td></td>
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<td>17.</td>
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Table 25

*Classroom Community Scale Scores: Baseline Wiki Collaboration*

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<th>$t$</th>
<th>$p$ (two-tailed)</th>
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<td>.561</td>
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<tr>
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<tr>
<td>6. I feel that I receive timely feedback.</td>
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<tr>
<td>12. I feel that this course results in only modest learning.</td>
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</table>

*(table continues)*
Table 25 (continued)

*Classroom Community Scale Scores: Baseline Wiki Collaboration*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>14. I feel that other students do not help me learn.</th>
<th>15. I feel that members of this course depend on me.</th>
<th>16. I feel that I am given ample opportunities to learn.</th>
<th>17. I feel uncertain about others in this course.</th>
<th>18. I feel that my educational needs are not being met.</th>
<th>19. I feel confident that others will support me.</th>
<th>20. I feel that this course does not promote a desire to learn.</th>
<th>Subscale: Connectivity</th>
<th>Subscale: Learning</th>
<th>Classroom Community Scale</th>
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<td>Baseline</td>
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<td>1.73</td>
<td>2.67</td>
<td>2.33</td>
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<td>2.73</td>
<td>21.93</td>
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<td>49.07</td>
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<td>2.13</td>
<td>2.60</td>
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</table>

$p$ (two-tailed)
Table 26

*Classroom Community Scale Scores: Face-to-Face and Wiki Collaboration*

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<th></th>
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<th>t</th>
<th>p (two-tailed)</th>
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<td>1. I feel that students in this course care about each other.</td>
<td>Face</td>
<td>2.80</td>
<td>.862</td>
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<td>.828</td>
<td>.648</td>
<td>.522</td>
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<tr>
<td>2. I feel that I am encouraged to ask questions.</td>
<td>Face</td>
<td>3.13</td>
<td>.640</td>
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<tr>
<td></td>
<td>Wiki</td>
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<td>1.517</td>
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</tr>
<tr>
<td>3. I feel connected to others in this course.</td>
<td>Face</td>
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<td>.516</td>
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<td></td>
<td>Wiki</td>
<td>2.40</td>
<td>.910</td>
<td>.247</td>
<td>.807</td>
</tr>
<tr>
<td>4. I feel that it is hard to get help when I have a question.</td>
<td>Face</td>
<td>3.13</td>
<td>.640</td>
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<tr>
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<td>5. I do not feel a spirit of community.</td>
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</table>

*(table continues)*
Table 26 (continued)

*Classroom Community Scale Scores: Face-to-Face and Wiki Collaboration*

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<tr>
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<th>p (two-tailed)</th>
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Subscale: Connectivity

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<tbody>
<tr>
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<td>Wiki</td>
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Subscale: Learning

<table>
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<td>Wiki</td>
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Classroom Community Scale

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<th>SD</th>
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<tbody>
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<tr>
<td>Wiki</td>
<td>49.40</td>
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</table>

Subscale: Learning
significantly higher score about “members of this course depend on me” after the face-to-face project when compared to the baseline score. And two items in Table 26 show significantly lower scores for Wiki collaboration in being able to get help and for feeling more isolated than in face-to-face collaboration. Overall, the results do not indicate a significant difference in the participants’ experience of classroom community with either method of collaboration.
CHAPTER V
SUMMARY AND DISCUSSION OF RESULTS

Introduction

Collaboration among people is becoming increasingly important as economic, social, and technological development accelerates globally. The Internet and World Wide Web enable interaction between and among people and organizations on a scale never before possible. This study was conducted to add to the understanding of potential methods of effective learning techniques to engage the new generation of technologically-savvy learners now in our schools. Specifically, this study examines differences, benefits, and difficulties of collaboration through online Wiki software. Wikis are web-based applications that have many characteristics typical of “Web 2.0” programs and services. Web 2.0 is also referred to as the “Read/Write Web” because of the interactive nature of its capabilities and many of its applications.

Summary of the Study

Collaboration is at the core of the assignments in this study. The method being studied was group collaboration through Web-based Wiki software, a form of collaborative software introduced in the 1990s and further developed largely through the Open Source software movement. The study was conducted with university students during a seven-week period in Spring 2006. Participants in the study, Junior and Senior Communication Arts majors concentrating in Radio/Television production, were regular
users of computers for both academic work and social communication, averaging 6-10 hours per week in each of these areas. The curriculum in the Radio/Television concentration includes several courses requiring hands-on use of computers and professional application programs to produce audio and video projects.

Before the start of the study, the researcher asked how many participants were familiar with Wikis. Several of the participants had heard of and used Wikipedia, the online open source encyclopedia. Most of them, though, either had never heard of Wikis or did not understand how Wikis worked.

Discussion of Research Question Results

Research questions 1 through 4 inquired about obstacles and benefits to collaboration that students experienced in both face-to-face and online Wiki-based group projects.

Research Question 1: What benefits to collaboration do students experience in face-to-face class assignments?

Because it was a familiar method they had experienced in other classes and educational settings, participants were acclimated to face-to-face group collaboration. Among the main advantages of face-to-face collaboration identified by the participants were better communication and sharing of information and opinions. It was easier to organize and structure work, and feedback was more immediate. Having set meeting times facilitated better work flow and accountability; it was harder to put off work until the last minute.
Research Question 2: What obstacles to collaboration do students experience in face-to-face class assignments?

Among the major disadvantages of this method of collaboration, several participants stated that having to meet at specific times and places was restrictive. Attendance problems were also an issue since some group members did not meet with or contribute to the work as frequently as the others. Another disadvantage expressed was the limited ability to see other group members’ contributions to the written assignment, or to see the work as a whole during development.

Research Question 3: What benefits to collaboration do students experience when using an online Wiki for class assignments?

Major advantages to Wiki collaboration expressed by participants included not having to follow a set time schedule; it was easier to work on the project on their own time. Group members could easily see one another’s work and make edits, if designated as the editor. And through the Wiki project, participants learned a new way of communicating.

Research Question 4: What obstacles to collaboration do students experience when using an online Wiki for class assignments?

The most frequently mentioned disadvantage to Wiki collaboration was that it was harder and less efficient to communicate and share ideas or specifics about the project in the Wiki environment. Not everyone’s work was done on a timely basis since there were not set times for meetings. And some participants saw as a disadvantage the fact that this was not as familiar a way of working as face-to-face collaboration.
The results of the collaboration surveys indicated significantly lower scores for Wiki collaboration compared to face-to-face collaboration on 2 of the 15 general group collaboration items measured in the surveys, “I understood the objectives of this assignment” and “Our group was task oriented.” Considering the contrast between the immediacy of communication in face-to-face settings and the delayed asynchronous nature of communication in the online Wiki environment, it can be expected that answering questions and resolving concerns would take longer with Wiki-based collaboration groups. Wiki projects should be designed to facilitate timely communication among participants about process questions and issues.

Research question 5: Is there a difference between Wiki group collaboration and non-Wiki group collaboration in terms of the quality of the final product?

When evaluating the quality of the work produced by the two methods of collaboration, the study indicated that for one report the Wiki method of collaboration received higher scores but that for the second report, the other method, face-to-face collaboration, received higher scores. This shows there was no significant difference due to treatment method. This finding is consistent with much of the research in educational technology. The equivalence of collaborative work produced through online computer software with work produced in conventional face-to-face learning environments supports the potential effectiveness of online Wiki collaboration in education which, because of current and future communication technologies and resources, is likely to involve increased collaboration with learners and subject matter experts separated geographically and by time, frequently on a global scale. The continued development and
mastery of online communication and collaboration skills by students in higher education, as well as students in all levels of education, will strengthen their ability to effectively participate in and become leaders in the increasingly global economic and social environment in which they will live.

Although the difference in Quality Scores between treatments on many of the individual items was small, one of the items with a larger difference was Item 5 in Assignment 1 for which the Wiki group received a much higher score (3.5 vs. 2 - out of 4) for consistency of style in the report. Even though some of the comments made by participants implied it was difficult for them to integrate their work using the Wiki, their results were superior to the other group in this criterion on Assignment 1.

In Assignment 2, the treatments were reversed for the two groups. The two Quality items with the greatest difference in scores were Items 3 and 5, logical organization of the report and consistency of style, respectively. For each of these, the face-to-face group received much higher scores than the Wiki group (3 vs. 1). For this assignment, Group 1 used Wiki collaboration.

The total Quality scores for each report were different between the two collaboration methods, although the same study Group, Group 2, received the higher Quality score for each report, regardless of which method they used. Both groups received lower scores from subject matter experts for the quality of their second assignments compared to their first ones. The reviewers of the first reports were different experts than those who reviewed the second reports. The different reviewers may have had different standards or perceptions of quality in evaluating the assignments, resulting
in the lower scores for the second reports. The difference in scores between the projects was not a crucial issue, however, since this study’s purpose was to compare collaborative approaches within a given project.

Another potential reason for both groups receiving lower quality scores for the second assignment is the timing of this project. The second collaboration project started immediately after the first and occurred during the final weeks of the academic term. One participant identified this as a possible cause for the lower scores in the second assignment by stating that “[the assignments] fell so close together and right at the end of the semester which made it more difficult to work in a group because everyone was overwhelmed with end of the semester assignments and seemed distracted from this one” (Participant 9).

For both reports, Group 2 received higher scores than Group 1 for the quality of their work, regardless of the collaboration method. Even though participants were randomly assigned to the two groups, demographic survey findings shown in Figure 8 in Chapter 4 indicate differences between the groups that may explain Group 2’s higher scores. Six of the seven members of Group 2 were Seniors and one was a Junior, whereas Group 1 had three Seniors and five Juniors. Collectively, then, Group 2 had more experience as college students, having more time to develop skills in organizing and writing papers and reports. Secondly, as shown in Figures 9 and 10, Group 2’s members made more extensive use of computers and the Internet for both academic work and social communication and planned to access the Wiki system from computers at their residences rather than use a university computer lab. This group was more likely to be
comfortable working on the assignments with computers, a particular benefit for Wiki collaboration. When expressing their collaboration method preferences, an equal number of Group 2’s members preferred Wikis as preferred face-to-face collaboration, whereas Group 1’s members preferred face-to-face over Wiki collaboration six to two. Other possible reasons for the difference between the groups’ results may be that the members of Group 2 had better writing skills, had an approach that resulted in more effective editing by a member or members of the group, or that their overall method of gathering and combining the information from individual members was more effective.

Research question 6: Is there a difference in students’ experiences of learning and sense of community after Wiki-based collaboration and face-to-face collaboration?

The results of the Classroom Community Scale (CCS) surveys indicate that students experienced a slightly higher level of both learning and a sense of community in the face-to-face collaboration environment than in Wiki-based collaboration. Overall, though, at a .05 level of significance, the differences between methods in the Connectivity and Learning subscales and the total CCS scale were not significant. At a .10 level of significance, 2 of the 20 individual items indicated a significantly greater sense of isolation and uncertainty about receiving help in the Wiki environment.

As noted earlier, Wiki-based collaboration was a new method of collaboration for all of the participants in this study. Because of the limited duration of this study, participants had to change from one method of collaboration to the other method immediately after the first assignment. In their survey and interview responses, some participants stated that, given more time for the projects and for working on the Wiki in
general, the problems they experienced could be solved as people got more familiar with working in the Wiki environment. Taken as a whole, the closeness of scores in the CCS suggest that, in spite of the difficulties with Wiki-based collaboration expressed by the participants, with more time and experience using Wikis, students are likely to find that Wikis provide a positive environment for learning and connectivity that is as effective as the more familiar face-to-face approach.

Group Collaboration and Wikis

As reported in participants’ written survey responses and several answers to the interview questions, both groups used the Wiki primarily as a web site on which one member of the group posted the other group members’ content at the times when the rough drafts and final reports were due. As reported in Chapter 4, all of the major content changes on the Wiki consisted of posting content gathered from other group members beforehand using other methods. There were also a limited number of minor and medium content changes made by only a few other participants to their own sections but not to other group members’ content. Regardless of the collaboration method used, the groups divided the report topics into separate sections and determined which group member would be responsible for researching and writing each section of the content. In each group, one member volunteered or was designated to collect and combine the content from the other members into the final report. Although the procedures used for editing in face-to-face collaboration are not reported, The Wiki History reports for each group indicate there was very little online collaboration and editing by the majority of the study participants, with 5 of the 15 total participants not making any edits at all. Participants
reported using “divide and conquer” and copy and paste approaches to collaboration on both the face-to-face and Wiki-based assignments. Table 15 shows that Group 2 had more than twice as many edits on the Wiki than Group 1, but with both groups most of the edits were made by one or two members who posted content for the whole group that had been gathered outside of the Wiki. Other than these “editors,” most participants did not make changes, and those who did add or edit content limited themselves to their own assigned content areas. During the interviews and discussion, some of the participants said they might make changes on a Wiki in their own content sections, but were not comfortable with the idea of making changes in other persons’ work on the Wiki. In summary, there is no evidence of either group using the Wiki to develop, edit, and finalize their assignment through active online participation by all of the group members adding and editing content in the report.

Wikis can be useful tools for group collaboration not only among persons separated by distance, sometimes involving major time zone differences, but also by persons who are located in the same geographic area who have different schedules and prefer the ability to determine the best times for their participation. Wikis give everyone involved direct access to the current version of a document or other project and enable them to revise and modify the document or project in real time so that other members of the team will see and be able to work with the revised version. Wiki pages and documents can also be easily returned to earlier versions in case errors have been made. Wikis’ core capabilities—allowing each collaborator to determine the best times to participate, providing real-time access to the current version which incorporates
everyone’s input and editing, the ability for anyone to edit any part of the project in light of their expertise, and the ease of returning to earlier versions—are very useful for group collaboration in a variety of situations and applications.

Although Wikis can be used primarily as web sites to post documents and information developed through other processes, students and others new to Wikis need training in and experience with the process of collaboration through shared group creation and editing of content on a Wiki. Teachers and project leaders also need to explain and utilize appropriate evaluation and assessment methods that reflect the change from individual writing and sense of ownership of Wiki content to shared authorship in which the group members jointly and interactively develop the end product. Group members should be told and affirmed during the Wiki process that their input and modifications throughout the Wiki are valuable contributions to the project, regardless of the source of the original material. Finally, new Wiki users need sufficient time and opportunity to try out, learn, and practice using Wiki software in one or more non-assessed introductory projects that logically and specifically require multiple users to make changes to the same parts of a document, data set, or other material. New users could be assigned to gather information and data directly related to the course’s field of study and add their information to the Wiki site, changing the existing totals to include their data. Each new user would thus experience revising information that had first been provided by others, a necessary process to ensure that the outcome was accurate and complete. After having the opportunity to learn and use a Wiki through introductory activities, new users should feel more comfortable using this resource for collaboration
and have a better understanding of shared content creation and editing, resulting in better Wiki collaboration than they would have experienced without the trial Wiki project. Another way to improve potential Wiki collaboration in a classroom or business setting is to use a Wiki for a new type of project or activity which by its nature will clearly benefit from use of Wiki collaboration and for which processes and procedures are not already established. It is often easier and more effective to introduce a new method when the process and desired outcome are different than something that already exists. Rather than start a Wiki project with empty pages, some initial content should be posted by the teacher or leader which participants can edit and expand upon. And a “core” group of contributors and editors could be part of the group, modeling and engaging in regular Wiki editing to keep the project dynamic, encouraging greater activity and participation by other participants.

Integrating the Wiki with other technologies or processes used regularly by the participants could lead to more frequent and productive use of the Wiki. For example, in a work setting an on-screen notification could appear on a user’s workstation whenever changes were made on the Wiki. For students and others who typically move among different locations, notifications of changes could be automatically sent to their e-mail addresses and/or their cell phones. Although the extent of participants’ use of e-mail was not measured in this study, based on their comments and the researcher’s observations, using Wiki software that would automatically e-mail group members whenever a change was made to the Wiki would likely improve students’ use of the Wiki, reducing the number of times users went to the Wiki site and found that no changes had been made.
By receiving timely notification through a resource they used more often, students’ awareness of the Wiki would be increased. In a classroom setting, another way to increase Wiki participation is to establish and communicate evaluation criteria based on the number, frequency, and nature of Wiki contributions and changes made by each student. Expected participation levels should be established and results reported at regular intervals during the Wiki project to encourage ongoing participation.

An essential consideration also likely to increase the utility of Wikis for class collaboration is to use Wikis for projects in which the process and intended outcome will clearly benefit the students using this method. The subject matter may be dynamic, requiring updated information from different users during the project. A very effective technique is to involve students and/or subject matter experts from different geographic areas in which online collaboration is the most efficient, effective, and practical method of interaction. By considering and implementing the activities discussed in this section, students and other new users are likely to better understand Wikis and the Wiki process and be willing to actively use Wikis for successful group collaboration.

As reported in Chapter 4, the demographic surveys indicated that the participants in one of the groups in the study, Group 2, made more extensive use of computers and online communication for both academic work and social communication than the members of the other group. All the members of the group that included the heavier users of computers indicated they were planning to work on the Wiki project at their residences, and most of the members of the other group planned to use computer labs at the university for their Wiki work. These differences suggest that computers and
computer-based communication are more integrated into the lives of Group 2. It was this group of more extensive computer users that was split evenly on their preference for Wiki-based collaboration compared to face-to-face collaboration, whereas most of the members of the other group preferred face-to-face communication. By chance, the group that had the heavier computer users was the first group to do their assignment in the study using the Wiki. It is possible that the members of this group were able to more easily use the software to determine and implement the approach they used for collaboration on the first assignment in the study. For this group, the Wiki software may have simply been another computer resource they used to complete the class assignment. But for the participants who used computers and online communications less extensively, and chose or had to go to an academic computer lab to work on this project, the Wiki software and Wiki collaboration may have been more difficult because they did not have as much technological experience or activity as the other participants.

Rather than utilize most of the defining capabilities of the Wiki to create and commonly edit an online document, however, participants used the Wiki as a method of assembling separate sections prepared by the individuals in the groups in time to meet the assignment deadline. There was relatively little editing of the online reports, and that was done by members of the groups who agreed to perform that task. As used by the participants, the Wiki’s primary role was to provide a more convenient way to assemble material rather than having the groups physically meet to gather information. As one participant stated, “it was more of a ‘divide and conquer’ method with 2 or 3 people working together on each section rather than all of us working together.” Another
participant stated “It became more efficient to have one person operating the WIKI [sic] and making revisions while the rest of the group reported through email.” These are examples of adapting and using a new technology’s capabilities for an old task.

For most of the participants in the study, learning how to use the online Wiki software was not difficult. The software built on their existing knowledge of word processing and online communication. The few difficulties expressed about Wiki collaboration, namely difficulty in getting help and a slight feeling of isolation in the course, would likely be corrected with more extended use of the Wiki software and Wiki collaboration, perhaps during an entire semester or academic year. And by having a longer period in which to use the Wiki to develop and complete assignments, Wiki users would be more likely to apply and use more of the characteristics and capabilities of Wiki software that, compared to other collaborative resources, are somewhat unique, such as the history function and the ability of anyone to edit material that is already posted, as well as communicate to other members of the group that it is acceptable and expected that they will edit one another’s work for the success of the project. This last point relates to individual authorship. Individual authorship is a strong tradition within education, as well as other areas of life, and participants need to specifically give other members of the group permission and encouragement to edit one another’s online contributions. Once these points are addressed, group members may experience the same freedom they may experience when commenting on or critiquing ideas and material in appropriate face-to-face settings. Since shared authorship is a new concept though, students must be taught and encouraged to follow this new approach to group collaboration.
Overall, most of the study’s participants (9) preferred face-to-face collaboration rather than Wiki-based online collaboration (5), with one participant indicating “both.” They said they felt more familiar with face-to-face collaboration and were able to communicate with one another more effectively in that setting. Another factor is resistance to change, a common response to adopting new ways of doing things. As one participant wrote, they preferred “face to face because I am old fashioned and fear change.”

All of the participants in the study were upper division students, either juniors or seniors, in the communication arts major at the university where the study was conducted. During the course of their studies, students in this department are frequently involved in collaborative group projects. In addition to department specific projects, students at this university are often involved in a variety of collaborative projects and activities for their other classes, as well as extracurricular and social activities. They are familiar with group collaboration in face-to-face settings. None of the participants in the study, however, had any experience with collaboration online through Wiki software. As shown in the results of the study, after their limited exposure to Wiki collaboration, two-thirds of the participants expressed preference for the more familiar face-to-face method of collaboration. Preference for a familiar method would be expected. It is important to note, however, that even with limited experience with Wiki collaboration, one-third of the participants indicated a preference for online group collaboration through Wiki software rather than the more familiar face-to-face collaboration. Considering that this was a new method of collaboration for all of the participants, the fact that one-third of
them stated their preference to Wikis over face-to-face collaboration is a positive indication for the potentially successful use of Wiki-based collaboration in higher education.

Limitations of the Study

The participants in the study were assigned randomly to one of two groups, but the resulting groups were not comparable in characteristics that may have affected the study’s results. The study was designed to compare the results of two different methods of group collaboration: online collaboration using Wiki-based software and interpersonal face-to-face collaboration. However, the results indicated that one of the study groups, Group 2, received higher scores in the quality of their assignments regardless of the collaboration method used. Group 2 did more posting and editing on the Wiki and had more members indicate a preference for Wiki collaboration than Group 1. To help control for variables in group members’ characteristics that may have affected the outcome of the study, assigning participants to the different study groups using stratified sampling rather than random sampling would have been useful. As reported in Chapter 4, genders were relatively equivalent between the groups, but there were noticeable differences in academic class levels, extent of computer and mobile technology use, and the locations they used computers for the study. By first determining which variable or variables to equally represent in each group, each participant would be identified as a member of a subgroup based on the variable or variables. Participants in each subgroup would then be randomly assigned to one of the study groups. This method would result in groups that were more comparable.
This study was conducted over a seven-week period, a relatively limited amount of time for participants to have experience in the Wiki collaborative environment. Each group spent 3-1/2 weeks collaborating with one another through each of the two methods. The participants did not have prior experience collaborating through Wikis and did not develop skills in using most of the tools that permit editing and refinement of Wiki projects. Another complication was the timing of the study. The second collaborative assignment occurred late in the semester when participants were facing deadlines in other classes in addition to the assignments in this study.

Due to unexpected delays in institutional approval of research with these subjects, the project started four weeks after it was originally scheduled to begin. Not only did that move the final assignment late into the semester, as noted above, but it also impacted the ability of scheduling personal interviews with each of the participants. Because of the limited time available, participants were given the option of submitting responses to the planned interview questions in writing if they could not schedule a personal interview. Seven of the 15 participants submitted responses in writing instead of participating in interviews. Four participants had personal interviews which were abbreviated because of time limitations. After the interviews, these four participants also took part in an unplanned group discussion with the investigator about their experiences during the study. Due to time limitations, not all of the interview questions were asked during the shortened interviews. The remaining four study participants did not submit written responses to the interview questions nor take part in interviews, even though they were contacted in person and by e-mail before the semester and the study concluded.
Since the duration of the project was limited and the Wiki environment was new to the participants, working with unfamiliar technology may explain the overall preference for traditional face-to-face collaboration.

The order in which the groups used the two different methods of collaboration may also have had an effect on the study. It is possible that members of the group that first collaborated face-to-face found their Wiki collaboration during the second assignment more difficult than what they had just experienced face-to-face, and felt more negative toward Wiki collaboration at the end of the study when they indicated their preference. Members of the group that collaborated first through the Wiki ended the study with the more familiar face-to-face setting and may have felt more positive about the study at the end. In their final surveys, the group that used Wiki collaboration for the first assignment is the group that was evenly split between members’ preference for Wiki collaboration or face-to-face, whereas the group that experienced Wiki collaboration second preferred face-to-face collaboration six to two.

The number of subject matter experts who evaluated the study assignments and gave the Quality Scores was too small to obtain scores that were likely to be statistically significant. Although a total of 10 subject matter experts had agreed at the beginning of the study to evaluate the reports, five for Assignment 1 (Radio) and five for Assignment 2 (Television), results were received from only four subject matter experts, with one of these providing only subjective comments without scoring the reports using the Quality Score rubric provided. E-mail was the method of communication agreed to by the investigator and the subject matter experts. Two weeks after sending the reports and
scoring sheets to the recipients, each subject matter expert who had not responded was contacted by e-mail by the investigator and again two weeks later, requesting that their scores be submitted.

The study’s participants were taking the same class at the same university, so the Wiki-only collaboration was an artificial element dictated by the research design. Outside of class, many of the participants interacted with one another socially and on other academic projects. Unlike the context of this study, Wikis will typically be used for online collaboration in situations where some or all of the participants are separated by time and/or distance, and personal face-to-face collaboration is not a practical option. The study potentially would have been more effective if it included participants from other geographic areas who could collaborate only through the Wiki.

Another limitation observed through the study was the absence of a clear, specific definition of “collaboration” and stated expectations for participants to work in common on the document for each assignment. Rather than allowing the “divide and conquer” or “cut and paste” approach of separate contributions simply being assembled at the end, defining and implementing more authentic collaboration should be incorporated in future studies.

Implications for Action

In this study of group collaboration among university Juniors and Seniors using an online Wiki, a successful collaborative participant is likely to be a Senior who uses a computer for academic work at a moderate level, averaging between 20 and 25 hours per week. This participant is likely to be male, and he uses a computer at his residence to
access the Wiki, making online activity more convenient and perhaps more frequent than it would be if the participant relied on using a campus computer lab. In most cases he also uses both computers and wireless devices such as a cell phone for social communication, totaling an average of 25-35 hours per week.

In this study, the most active Wiki participants volunteered or agreed to organize their groups’ division of the content and were responsible for collecting the material written by the other group members. They posted organizational information at the beginning of the Wiki assignment, and at deadlines posted content written by the other group members and made minor content and format changes. The participants’ specific collaboration processes outside of the Wiki were beyond the scope of this study. As reported earlier, little collaborative work was performed on the Wiki itself, the result of unexpected time limitations and limited participant experience.

The results of this study indicate there was no significant difference in the quality of the work produced by students collaborating through online Wiki software compared to face-to-face group collaboration, a method with which they were familiar. Even though using a Wiki for collaboration was new to the participants and the time they learned and worked with it was limited, they were able to use this online method effectively. It is reasonable to expect that with more practice, familiarity, and experience, students would find Wikis as effective as other methods of collaboration, even more so in situations requiring collaboration with people separated by time and distance.

Information technology and networking has changed business, government, and other institutions globally. Friedman (2005) identified three great eras of globalization:
Globalization 1.0, lasting from 1492 when Columbus sailed to America until around 1800. The dynamic force in this period was countries globalizing. Globalization 2.0 lasted from roughly 1800 to 2000. Multinational companies were the dynamic force driving globalization. Around 2000, according to Friedman, we entered a new era: Globalization 3.0. The dynamic force in this era is “the newfound power for individuals to collaborate and compete globally” (p. 10). New software applications and the global fiber-optic network enable individuals and groups to go global so easily. Friedman wrote, “Individuals must, and can, now ask, Where do I fit into the global competition and opportunities of the day, and how can I, on my own, collaborate with others globally?” (p. 10). Friedman also asserted that Globalization 3.0 will be driven by a much more diverse group of individuals, non-Western and non-White, who are being empowered in every corner of the world.

Carly Fiorina, former CEO of Hewlett-Packard, described the potential and likelihood of technology’s impact in the coming years, saying, “I think the last 25 years of technology are the warm up act” (2004a, ¶ 7),

And we are now entering the main event of technology’s ability to transform not just business, but life. I think that the dot-com boom and the dot-com bust were the end of the beginning, and we’re now at this main event, where technology truly will transform every aspect of society and life and certainly business. (2004b, ¶ 15)

Richardson (2006) stated that when today’s students enter their professional work lives, it is highly likely they will be expected to collaborate with others to create and
provide information for diverse and wide-ranging constituents. He contrasted these expectations with existing educational approaches oriented to individual performance and assessment. Educators need to prepare today’s students for their lives beyond the classroom. As online collaborative projects continue to increase in both education and business, Wikis may become a more widespread method of online group collaboration, especially for projects involving people working and collaborating from different locations. As networked communication systems and applications continue to develop and be applied more extensively in the corporate world, other online collaboration services may be used more than Wikis; but experience with collaboration through Wikis should be beneficial to workers and learners who can apply their experience to new online collaboration methods.

To successfully navigate global collaborative environments, people need to learn not only collaboration and technical skills, but also be prepared to work across cultures with persons who have different backgrounds, expectations, and customs of communicating and working. The use of Wikis may help students develop useful experience with cross-cultural collaboration.

Addressing educational administrators and teachers, educational technologist Tim Wilson asked,

What are you doing, or what will you be doing, for [your students] to prepare them to work seamlessly across cultures, with colleagues in France, Ireland, China and Australia, 24/7, across cultures in jobs that don’t even exist yet? How
are we preparing students today for that kind of work that will be here in ten short years? (2006)

Philosophical Issues Related to Wikis

The open editing philosophy of Wikis directly challenges the principle and practice of authorship, replacing the traditional approach of attributing published work to specific identified authors with work created and published through group collaboration, a collective process through which an individual’s contributions are subsumed into the group’s work. This shift affects not only the process of writing and developing new works, but also the value to an individual of participating in the development of the work, the ownership of content, legal responsibility for possible damages resulting from the work, and the ability to individually assess group members’ participation in Wiki projects. The open editing of Wikis also raises concerns about the quality and accuracy of the content and the potential for vandalism due to the open environment. And Wiki tools and processes can be implemented for projects ranging from local collaboration to truly global collaboration, bringing challenges and opportunities for interaction and cooperation across cultures and nationalities to achieve common objectives.

Elements of several of these issues were included in this research study and reported in previous pages. The first were related to open editing of content on the Wiki. Whereas there was little if any truly collaborative writing or editing evident on the Wiki itself, some participants discussed their hesitancy to edit Wiki content written by another person, a peer. They said editing other people’s work would be okay for a teacher or a boss, or by a group member who had been designated as an editor with the group’s
approval. But if they were not designated editors, they did not feel comfortable with the idea of editing their peers’ work, or said they did not make edits because it was not their job or role in the project. Further research on group collaboration through Wikis should clearly state expectations that participants will post and edit their own and one another’s work on the Wiki itself, discussing differences from the familiar author-based writing and development process. Wiki collaboration criteria should be established and measured using the Wiki’s History function. Qualitative data should also be collected to better identify and describe participants’ attitudes and behavior regarding collaborative authorship. The collaborative open authorship approach is a significant psychological and social change in the process of creating new information and needs to well-understood to implement effectively.

As mentioned earlier in this section, assessment of collaborative work, whether online through Wikis or using other methods, is a very important issue for educators, as well as leaders in business and other organizations. Traditionally, in education students are evaluated individually, with assessment and reports of each student’s learning based primarily on his or her individual work and achievement. Whereas assessment was outside the scope of this research project, participants were required to complete the surveys and provide input through interview questions. The extent and nature of each participant’s editing on the Wiki was reported and the differences between the members of the two study groups were discussed. Based on existing research, effective methods of assessing performance in collaborative groups frequently include training in and use of peer assessment as substantial parts of the evaluation process. Methods of tracking and
evaluating students’ contributions and collaboration through Wikis should be studied to help instructors assess students’ work. As with other forms of group work, it can be difficult to determine the degree and quality of each student’s participation in Wiki collaboration. Peer-assessment tools may be particularly useful as part of the overall assessment process. The need for appropriate assessment of group collaboration will become more important as interactive, collaborative applications become more common in students’ and working persons’ lives. Further research should continue developing and testing instruments and processes leading to effective assessment.

There are concerns about the accuracy of Wiki content developed through open editing rather than identified authorship and editing by professional editors. The optimistic view is that the commitment of members of the Wiki “community” creating and maintaining the project will keep the Wiki accurate, as well as minimize the effects of vandalism on the Wiki content. As noted by Grossman (2006), Wiki pages tend to represent consensus among participants and generate new ideas by integrating multiple points of view. Further research should study the responses of Wiki group members when inappropriate material is added to the Wiki. For example, researchers could post inaccurate or off-subject content, as well as inflammatory or otherwise inappropriate material, and record and report the group’s response. In addition to studies of this process, more research of the content of existing Wikis, having recognized subject matter experts assess the accuracy of the information, will help increase confidence in the Wiki process of collaboration and lead to greater acceptance of this method for appropriate projects and activities in education and other organizations.
Additional Recommendations for Future Research

Although specific Wiki software may be replaced in coming years by new applications, the collaboration experiences they provide will continue to be very beneficial to individuals and organizations. Future research plans should be made in light of the evolving applications of the Read/Write Web.

As noted earlier, future studies should be of sufficient duration for participants to become more skilled and comfortable with Wiki collaboration. Substantial experience with Wikis should be introduced before or as part of the research design so that the collaborative process itself rather than technical issues can be more clearly studied. And having participants from other geographic settings should be an essential part of the studies.

Since a growing percentage of younger persons use electronic devices and web sites for social communication and interaction, it would be interesting to study the use and effectiveness of Wikis or Wiki functionality placed in an online social networking site (MySpace, Facebook, etc.) versus the same program or functionality located in a formal online academic learning environment (Blackboard, Moodle, etc.).

It would be useful to study the effect of peer “change agents” in the online collaborative environment. In other words, how can Rogers’ model of the diffusion of innovation (Rogers, 1995) be applied to the adoption of new collaborative approaches in the classroom?

Another area to investigate is how to effectively use technology-based social networking applications and approaches in schools and educational settings. Is it possible
to bridge the growing information and interaction gap between schoolwork and students’
lives outside of school?

Finally, research in and implementation of collaborative resources such as Wikis
should be done with younger populations. Will younger students be more successful in
using new applications and technology than older persons? Even more importantly,
introducing the tools of the Read/Write Web in younger grades can be beneficial
throughout the lives of the students.

Conclusion

The collaborative environment that Wikis facilitate can teach students much about
how to work with others, how to create community, and how to operate in a world
where the creation of knowledge and information is more and more becoming a
group effort . . . Using Wikis, we can start to show our students what it means to
be a part of that process. (Richardson, 2006, p. 74)

Student group collaboration in education is not new, but the rapid growth of
computer technology and networking applications results in increased collaboration on,
literally, a global scale. Globalization of industries continues to accelerate, and
international corporations and government organizations are expanding ongoing
collaboration among their personnel and contractors throughout the world by using
information technologies and networking. Schools and other educational programs must
prepare learners for success by not only teaching about digital technologies and critical
perspectives persons should have, but also by providing creative opportunities for
students to use the new technologies (Buckingham, 2006, p. 6). Students will develop
important skills and learn effective methods of collaborative creation and synthesis of information that will apply to the wide variety of social, educational, and business settings in which they need to function. And when implemented effectively, the use of Wikis for online projects, reports and other documents can help learners become more critical users of online information and resources by experiencing the creation of online material themselves. Using the tools of the Read/Write Web, learners can actively contribute to the growing knowledge base of the World Wide Web, benefiting themselves and people around the world.
APPENDICES
I want to do research on the use of collaborative communication software in higher education to help understand effective implementation of interactive communication resources in education. This work is being done as part of my doctoral program in Instructional Technology at Kent State University. I would like you to take part in this project. If you decide to do this, you will be asked to complete a series of short online surveys and to participate in an individual interview. The interview will be audio taped so that my notes will be accurate. Altogether, the surveys should take a total of 45 minutes to complete. Individual interviews should take about 30 minutes. Analysis of data from the surveys and the interviews will not begin until final grades for the course have been submitted.

All participants in the study will remain anonymous in the dissertation and in reports and discussions of the study. If any names are included in the report, I will not use the actual names of the participants. Participants will not be described in sufficient detail to be identified.

If you take part in this project, you will help me identify factors such as students’ and teachers’ strategies, participation and course environment that can contribute to effective learning with emerging technologies. Taking part in this project is entirely up to you, and no one will hold it against you if you decide not to do it. If you do take part, you may stop at any time.

If you want to know more about this research project, please call me at 740.282.5521. You can also e-mail me at jcoyle@1st.net. My Kent State University advisor is Dr. Drew Tienne, his office telephone number is 330.672.0607. The project has been approved by Kent State University and Franciscan University of Steubenville. If you have questions about Kent State University’s rules for research, please call Dr. John L. West, Vice President and Dean, Division of Research and Graduate Studies, (Tel. 330.672.2704).

You will receive a copy of this consent form.

Sincerely,

James E. Coyle, Jr.
Doctoral Student - Instructional Technology

Consent Statement

I agree to take part in this project. I know what I will have to do and that I can stop at any time.

Signature __________________________ Date ____________

Educational Foundations and Special Services
P.O. Box 5190 • Kent, Ohio 44242-0001
(330) 672-2294 • Fax (330) 672-2512 • http://efss.kent.edu
Audio Recording Consent Form: Collaboration through Wikis

I agree to audio taping at ________________________________

On ________________________________

_____________________________   ________________________________
Signature                          Date

I have been told that I have the right to hear the audio tapes before they are used. I have decided that I:

_____ want to hear the tapes   _____ do not want to hear the tapes

Sign now below if you do not want to hear the tapes. If you want to hear the tapes, you will be asked to sign after hearing them.

James Coyle and other researchers approved by Kent State University may / may not use the tapes made of me. The original tapes or copies may be used for:

_____ this research project   _____ teacher education   _____ presentation at professional meetings

_____________________________   ________________________________
Signature                          Date

Educational Foundations and Special Services
P.O. Box 5190 • Kent, Ohio 44242-0001
(330) 672-2294 • Fax (330) 672-2512 • http://efsas.kent.edu
Online Survey 1—Both Group 1 and Group 2

What is your class status?
1. Freshman  
2. Sophomore  
3. Junior  
4. Senior  
5. Graduate student  
6. Not a student

Please select one:
1. Female  
2. Male

What is your major and concentration? (Check as many as apply)
1. Communication Arts - Radio/TV  
2. Communication Arts - Journalism  
3. Other - Please Specify: ___________________________________

What is your academic registration status this semester?
1. Full-time student (12+ hours)  
2. Part-time student  
3. Not a registered student

During the academic year, about how many hours per week do you spend in a typical 7-day week doing the following?

<table>
<thead>
<tr>
<th>Activity</th>
<th>0</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>More than 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a computer in class for academic work.</td>
<td></td>
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<tr>
<td>Using a computer outside of class for academic work.</td>
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<tr>
<td>Using the Internet (IM, chat, blogs, Facebook, MySpace, etc.) outside of class for social communication.</td>
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<tr>
<td>Use a mobile device (cell phone, wireless PDA, etc.) for social communication.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Where did you access the online Wiki for this assignment? (check all that apply)
1. My residence (dorm, apartment, home)  
2. On-campus computer lab  
3. Campus location(s) not computer lab  
4. Off-campus location not my residence - Please describe:
Describe any problems you encountered accessing and using the online Wiki from the location(s) you used. Enter None if you had none.

Where do you plan to access the online Wiki most frequently for future assignments in this class? (select one)
1. My residence (dorm, apartment, home)
2. Campus computer lab (Egan Hall, Cosmas & Damian, Library)
3. Campus location not a computer lab
4. Off campus location not my residence - Please describe:

List here any questions you have about accessing or using the class Wiki software. If you don’t have any, please enter None.

[Researcher’s note: The following instruction paragraph and 20 items included in this survey are Rovai’s Classroom Community Scale survey instrument, used with permission.]

Below is a series of statements concerning this course. Read each statement carefully and select the response that comes closest to how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe how you feel. Please respond to all items.
(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I feel that students in this course care about each other.
2. I feel that I am encouraged to ask questions.
3. I feel connected to others in this course.
4. I feel that it is hard to get help when I have a question.
5. I do not feel a spirit of community.
6. I feel that I receive timely feedback.
7. I feel that this course is like a family.
8. I feel uneasy exposing gaps in my understanding.
9. I feel isolated in this course.
10. I feel reluctant to speak openly.
11. I trust others in this course.
12. I feel that this course results in only modest learning.
13. I feel that I can rely on others in this course.
14. I feel that other students do not help me learn.
15. I feel that members of this course depend on me.
16. I feel that I am given ample opportunities to learn.
17. I feel uncertain about others in this course.
18. I feel that my educational needs are not being met.
19. I feel confident that others will support me.
20. I feel that this course does not promote a desire to learn.

Please add any comments to explain your responses (optional):
Online Survey 2—Group 1

Below is a series of statements concerning student collaboration in this course. Read each statement carefully and select the response that comes closest to your opinion about the project you just completed. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe your opinion. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

Cooperative Group Evaluation

1. I understood the objectives of this assignment.
2. I understood my individual responsibilities in this assignment.
3. I was serious about making the group work successfully.
4. All the other members of the group were serious about making the group work successfully.
5. Our group was task-oriented.
6. I frequently contributed new information to the group assignment.
7. The other members of my group respectfully listened to or read my input when offered.
8. Everyone’s quality ideas were respected.
9. I frequently changed other group members’ information in the group assignment.
10. All members of my group worked well together.
11. I worked harder than most other members of my group.
12. Our completed work comprehensively covers the topic.
13. Our completed work includes a sufficient number of relevant references.
14. Our completed works spelling, punctuation, capitalization, and grammar are accurate and correct.
15. Our completed work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.

[Researcher’s note: The following instruction paragraph and 20 items included in this survey are Rovai’s Classroom Community Scale survey instrument, used with permission.]

Below is a series of statements concerning this course. Read each statement carefully and select the response that comes closest to how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe how you feel. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I feel that students in this course care about each other.
2. I feel that I am encouraged to ask questions.
3. I feel connected to others in this course.
4. I feel that it is hard to get help when I have a question.
5. I do not feel a spirit of community.
6. I feel that I receive timely feedback.
7. I feel that this course is like a family.
8. I feel uneasy exposing gaps in my understanding.
9. I feel isolated in this course.
10. I feel reluctant to speak openly.
11. I trust others in this course.
12. I feel that this course results in only modest learning.
13. I feel that I can rely on others in this course.
14. I feel that other students do not help me learn.
15. I feel that members of this course depend on me.
16. I feel that I am given ample opportunities to learn.
17. I feel uncertain about others in this course.
18. I feel that my educational needs are not being met.
19. I feel confident that others will support me.
20. I feel that this course does not promote a desire to learn.

Please add any comments to explain your responses (optional).
Online Survey 2—Group 2

Below is a series of statements concerning student collaboration in this course. Read each statement carefully and select the response that comes closest to your opinion about the project you just completed. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe your opinion. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

Cooperative Group Evaluation

1. I understood the objectives of this assignment.
2. I understood my individual responsibilities in this assignment.
3. I was serious about making the group work successfully.
4. All the other members of the group were serious about making the group work successfully.
5. Our group was task-oriented.
6. I frequently contributed new information to the group assignment.
7. The other members of my group respectfully listened to or read my input when offered.
8. Everyone’s quality ideas were respected.
9. I frequently changed other group members’ information in the group assignment.
10. All members of my group worked well together.
11. I worked harder than most other members of my group.
12. Our completed work comprehensively covers the topic.
13. Our completed work includes a sufficient number of relevant references.
14. Our completed works spelling, punctuation, capitalization, and grammar are accurate and correct.
15. Our completed work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.

[Researcher’s note: The following instruction paragraph and 20 items included in this survey are Rovai’s Classroom Community Scale survey instrument, used with permission.]

Below is a series of statements concerning this course. Read each statement carefully and select the response that comes closest to how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe how you feel. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I feel that students in this course care about each other.
2. I feel that I am encouraged to ask questions.
3. I feel connected to others in this course.
4. I feel that it is hard to get help when I have a question.
5. I do not feel a spirit of community.
6. I feel that I receive timely feedback.
7. I feel that this course is like a family.
8. I feel uneasy exposing gaps in my understanding.
9. I feel isolated in this course.
10. I feel reluctant to speak openly.
11. I trust others in this course.
12. I feel that this course results in only modest learning.
13. I feel that I can rely on others in this course.
14. I feel that other students do not help me learn.
15. I feel that members of this course depend on me.
16. I feel that I am given ample opportunities to learn.
17. I feel uncertain about others in this course.
18. I feel that my educational needs are not being met.
19. I feel confident that others will support me.
20. I feel that this course does not promote a desire to learn.

Below is a series of statements concerning your experience with the Wiki projects in this course. Read each statement carefully and select the response that comes closest to your experience. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I posted original content on the course wiki.
2. I added new information to content posted by other students.
3. I made Content changes to material posted by other students.
4. I made Grammar/Language (spelling, punctuation, etc.) changes to material posted by other students.
5. I added new pages to the course wiki.
6. I added links from my page(s) to other course wiki pages or to sites on the Internet/World Wide Web.
7. I used the History function of the course wiki site.
8. I used the online Help tools in the course wiki site.
9. I used the SandBox in the course wiki site.
10. In addition to the wiki, I used online discussion boards, chat, and/or instant messaging to communicate with other students about the group wiki assignment.

Below is a series of statements concerning your experience with the wiki projects in this course. Read each statement carefully and select the response that comes closest to your opinion. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to best describe your opinion. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. When I thought material I had posted needed improvement, I felt comfortable making changes online.
2. I felt comfortable having other students edit content I had posted.
3. When I thought original content posted by other students needed improvement, I was comfortable editing their online content.
4. Our completed wiki work comprehensively covers the topic.
5. Our completed wiki work presents information in a logical manner.
6. Our wiki work includes a sufficient number of relevant references.
7. Our wiki work spelling, punctuation, capitalization, and grammar are accurate and correct.
8. The language of our wiki work has a neutral point of view (neutral tone, not opinionated).
9. Our wiki work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to students who are interested in this field.
10. Our wiki work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.

Please add any comments to explain your responses (optional).
Online Survey 3—Group 1

Below is a series of statements concerning student collaboration in this course. Read each statement carefully and select the response that comes closest to your opinion about the project you just completed. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe your opinion. Please respond to all items.
(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

Cooperative Group Evaluation

1. I understood the objectives of this assignment.
2. I understood my individual responsibilities in this assignment.
3. I was serious about making the group work successfully.
4. All the other members of the group were serious about making the group work successfully.
5. Our group was task-oriented.
6. I frequently contributed new information to the group assignment.
7. The other members of my group respectfully listened to or read my input when offered.
8. Everyone’s quality ideas were respected.
9. I frequently changed other group members’ information in the group assignment.
10. All members of my group worked well together.
11. I worked harder than most other members of my group.
12. Our completed work comprehensively covers the topic.
13. Our completed work includes a sufficient number of relevant references.
14. Our completed works spelling, punctuation, capitalization, and grammar are accurate and correct.
15. Our completed work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.

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Below is a series of statements concerning this course. Read each statement carefully and select the response that comes closest to how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe how you feel. Please respond to all items.
(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I feel that students in this course care about each other.
2. I feel that I am encouraged to ask questions.
3. I feel connected to others in this course.
4. I feel that it is hard to get help when I have a question.
5. I do not feel a spirit of community.
6. I feel that I receive timely feedback.
7. I feel that this course is like a family.
8. I feel uneasy exposing gaps in my understanding.
9. I feel isolated in this course.
10. I feel reluctant to speak openly.
11. I trust others in this course.
12. I feel that this course results in only modest learning.
13. I feel that I can rely on others in this course.
14. I feel that other students do not help me learn.
15. I feel that members of this course depend on me.
16. I feel that I am given ample opportunities to learn.
17. I feel uncertain about others in this course.
18. I feel that my educational needs are not being met.
19. I feel confident that others will support me.
20. I feel that this course does not promote a desire to learn.

Below is a series of statements concerning your experience with the wiki projects in this course. Read each statement carefully and select the response that comes closest to your experience. Please respond to all items.
(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I posted original content on the course wiki.
2. I added new information to content posted by other students.
3. I made Content changes to material posted by other students.
4. I made Grammar/Language (spelling, punctuation, etc.) changes to material posted by other students.
5. I added new pages to the course wiki.
6. I added links from my page(s) to other course wiki pages or to sites on the Internet/World Wide Web.
7. I used the History function of the course wiki site.
8. I used the online Help tools in the course wiki site.
9. I used the SandBox in the course wiki site.
10. In addition to the wiki, I used online discussion boards, chat, and/or instant messaging to communicate with other students about the group wiki assignment.

Below is a series of statements concerning your experience with the wiki projects in this course. Read each statement carefully and select the response that comes closest to your opinion. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to best describe your opinion. Please respond to all items.
(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. When I thought material I had posted needed improvement, I felt comfortable making changes online.
2. I felt comfortable having other students edit content I had posted.
3. When I thought original content posted by other students needed improvement, I was comfortable editing their online content.
4. Our completed wiki work comprehensively covers the topic.
5. Our completed wiki work presents information in a logical manner.
6. Our wiki work includes a sufficient number of relevant references.
7. Our wiki works spelling, punctuation, capitalization, and grammar are accurate and correct.
8. The language of our wiki work has a neutral point of view (neutral tone, not opinionated).
9. Our wiki work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to students who are interested in this field.
10. Our wiki work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.
1. Reflecting on your experience, what were the principle advantages of doing collaborative work with a wiki?

2. Reflecting on your experience, what were the principle disadvantages of doing collaborative work with a wiki?

3. Reflecting on your experience, what were the principle advantages of doing collaborative work in a face-to-face group?

4. Reflecting on your experience, what were the principle disadvantages of doing collaborative work in a face-to-face group?

5. Which did you prefer - wiki or face-to-face group - and why?

Please add any comments to explain your responses (optional).
Online Survey 3—Group 2

Below is a series of statements concerning student collaboration in this course. Read each statement carefully and select the response that comes closest to your opinion about the project you just completed. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe your opinion. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

Cooperative Group Evaluation

1. I understood the objectives of this assignment.
2. I understood my individual responsibilities in this assignment.
3. I was serious about making the group work successfully.
4. All the other members of the group were serious about making the group work successfully.
5. Our group was task-oriented.
6. I frequently contributed new information to the group assignment.
7. The other members of my group respectfully listened to or read my input when offered.
8. Everyone’s quality ideas were respected.
9. I frequently changed other group members’ information in the group assignment.
10. All members of my group worked well together.
11. I worked harder than most other members of my group.
12. Our completed work comprehensively covers the topic.
13. Our completed work includes a sufficient number of relevant references.
14. Our completed works spelling, punctuation, capitalization, and grammar are accurate and correct.
15. Our completed work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.

[Researcher’s note: The following instruction paragraph and 20 items included in this survey are Rovai’s Classroom Community Scale survey instrument, used with permission.]

Below is a series of statements concerning this course. Read each statement carefully and select the response that comes closest to how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select Neutral. Don’t spend too much time on any one statement, but give the response that seems to describe how you feel. Please respond to all items.

(Response choices on 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.)

1. I feel that students in this course care about each other.
2. I feel that I am encouraged to ask questions.
3. I feel connected to others in this course.
4. I feel that it is hard to get help when I have a question.
5. I do not feel a spirit of community.
6. I feel that I receive timely feedback.
7. I feel that this course is like a family.
8. I feel uneasy exposing gaps in my understanding.
9. I feel isolated in this course
10. I feel reluctant to speak openly.
11. I trust others in this course.
12. I feel that this course results in only modest learning.
13. I feel that I can rely on others in this course.
14. I feel that other students do not help me learn.
15. I feel that members of this course depend on me.
16. I feel that I am given ample opportunities to learn.
17. I feel uncertain about others in this course.
18. I feel that my educational needs are not being met.
19. I feel confident that others will support me.
20. I feel that this course does not promote a desire to learn.

1. Reflecting on your experience, what were the principle advantages of doing collaborative work with a wiki?

2. Reflecting on your experience, what were the principle disadvantages of doing collaborative work with a wiki?

3. Reflecting on your experience, what were the principle advantages of doing collaborative work in a face-to-face group?

4. Reflecting on your experience, what were the principle disadvantages of doing collaborative work in a face-to-face group?

5. Which did you prefer - wiki or face-to-face group - and why?

Please add any comments to explain your responses (optional).
APPENDIX C

INTERVIEW QUESTIONS
INTERVIEW QUESTIONS

1. Tell me what you think about the group projects in this course.

2. Why is that your response?

3. Sometimes in group projects the members of the group divide up the tasks to be accomplished, and each group member works on their part independently of the others. This is different than collaborating or working together on a project or task. With “Collaboration” defined as “the action of two or more people working together to create something,” on a scale of 1 to 10, with 10 being the highest, how effectively do you believe the members of your small group collaborated with one another on the assignments?

4. Why is that your response?

5. With the understanding of collaboration that I described earlier, on a scale of 1 to 10, how effectively do you feel you collaborated with the other members of your group on the class assignments?

6. Why is that your response?

7. Did you encounter any obstacles using the wiki to collaborate with other students? If so, what were they?

8. If you had any, how did you deal with obstacles using the wiki?

9. How would you compare the process of working face-to-face versus with a wiki? What were the principal differences? What were the advantages and disadvantages of each approach? Which did you prefer, and why?

10. Is there anything else you would like to add?
APPENDIX D

INTERVIEW QUESTIONS AND ANSWERS
INTERVIEW QUESTIONS AND ANSWERS

1. Tell me what you think about the group projects in this course.

Participant 1 (Oral): I thought, at first, the projects were kind of bizarre. At first I didn’t think it was very focused on telecommunications management, but then after we switched from the paper project to the Wiki project, when I started doing the Wiki, I started realizing just like how kind of frustrating it was to get a lot of people to actually get together and do something. Especially something that they might not be as motivated on as they should be. So I think that I got a lot more out of the course than any actual project, in the actual experience of being a group and getting people to get together and do something. And the Wall Street Journal was really cool. Another thing that I really did like about the project well, about the course, was how much emphasis [the instructor] put on the changing atmosphere [of the field], and I think that as college students we spend so much time learning about the atmosphere that we forget that four years from now it going to be completely different or two years from now it can be completely different; and so I thought that was a really good point for the course. I don’t feel I got as much from history and where things are now; I think that where things are going I got a lot more because of things like, oh, what’s that word, convergence. Convergence. Yeah.
Participant 2 (Written): This course relied a lot on group work, which I did not find to be challenging in a good way.

Participant 4 (Written): I think that both major projects were great lessons in teamwork and communication among colleagues. Additionally the projects were exceptional ways of gaining detailed overviews of television and radio in an efficient manner. One setback however was that there was no organized guarantee that all students would put forth an equal amount of work. Finally at sometimes there was a technological barrier when using the WIKI.

Participant 5 (Written): The group projects were challenging.

Participant 6 (Written): I like them.

Participant 7 (Written): I enjoyed the projects, I would have liked maybe a list of 10 topics that should be covered it would have helped on deciding what to write on.

Participant 8 (Written): I think the group projects were interesting in content and easy to compile at times, yet so difficult to compile at other times.

Participant 9 (Oral): I guess with the projects I was trying to focus on understanding where the industry is going, in what direction, understanding the new technology and the new applications for them so that any time when we’re involved in a project we can use them. But I guess the thing is, and part of this due to my own laziness too, or other people’s, I don’t know, but I still don’t think I understand them that well. So, I think the project, maybe it was a little too broad, because it was easy to try and cover a lot of things but nothing that in depth, and consequently I don’t think we really came out knowing that much more.
Participant 11 (Oral): I thought the projects coincided well with what we were studying—telecommunications. We did a lot of like research according to the topic at hand and it was interesting too to hear a project that covered not just what was current, which we did, but also history and the future. I thought that was most interesting.

Participant 13 (Written): I thought that the group projects in this course, overall, were a great learning experience. My group chose to delegate responsibilities as opposed to a complete collaboration. Either way you chose to do the projects, created a learning environment.

2. Why is that your response?

Participant 2 (Written): I do not feel that working in groups is a fair evaluation of each students work. It depends solely on what the students do collectively and if the group is not working together, it makes it difficult for all members of the group to share the same workload. Only once did I e-mail my group and actually get a response. This is probably in large part that each person thinks that “someone else will leave a response” and what happens is that no one does anything and the group’s communication suffers.

Participant 4 (Written): I think, like with any mode of education that there are advantages and disadvantages. The overall objectives of working together, learning about major mediums of communication, and creating a usable report were all successfully accomplished. However there are always ways of making a process more worthwhile.
Participant 8 (Written): That is my response because it was easier to work face-to-face rather than through the Wiki.

Participant 5 (Written): Because they fell close together and right at the end of the semester which made it more difficult to work in a group because everyone was overwhelmed with end of the semester assignments and seemed distracted from this one.

Participant 6 (Written): As I stated above, the group projects were very beneficial because it gave us a different form of communication. We learned that we had to work online for the Wiki and had no other choice.

Participant 7 (Written): I think that some subjects were overlooked, that could have been of importance.

Participant 13 (Written): This is my response because after each member of our group came with whatever their responsibility was then we would give it to the person whose responsibility it was to put it all together. After that was completed we all would take a look at it and make suggestions for changes and so on. So then, even if your responsibility was the history of T.V. you would have to review everything else.

3. Sometimes in group projects the members of the group divide up the tasks to be accomplished, and each group member works on their part independently of the others. This is different than collaborating or working together on a project or task. With “Collaboration” defined as “the action of two or more people working together to create something,” on a scale of 1 to 10, with 10 being the highest, how effectively do
**you believe the members of your small group collaborated with one another on the assignments?**

Participant 1 (Oral): When we did the group project person to person there was one person who stood up and took charge and it went really well because I think we were all really accountable to each other we were in group we were standing with each other in the classroom, we all could be there, we could all look each other, we could all see each other and we could all just like give input. But we all had to be there to listen to the input. And then also we had to set times who we were going to meet with, were we going to meet the next class period or were we going to meet like half an hour before or whatever we did. But we had to get together and we had to meet and so things really got done. On Wiki collaboration it seems to work together in different ways but I don’t think they worked as well getting things together. Because people such as me could just check their e-mail or go to the Wiki and if nothing was done they didn’t have to do anything. And actually, no, because even when someone did put something up there, no one really responded to it. I don’t know if people didn’t know where it was or people just didn’t pay attention to it. And then once an e-mail got sent out a couple of people responded to it, but even then by the time the rough draft was due, only half of the people in the group could actually put something in. Half of them e-mailing things to me and then the other half putting things; I think one or two people put things on the new Wiki. I wasn’t sure. But then it was it was really cool because after the rough draft was due the other half of the people actually went to the Wiki and put
those things up on the Wiki and the final copy actually came together really well because people could just put together on the Wiki, they didn’t have to sit down give it all to one person and let him type it up; as one person they could just integrate things on the Wiki. And so I think that the postproduction went really well on the Wiki but the production of the actual rough draft went I thought pretty horribly on the Wiki just because we could put it off and not kind of worry about it; just it’s online; e-mail doesn’t seem as important if you’re sitting with someone talking face to face.

Participant 2 (Written): Our group probably would score around a 7 on collaboration.

Participant 4 (Written): On a scale of 1 to 10, I give our group a 7. Overall, it seemed that each member was interested in the topics and motivated to complete the tasks at hand. Additionally, each member was timely in their responses and input. However, by virtue of the fact that for many of us, it was our first time working with one another, it was time consuming to break the ice and get down to the business of our tasks.

Participant 5 (Written): The members of my small group collaborated with one another at a level 5-6.

Participant 6 (Written): 6

Participant 7 (Written): 7

Participant 8 (Written): I would give our group a 7 for collaboration.

Participant 11 (Oral): As far as the definition is concerned, working together, I think our group was more dynamic working together on a project where you’re both really
into making something creative and excited about it. I think people saw this more as a classic chore to do, like the project, and we got it done sort of, but it wasn’t everybody’s favorite thing to do. We worked together but we worked together last minute. Like any college student would. So as far as that question I’d probably give it a 5 because we did work together, but not like we should have.

Participant 13 (Written): I would go as far as to say that our group’s rating on collaboration is a 9.5.

4. Why is that your response?

Participant 2 (Written): because as I’ve said before communicating was not ideal an often it was more of a “divide and conquer” method with 2 or 3 people working together on each section rather than all of us working together.

Participant 4 (Written): As in any work environment, it is important for co-workers to establish professional relationships and modes of order in collaboration. To be effective in producing viable reports it is necessary for individuals to work intensely together on various tasks in order to become comfortable with anticipating one another’s strengths and weaknesses and compensating accordingly.

Participant 5 (Written): I felt that on the Wiki it was more difficult to collaborate and really work together compared to discussing things face-to-face.

Participant 6 (Written): Because some members of the group did not participate as much as they should have and missed meetings that were crucial to our project being completed. It would have been ok if they let us know through e-mail or a phone
but never did that. We were just waiting for them to show up then were left hanging.

Participant 7 (Written): Some members of the group did not show up for many of the scheduled meetings, but some did. And the people that came to the meetings contributed and people were willing to do their fair share of the project.

Participant 8 (Written): That is my response because we did most of our work individually and then shared the info with the people in the group who had been designated to compile the paper, so I don’t feel like there was a lot of group interaction.

Participant 9 (Oral): I guess in terms of like really collaborating it wasn’t—it’d be lower, like maybe 3 or 4 just because I don’t know there was a lot of we came together and were, you know, how are we going to cover this subject, and one person would kind of take charge, but no one wanted to really take charge. Everyone was hoping it would be someone else and it just ended up being like we divided up, and then when it came time to talk about what everyone was covering, people might ask for help; they’d be, like, am I missing anything or do you know what needs to be done? No one would really give a lot of input. I mean, because I think some people knew things, like knew the subject better than others, but no they weren’t necessarily saying things. So there wasn’t a lot of, I think, progress in that area.

Participant 13 (Written): That is my response because almost everyone in the group carried their load. Only one person didn’t carry the load to the full extent. They
still carried their load; it just wasn’t at 100%. Both of our reports were very extensive and very informative. Everyone took their little part to make two great papers.

5. With the understanding of collaboration that I described earlier, on a scale of 1 to 10, how effectively do you feel you collaborated with the other members of your group on the class assignments?

Participant 2 (Written): I feel that my efforts for collaboration though sometimes fruitless, probably would get around a 7 or 8 as well.

Participant 4 (Written): On a scale of 1 to 10, I give myself an 8. I took the time to analyze our tasks and decided to take a leadership role in keeping the group on task. I also took the time to listen and encouraged others to give their input on the given topic. Lastly, I carried my share of the workload and was timely in doing so.

Participant 5 (Written): I feel I collaborated anywhere between an 8-10.

Participant 6 (Written): 7

Participant 7 (Written): 8

Participant 8 (Written): I would also give myself a 7 on how I collaborated with the group.

Participant 13 (Written): I feel as if my collaboration would be rated at 9.5 as well. I worked pretty hard on the first paper (I was the guy who put it all together) and felt that it was pretty good.
6. Why is that your response?

Participant 2 (Written): As I wrote in questions 3&4, collaboration usually consisted of a few people working in groups within the group. Also, a machine is only as good as its parts, so if one wheel isn’t doing its job, the rest of the machine having to compensate usually compromises quality.

Participant 4 (Written): I believe it is important for any organization to have some sort of leadership. A person or people who, by examples of service and organization, can lead others to become more efficient in their work. I see this as one of the most important aspects of task-oriented success. Additionally it is important for that leader or those leaders to be familiar and involved in the work being created.

Participant 5 (Written): The reason being that I made the first initiative and one of the only few on the Wiki to try and start discussion and ideas for the report. I also feel that I contributed to the in class discussions our group had in trying to generate ideas and initiatives.

Participant 6 (Written): Wiki was very confusing for me; I think that face to face was much easier. Just because we were all busy and had the tendency to push e-mails and papers back because we knew we could do it later.

Participant 7 (Written): I think that I communicated will with everyone and was sort of the driving force, more specifically during the second part of the assignment.

Participant 8 (Written): That is my response because, again, I just did research individually and then gave the info to the people designated to compile the paper and everyone else worked in this manner as well.
Participant 13 (Written): The reason it wasn’t a ten is because on the online portion I slacked a little bit. I still contributed my part to the group but my efforts were not as involved as the first one.

7. Did you encounter any obstacles using the Wiki to collaborate with other students?

If so, what were they?

Participant 1 (Oral): I think what I really brought up earlier about the lack of, um, the lack of motivation to do it and so to initially get things put together I felt like there was a lot of lack of motivation. Also, I think that it’s really significant, I think that having a thing in the corner [of the computer screen]; another thing that I think would be really cool, not like it’s a big deal to go to the Wiki, sign on the Wiki, click on group 1, and then click on Wiki and then go back and click on the post to see if there’s anything there, you do end up doing it once a day and then it’s frustrating because nothing’s happened after you do your stuff, then not like it’s a big deal, but I mean for me I had to go to the computer lab to do it, so I really would go out of my way to go to the computer lab to check if nothing’s happened; so, I think it would be really cool if Wiki had a program that would like somehow automatically tell the people when something changed. I’m sure it could get really annoying if each time something was done that the Wiki said, hey something was done to the Wiki, but I don’t know; somehow automatically update where people would know easier if something was done on a daily routine; like being in the corner of an office you know, but just being a daily routine. As a student you only end up doing it like once a day, and if nothing’s done that day,
well maybe do you check the next day or do you wait until the day after that? It depends on how close it is to the project being due.

Participant 2 (Written): The group projects in class participation when well and worked together well. As soon as I got on the Wiki I started having problems. The biggest difficulty was how to post something on Wiki after the class had made a final post.

Participant 3 (Oral): Due to e-mail; there was such a circulation of e-mails through the web page. It’s much more tempting, if you’re going to talk electronically, to talk by just going back on the system doing to e-mail to everybody in a group and doing that; just basically once the first person does that, it’s a matter of his clicking reply, reply all, you know what I mean? And so, in a way, the Wiki went up more just like a posting. It was a place to post our work and stuff, not so much as a place that we can actually work together towards the goal. One thing that I think would be something that a Wiki would be much more conducive is just a business where every computer is hooked up to a Wiki and all day long the Wiki’s kind of in the corner of the screen and it’s constantly on and new messages come in here. You’re adding on constantly, you’re saying stuff all day long to make sure everybody throughout the office is on the same page; I think it can be very conducive. Here, we’re checking our e-mail, that’s what’s going on. We’re going on, we’re checking our e-mail and if there’s a message from everybody else you know I replied to that and that’s the medium I worked through until posting time. I definitely can see it’s something I can definitely go on more. It’s kinda
strange; we’re studying here to go and work in a more business setting with telecommunications; although I can see where we should be treating this class like what’s going to happen in the business field down the road, which I can see Wiki as being something that works in businesses and stuff like that, and like I said, is in the corner of every computer screen inside an office building. But here it was so tempting by saying we can only work electronically, it’s so tempting to just grab onto and just use the standard e-mail. I think it’s very conducive too if you’re in a job setting that you’re always near a computer and it would be conducive. One thing I think, it was almost too much of a process to get to get into it. I think just one username and password would kind of suffice if you’re doing group work and stuff and I can see definitely in a business setting the guy getting there at the beginning of the day; he types in the one username and password and it just becomes almost like an open forum, almost like he’s able to do his own job while still being in like a constant meeting room throughout his day. You know stuff to get more specific, but literally it would keep everybody in an office on the same page and you would never get people working too much on one thing if they don’t have to; and just efficiency, I can see it working very very well.

Participant 4 (Written): Yes there were obstacles. In particular, it seemed that many of the members were unfamiliar with navigating through the WIKI. Additionally upload and revisions were a difficulty. Lastly immediate communication through WIKI was unavailable so changes to be made a times were slow and cumbersome.
Participant 5 (Written): Some of the obstacles I encountered on the Wiki were people not responding. After I first posted some things on Wiki and after no one responded after 2-3 days I sent everyone an e-mail in which I received two e-mails back asking me what assignment I was even talking about and I could explain it to them.

Participant 6 (Written): Not really

Participant 7 (Written): Just making sure people were logging on and doing their part was the biggest obstacle.

Participant 8 (Written): Obstacles with using the Wiki were mostly just making sure that everyone was doing something and getting the information posted or sent via e-mail in a timely manner to be compiled.

Participant 9 (Oral): Yeah I think there isn’t because it relies on people signing in and checking it; it takes some steps. It’d be like a conversation that sorta spanned out, like a conversation that might take 45 minutes to half an hour now takes a day [on the Wiki] because you have to wait for the other person to respond, and I mean I guess in an environment where you know that was maybe your job or maybe you know it was more emphasized, whereas like here we have other classes and have other things going on; you wait around and you might check it once a day, maybe twice if it’s coming close to the deadline, but it doesn’t happen that often.

Participant 13 (Written): Absolutely not it was very easy to work with.

8. If you had any, how did you deal with obstacles using the Wiki?

Participant 2 (Written): [The instructor] helped walk me through it.
Participant 4 (Written): For the most part we worked around these obstacles by using alternative forms of electronic communication like e-mail. It became more efficient to have one person operating the WIKI and making revisions while the rest of the group reported through e-mail.

Participant 5 (Written): I dealt with the obstacles by trying to explain the assignment to them and encourage them to participate in the Wiki and contribute their ideas.

Participant 6 (Written): The only problem I had was with the format and getting onto the site to post. I e-mailed [another group member] and she wrote right back on to post.

Participant 7 (Written): Contacting people through group e-mails.

Participant 8 (Written): I dealt with the obstacles in the Wiki simply by doing my research and sending it to the rest of the group and hoping that would also do the same.

Participant 13 (Written): The only obstacle I had was getting logged in but [the instructor] helped me with that immediately.

9. How would you compare the process of working face-to-face versus with a Wiki? What were the principal differences? What were the advantages and disadvantages of each approach? Which did you prefer, and why?

Participant 2 (Written): The process of working face-to-face went much better than the online group. Seeing each group member on a bi-weekly basis helped us keep each other accountable to our work and help each other out if someone came across a snag better than the online group.
Participant 4 (Written): The principle differences included immediate communication and collaboration and group structure. The advantages of working face-to-face was that it was possible to get immediate input and conversation allowed us to quicker refine our focus. The advantages of working through the WIKI were the experience of communicating through a new medium and enhancing our technical expertise. The biggest disadvantage to both was that whenever you are working with new people it is important to dedicate time to getting to know one another’s strengths and weaknesses. I preferred working face-to-face because it was an easy and efficient way to express each persons individual input and therefore arrive at a much more viable product.

Participant 5 (Written): I preferred working face-to-face because I felt like there was more community as well as more of an opportunity to discuss ideas and topics. I feel if people would have contributed more to the Wiki it also would have provided good discussion and community.

Participant 6 (Written): Face to face is easier to work with than on Wiki. The main differences were the communication processes were easier face to face. The only disadvantage of online was the time we had to wait for e-mail responses. I preferred face to face because we had that personal contact and could discuss problems we were each encountering.

Participant 7 (Written): Face-to-Face was easier because the people were there and you could communicate easily your ideas. WIKI was nice because of the convenience of being able to access it from wherever, but it seemed a lot harder to get the
people to use the WIKI. If it was something we were using from the start of the semester on a daily/weekly basis, I think it would have been more successful, but I think some people were intimidated by it. I liked the WIKI and the use of it.

Participant 8 (Written): I preferred working face-to-face rather than on the Wiki. The principal differences were that when you use the Wiki you lose the personal aspect of working directly with someone which I think may affect your dedication to the project. An advantage of the Wiki, however, is that you don’t have to worry about scheduling a meeting time with the group. Again, the disadvantage is that you lose the personal aspect and I think it also makes it a little more difficult to communicate with other another because you have to wait until the others check their e-mails or log onto the Wiki in order to get a response. Therefore, the advantages of meeting face-to-face are that you can better communicate. A disadvantage to working face-to-face would be that you would have to work around everyone’s schedules so that you could meet.

Participant 13 (Written): It provides so much information along with easy access with interaction. Obviously the principle differences were that we didn’t speak to one another through the norm (phone, in person etc.,) rather we could only speak to one another online. The only disadvantage was that sometimes it was a little hard to get a hold of some people from time to time. Advantages for both were that it’s great to work in groups. You get to really meet and learn about each other rather than a regular class in which the only thing you know about your fellow classmate is whatever they have to say on the first day.
10. Is there anything else you would like to add?

Participant 1 (Oral): I’m going to stick with my whole; it seems to me that putting things together face-to-face seems to work out better personally as far as my opinion. I’m not sure things went so well because [one student] really spearheaded the face-to-face collaboration and so he really just got there, got things put together and so things flowed together really well. But I’m pretty sure that when people would be together face-to-face that would happen. I’m pretty sure someone would step up and a situation face-to-face and do it; but when you’re online, someone stepping up just isn’t as easy and so no one really stepped, well, yeah, and so on I think putting things together would work better, like production would work better on face-to-face or at least preproduction; but then definitely in postproduction, Wiki’s the best. Actually once you have things, just putting them together into one document the Wiki would be best. It seems like a nice balance of the two would be pretty ideal.

Participant 2 (Written): I would rather have had at least a few more assignments, preferably separate form the group, in which to balance out my grade so to speak. It is difficult to judge accuracy when other people have such an influence on your grade no matter how good the rest of the team was. I could have worked the hardest or not done any work at all and I could still get a passing grade, which to me seem unfair especially if I got a good grade for not working at all.

Participant 3 (Oral): I think that one thing was that we found, we worked in the first group, our group that we had the had the advantage, I think, of first working
without the Wiki, and the reason it’s kind of an advantage is that when you’re
working together, it’s easier to form a game plan when you’re just right in front of
each other, it’s easier to just, OK, what do we have to do to form a game plan, and
the advantage that we had is that we just used that same game plan once we went
electronically; it kind of was like let’s just do the same thing as last time; whereas
I can see if we had to do the Wiki first, the other way around, I think we would
have eventually come to the same logical conclusion of just dividing up the work
electronically, but because we had done that beforehand it was just everybody
was just I’ll take this, I’ll take this, I’ll take this, I’ll take this, done, and you just
made sure that yours wasn’t taken. It was very easy.

Participant 4 (Written): [No response]

Participant 5 (Written): [No response]

Participant 6 (Written): This class was very informative and I liked it a lot. In the future, I
think Wiki would be an excellent way to teach and get students involved in group
activities but first they need to know that each person needs to put the same
amount of time into each project.

Participant 7 (Written): Both worked well, but I feel that the WIKI could be a great tool.

Participant 8 (Written): [No response]

Participant 9 (Oral): I think the advantage that Wiki has it is for like a long distance sort
of collaboration, where you know you can’t meet face-to-face even if you would
have liked to; people transcontinental, you have to balance time schedules and
stuff so even with something like Skype [an Internet-based telephone service] or
even Instant Messenger it still makes it difficult. So I imagine that would probably be its greatest strength. And I think, too, it helps really to have, or at least within a business environment or within the class, it helps to have a very strong idea of where it’s supposed to go and someone who’s willing to help be a leader in the project, to lead other people and point them in that direction, because as a group just trying to move as one just doesn’t happen. You need someone who’s getting people on their toes.

Participant 13 (Written): Stick with WIKI it was really cool and interesting. Stick with the format you used, splitting us up into 2 groups and doing the opposite. Overall cool class.

Following the interviews, a group of four participants discussed with the researcher an aspect of their Wiki experience they hadn’t mentioned in their interview responses. The exchange provides additional information about their Wiki work:

Participant 9: I think the Wiki was the most effective because we actually had someone who spearheaded it at the beginning. My experience with the Wiki was pretty similar in that we had someone who was sort of spearheading it but wasn’t going to take charge. If you had someone, I guess, who was making sure people were accountable, in my own experience I think it would make it a lot more effective because you have someone being there saying “we need you to do this,” and people being more comfortable with each other’s work. Because I’d look at
people’s and I would say part of it is just editing grammar and stuff that needs to be changed, but I didn’t do it. So I don’t know. It’s just more comfortable.

**Researcher: Why didn’t you do it?**

Participant 9: I don’t know. I think probably it was because we had assigned an editor, someone to be an editor, so that I kind of said “Oh you know he’ll take care of that for us.” But again part of it’s laziness because you know when you assign someone a section and say “OK, you cover the future of television,” then if someone else is doing their section and you think that you should add something, you’ve already done your part so you’re kind hesitant, do I really need to do this work for someone else? But I guess for the overall good of the project you probably should. So I don’t know.

**Researcher [addressing the other discussion participants]: Following that same stream a bit, did any of you edit or want to edit other people’s comments on the Wiki as a participant? Now if you had the role of editor that would be different.**

Participant 1: The only thing I actually ended up editing was someone sent me an e-mail of their stuff and I took their stuff and I integrated it into my material, because we were both doing DVRs, past, present and future. And since someone else e-mailed me their information on DVR and I edited it and put it into mine and I compiled it into one broad scope. But I actually didn’t end up editing people’s work on the final one. The problem with [the other student’s] edit was people being assigned their work and probably ignoring it.

Participant 11: I didn’t edit anybody’s work on the Wiki.
Participant 1: Yes, because the rough draft actually ended up not being a Wiki thing; it ended up being everyone’s e-mail to a person who e-mailed because I put out an e-mail to the group saying, “hey we got to get this stuff put together,” and so everyone ended up, well, people did do it. I can’t remember exactly who did it, but I remember pretty surely everyone e-mailed me that information and then I just put the information together as the rough draft. So I think I did a lot more on the rough draft, but then I didn’t do as much work on the final.

Participant 3: He did pretty much all the rough draft and getting it put together was all him and stuff, and then there was some stuff that I was supposed to post that I didn’t post. And I posted that after the rough draft for the final. It’s kind of like extra on demand stuff. And for me it was information that I was supposed to post for the rough draft but I forgot to post. It was me and [two other students in the group]. So I just kind of added on to it later on.

Participant 1: Yeah. So it made the final copy a lot better, but the rough draft was pretty rough but it worked, it worked as a rough draft.

Researcher: Please address your willingness to edit other people’s work on the Wiki.

Participant 1: Yeah. It wouldn’t seem to bother me if I would edit someone’s grammatical mistakes, like if it was spelled wrong. I don’t they would have a problem editing that. But if we were all students, it almost seems, not that I wouldn’t do it, but it almost seems like a little insulting or bizarre editing another student’s work considering he’s a student as well. It’s not like if I was a teacher; of course I would go onto the web site and edit it. Well if I was a superior,
someone was higher up like a boss, that’s a better analogy. You could go over and talk among students, say “hey you can edit whatever I do, I can edit whatever you do as long as it’s for the betterment of the project.” We didn’t talk about that.

Participant 3: Or one thing even could have been if one person is assigned to just basically, the last the day before it’s due, go out there and read through the entire thing, make any changes, grammatical or whatever’s necessary. That could easily be a whole job by itself inside a group.
APPENDIX E

GROUP REPORTS
Group Reports
Assignment 1: Radio—Group 1

Radio Report

The following looks intently at the three main aspects of modern radio. It looks at terrestrial Radio, where it is at and where it is going, and the 2 new aspects and technology of Satellite radio and Pod casting.

Terrestrial Radio seems to now be in trouble, most articles written on the subject of terrestrial radio today, concentrate on the fact that terrestrial radio has much competition now. With satellite radio coming out with less commercials, and even no commercials on some channels, and pod casting with it’s ability to give access to programs on the demand of the listener, it is a tough market for terrestrial to compete in. Many initiatives have and are being taken to save terrestrial radio.

WOXY-FM was launched in Cincinnati, Ohio in 1983, and was the 6th modern rock station format in the United States. But after 21 years of being broadcasted the radio station is now only offered online. The radio station started broadcasting online in 1998, and in the years that followed that most of the growth of the station was in the online area. Eventually the owners decided to sell the broadcast license and equipment, but kept the intellectual property of 97x or Woxy.com. They kept the logo, trademark, DJ’s, the music library and everything else that made the station what it is. The only thing lost was the local frequency, so anyone who still wants to listen can simply go online to do so.
This is obviously an option for radio stations looking to cut costs and keep their local market. Since almost every home has a computer, it can still be listened to by anyone at home, and since most offices have computers too. It can still be listened to there. It is also only a matter of time before cars are equip with access to the Internet as well.

95X WAQX-FM in Syracuse is now going to start syndicating the Opie and Anthony Show on their stations in the mourning, this is a show that was previous to this only offered on XM satellite radio. This is a strange move of playing satellite content on terrestrial radio. This is risky for terrestrial radio though being that it will ultimately give 4 hours of satellite radio advertising on terrestrial.

These may be the next moves for terrestrial radio due to the fact that new formats such as the “Jack” format, that cuts costs by getting rid of DJ’s, is not working out as well as hoped for terrestrial radio. Clear channel is keeping the same radio format, but running shorter commercials, and are taking what they call “temporary revenue hit.” Either way these options are not working out well for terrestrial radio.

The competition for terrestrial radio is coming heavy from their satellite competition. This is not just in the fight for listeners, but very heavily now in the fight for advertising. Terrestrial radio relies a lot on local advertising, an advantage they have over satellite radio, which is more concerned on a national level. In many major cities however
satellite radio is putting up repeaters, the same ground technology used by local stations. This puts the satellite companies one step away from doing more local programming, and also getting local advertising. They are basically just an FCC ruling away. (http://www.avrev.com/news/0604/30.satellite.html) A bill is being introduced to congress however that will help to hold satellite radio to its original charter as a national service. Rep Chip Pickering, R., Miss., introduced the House version of the bill in March 2005. It now has 110 cosponsors. The bill would prevent satellite radio from inserting any kind of “locally differentiated” content on their ground based repeaters. (http://billboardradiomonitor.com/radiomonitor/news/business/leg_reg/article_display.jsp?vnu_content_id=1002197720). This would help the problems that terrestrial radio is now facing.

The idea of satellite radio first began in 1992 when the FCC allocated a spectrum in the “S” band for nationwide broadcasting of satellite-based Digital Audio Radio Service. (http://electronics.howstuffworks.com/satellite-radio2.htm) Two licenses were given to CD Radio (Sirius Satellite Radio) and American Mobile Radio. (XM Satellite Radio) (http://electronics.howstuffworks.com/satellite-radio2.htm) The less known of satellite radio companies is WorldSpace. WorldSpace is actually the leader in the industry. The plan of WorldSpace is to broadcast to the entire world rather than one country. WorldSpace reports that it has the potential to reach an audience of 4.6 billion people. (http://electronics.howstuffworks.com/satellite-radio4.htm)

There are quite a few reasons people believe satellite radio to be better than FM. One positive is that no matter what area you are in satellite radio has about every kind of
music imaginable. Reception in satellite radio will never fade in and out. The content is unedited due to the lack of FCC regulations on satellite broadcasts and because of that they offer parental control to block stations with explicit language. On the music channels of satellite radio there are no commercials so there are never any interruptions.

(http://4wheeldrive.about.com/od/autoparts4x4accesories/a/satelliteradio_5.htm)

On the other hand there are quite a few people who believe that FM still reigns supreme over satellite radio. First, you have to have a special radio to listen in. Start-up costs are expensive. XM hardware will not work with Sirius products. There is the possibility of dropouts when driving through tunnels and near tall buildings. Finally there are still commercials on news and sports talk shows.

(http://4wheeldrive.about.com/od/autoparts4x4accesories/a/satelliteradio_3.htm)

Satellite radio is also looking toward the future. Both companies already have deals with major car manufactures and are now looking into a deal to implement the idea of satellite radio combined with podcasting.


For the time being both companies offer over 125 channels including over 30 channels of news, sports, talk and entertainment. There are about two million titles for playlists and many satellite stations are broadcast over the internet. If you obtain satellite radio you still have access to everything you had before you got satellite including AM, FM, cassette and CD.
Both satellite radio providers are charging around $13 a month for service. People believe that satellite radio has been a long time coming and that it is a great idea. People also believe that the price needs to go down or the option of MP3 and podcasts will dominate the up and coming audio market. Satellite radio will not be able to dominate the marketplace unless they have the ability to adjust and improve with their coming success.

Podcasting was developed from the idea of downloading music or MP3 files from the internet then transferring that data onto a portable MP3 player and then, finally, playing them. The original appeal was to allow individuals to “distribute” there own “radio shows” but has evolved into much more. It has become, especially now with the implementation of video being cast, it’s own medium. Podcasting is spreading into every avenue of life. News organizations can distribute audio and video in addition to their text news products. In schools, homework revisions are being podcasted; politics, religion, law enforcement, sports are all being podcasted.

(http://www.podcastblaster.com/podcasting-the-future.html)

Anyone can podcast virtually anything they want. There are no regulations on podcasting. Directors can podcast their commentary from their shows, politicians can talk platform issues, and you can listen whenever you want to whatever you want.

Here in lies some of the negative aspects. With access to anything that you very well could see or hear something that offends you such as pornography, gore, obscenities, and so on.

The outlook on podcasting is that it will only get larger. This medium will eventually produce a huge advertising market. You can download movies and then hook
up your iPod to your television. You can access any video/audio ever created and downloadable to your iPod. Apple-history.com::ipod(withvideo)
Assignment 1: Radio—Group 2

“Radio in the New Millennium”

The following is a compendium of radio relevant information. This report is intended to be a blueprint and educational tool used for Communications Teachers, Students, Professionals and Investors. This report is broken down into six sections each treating a different aspect of the radio medium. From definitions, to history to effect projection and so on.

History of Radio

In order to understand radio and project where it is going it is essential that we appreciate the history of radio and comprehend its past. In the late 1800’s the door to electromagnetism was opened, which is the foundation of broadcasting. In 1892 Guglielmo Marconi discovers the originator of radio by transmitting electromagnetic waves.

In 1901 Marconi sends Morse code from England to Canada and then proceeds to patent a “selective tuning device for receivers.” The Radio Act of 1912 goes into effect assigning codes to radio stations and limiting the broadcasting wavelength to 360m, which then jams the signals. At this point radio is beginning to become a household name and between 1914-1918 radio is used to aid the efforts of World War I.
In 1920 the first commercial radio broadcast is transmitted from Pittsburgh, PA at KDKA. Within a few years there are hundreds of stations entertaining thousands of people. This starts with people listening to home made crystal sets with headphones eventually it progresses to a large battery-operated set with dials and a horn speaker, then moving into a piece of furniture with only one knob and loudspeakers. At the end of the 1920’s the Radio Act of 1927 is passed which “re-assigns stations to clearer frequencies, and for the first time makes radio stations operate in the public interest, convenience, and necessity.”

Between the 1930’s and 1940’s radio begins to mature and becomes a big business. During the depression people begin to depend upon the radio to uplift them. President Roosevelt used the radio to build Americans confidence thus becoming known for his “fireside chats.” In 1934 the FCC, Federal Communications Commission, is formed during the Communications Act of 1934. The FCC replaces the FRC and regulates radio. Also in the 1930’s Edwin Armstrong introduces FM, frequency modulation, which is a static free method of radio transmission.

With the introduction of television and it becoming a household commodity, radio struggles in the 1950’s. In the 1960’s radio begins to reinvent with the AM top 40 and continues to hold onto the ratings into the early 1970’s. In the 1970’s radio begins to make a lot of money with advertisers wanting to buy radio because of the plentiful listeners and music stations. Radio also begins to format and target market their stations
during this time “now there are soft hits, old rock, new rock, classic rock, disco, young soul, old soul, Latino, etc.”

In the 1980’s radio struggles and stations become worth less than one originally paid for them, leading to almost half of the radio stations changing ownership. By 1990 almost ninety-nine percent of households in the U.S. have at least one radio with the average household owning five. In 1993 the FCC allows for more stations by expanding the AM radio band. Digital begins to take over radio technology not only in production but also in delivery. The Internet for example becomes a delivery service. Also in the 90’s many AM stations are revived by talk radio.

Types of Radio

As discussed earlier, radio has been around since the early 1900s, but over the past several years, radio has been changing rapidly. Although developed by Guglielmo Marconi in Bologna, Italy in December 1894, the radio did not see its Golden Age until 1935 when President Franklin Roosevelt used the radio for his fireside chats during the great depression.

Radio and it’s many facets concerns many distinct variations of one electronic mediums. A lot of the terminology therefore can become complex and confusing. Therefore this section will deal with various definitions concerning radio and broadcast.
AM stands for Amplitude Modulation, which means that the waves that are sent out from the tower, the frequency remains constant, but the amplitude is adjusted allowing the signal to reach far distances, but producing a poorer quality signal. FM stands for Frequency Modulation, which means that the amplitude remains constant, but the frequency is adjusted allowing for a better quality sound, but not as far of a reach.

Satellite radio is a new form of radio, which actually started in 1992 when the FCC allowed for the S band at 2.3GHZ. Four companies competed for a license, but Sirius and XM won the two licenses in 1997 and paid close to $80 million for the rights to broadcast on the S Band. Sirius launched in 2002, while XM launched in 2001.

Internet radio consists of shows being available either on-demand through podcasts or downloads, or shows being streamed live via Internet radio stations. All of these mediums, in one way or another have changed and continue to influence mass media today.
Present radio and the effects of other mediums

There is a great deal of the structure and use of radio that separates it from other mediums. Radio is a medium who’s scope of influence and innovation place it in a league of it’s own.

For instance, radio is still free… Amazing. However, just as with what happened with cable television, now satellite radio is shifting things following a very similar path. On modern radio they try to be really interactive with their listeners. For example “give us a call!” “Check us out online!” “Enter our contest!” are all enticements that you might get from a typical radio station.

Additionally the medium of radio has branched out in its affectivity with the invention of the satellite. Satellite radio or subscription radio (SR) is a digital radio that receives signals broadcast by communications satellite, which covers a much wider geographical range than terrestrial radio signals.

SR functions anyplace there is line of sight between the antenna and the satellite, given there are no major obstructions, such as tunnels or buildings. SR audiences can follow a single channel regardless of location within a given range. Because the technology requires access to a commercial satellite for signal propagation, SR services are
commercial business entities (not private parties), which offer a package of channels as part of their service and requiring a subscription from end users to access its channels.

Currently, the main SR providers are Worldspace in Europe, Asia and Africa, and XM Radio and Sirius in North America. All are proprietary and non-compatible signals, requiring proprietary hardware for decoding and playback. These and other services have news, weather, sports, and several music channels.

Finally, with the dawn of podcasts as well, it doesn’t have to be appointment radio, you can order the podcast for any show and have available on your PC or MP3 player for whenever you are able to listen. The more convenient things are, the more people that can use them! With the rise of new and more frequently used mediums of mass communication, some may view radio as the dinosaur of the mass media.

There are many interactions however that radio still has with other mediums both positive and negative, that continue to have an effect on the world of mass communication. Some examples are:

1. Radio doesn’t match up to the audience of Television or the amount of hours most viewers put in.
2. Radio still has good ground and is in fact, gaining ground with its ability to adapt and utilize new technologies.

3. The internet has helped the radio, giving shows a place to be seen online and airing their live shows all over the world in a way that is most accessible to listeners.

4. Just as print slowly became the least impressive form of media so too in ways is radio, but it still has kept its functionality and usefulness.
Assignment 2: Television—Group 1

Television

The idea of television goes all the way back to the late 1800’s. In 1885 the first electromechanical television, which used a spinning disk, was patented by Paul Nipkow of Germany. A.A. Campbell-Swinton and Boris Rosing developed the cathode ray tube in 1907 to lead the way to electronic television. According to http://en.wikipedia.org/wiki/History_of_television.html the first live, long distance broadcast was done by Bell Labs in 1927 through a wire link from Washington to New York starring Herbert Hoover. John Baird of Scotland “…broadcast the first transatlantic television signal, between London and New York…” in 1928 (Wikipedia).


Color programming was spreading and so was production of color television sets. According to http://www.fcc.gov/omd/history/tv/1960-1989.html “By 1967, most network programming was in color. And, by 1972 half of U.S. households had color television” (FCC). On July 10, 1961, NASA launched a satellite called TELSTAR through the atmosphere from the Kennedy Space Center allowing television signals to be received throughout the world. Through this technology the live broadcast of the historic boxing match between Muhammad Ali and Joe Frazier known as the “Thrilla from Manila” was transmitted which “most experts agree...clearly demonstrated the ability of satellite communications to show real-time images from around the world…and forever changed the cable industry...” (FCC).

Home Box Office (HBO) was the first station to initiate satellite broadcasts when they aired their “thriller from Manila” in 1976. At the same time a former National Aeronautics and Space Administration (NASA) scientist and Stanford University Professor, Emeritus Howard, constructed a big dish-shaped antenna that could pick up cable channels for free. When he sent HBO a check for $100 to pay for the free programming he had received they sent his check back to him saying that they only did business at company level and refused to work on an individual basis. Therefore, Mr. Howard published a how-to book on the system he had constructed and co-founded a Chaparral Communications Inc. that produced parts for the system. The company became a multimillion-dollar business within six years.
In 1977, Christian Broadcasting Network, The Family Channel and Turner Broadcasting System began broadcasting their cable services via satellite. In the early 1980s, hardware for satellites fell and consumers flocked to the idea of Direct Broadcast Satellite (DBS), which made it possible to receive 100 channels for only an initial price of around 3 thousand dollars. In fact, not only was the cost 35% lower than cable, the picture and sound quality of the satellite broadcasts were significantly better.

In 1984, cable providers cried to the government. The government listened. The 1984 Cable Act allowed cable providers to encrypt their satellite feeds. In fact, free satellite TV was outlawed. There satellite sales dropped significantly and it did not reemerge as a competitor to cable in the TV marketplace until 1992.

In 1992, four large-scale DBS companies made it possible for an individual consumer to enjoy 150-200 channels with a smaller, more practical, satellite dish at a reasonable price. Since then, the satellite industry was become the fastest growing consumer electronics of all time. (thehistoryof.net)

The world of television has just recently been turned on it’s head by the idea of the Digital Video Recorder or DVR. The DVR is a device that actually lets one back up and pause live TV without the use of a VCR. It can be custom-programmed to record one’s favorite shows whenever they air. It is a search engine tool to track down and automatically record the programs that meet one’s interests (by title, actor, director, category, even keyword). With a DVR, one can get information on programs through the system. The world of DVR’s started In August 1997 when Teleworld, Inc. was founded by Michael Ramsay and James Barton. Only later did the corporation Teleworld became what we now know today as TiVo. On September 30th, 1999 TiVo went public with 5,500,000 shares at $16 apiece. The first big blow to TiVo came on April 23rd, 2002 with an interview in Cableworld, Jamie Kellner (chairman and CEO of Turner Broadcasting) said that PVRs like TiVo are bad “Because of the ad skips.... It’s theft. Your contract with the network when you get the show is you’re going to watch the spots. Otherwise you couldn’t get the show on an ad-supported basis. Any time you skip a commercial or watch the button you’re actually stealing the programming.” (rotten.com)

TiVo has grown by leaps and bounds but has also faced some fierce competition from cable companies such as Comcast who offer a DVR with competive prices and more convenient services for Comcast subscribers. Some say that the future is not looking to good for TiVo. “With Cable and Satellite companies providing their own DVRs to consumers in record numbers, TiVo users continue to drop.” (dvr.about.com) The only way TiVo will be able to stay alive in this fast growing business is to produce something superior to its competition. Ultimately only time can tell if TiVo will stay alive, if cable or satellite driven DVR will take control, or if a new better product will spring out of this new and fertile market in world of Television.
Today’s Satellite TV offers consumers music stations, over 250 channels, DVR, HD TV, sports and special interest packages, some local channels, parental controls, and interactive TV. The cost, amount of channels, and benefits a consumer typically receives differ in a variety of packages and satellite companies. A typical satellite customer pays $40-$80 dollars a month and enjoys around 100-125 TV channels and around 30-70 music channels.

The music channels come in a wide variety 24 hours a day with little or no advertising. Regular TV channels are broadcast 24 hours a day with pay channel options. Satellite customers can purchase movies, “advertising free” channels like HBO, and sometimes enjoy things like being able to enjoy things like, “exclusive on-demand partnerships, and only our customers can view FX series before they air.” (Direct-TV)

More recently satellite TV has been offering sport packages, HD TV, DVR, and an interactive channel. The sport packages allow a customer to see all or almost all the sporting events broadcast on television for his or her favorite professional sport. HD TV allows viewers to enjoy better quality picture and full function use of an HD TV at home if they have one. Satellite companies boast that DVR for satellites has more features than for cable. They also can be used to search satellite programming for movies, TV shows, and any programming with specific actors. To look at an interactive channel it is easiest to let Dish Network describes their own, “… View the top-6 news, entertainment and sport networks simultaneously on one channel or select any window to watch full screen. Plus check the latest in news, weather and entertainment, view your investment portfolio, play games, sing karaoke, and pay your DISH Network bill all in one place.”

Satellite TV is coming out with new features every few months. At the rate technology and satellite TV are currently merging it looks like it will become more than just regular TV. A wireless company, EION, and leading satellite company, Telesat, are currently in a $2.5 million project to develop pure on-demand satellite TV. This would allow more interactivity between the television and satellite. With the interactive channel customers are now able to pay their bill through their TV. It is very possible that satellite TV could become more interactive and allow users to surf the internet, pay other bills, have interactive TV shows, and much more. It all depends on what the consumer demand is and where the industry creativity.

The history of television is said to have started between 1872 and 1877 when a series of photographs were viewed via stroboscopic disc. In 1884, George Eastman invented a flexible photographic film that would aid in the future inventions for television. Thomas Edison was the first to patent a motion picture camera in 1887, though there are speculations to whether he deserved credit for it, and in 1888 he attempted to record picture photos onto a wax cylinder. Later in 1891 Dickson shot numerous 15 second motion pictures using the kineograph, which was the motion picture camera Edison patented in 1887. A public demonstration of these motion pictures were shown in France in 1895 which included a short called the Gay Brothers which is still debated today among film audiences. The Cathode Ray Tube was developed in 1897 by Ferdinand Braun and this invention went on to later help in the production of television images in
1907. The iconoscope was patented in 1923 which was the forerunner of the picture tube and talking films hit the screen with the first ever being Jazz Singer in 1927 (History of Film and Television).

Television came about from the hard work of multiple inventors. The first generation of television sets were a far cry from what we enjoy today. Back before 1935, the set was made up of a display consisting of a small motor with a spinning disc and a neon lamp, which produced a blurry reddish-orange picture about half the size of a business card. This was during the era known as “Mechanical Television” and is nothing like the technology for the fully-electronic televisions of today (Television History).

Bell telephone labs and AT&T started giving public demonstrations over wire and radio circuits to produce early make-shift televisions. The pictures were sent by wire via Washington DC to New York City and a wireless demonstration was also done from Whipppany, New Jersey to New York City as well. Secretary of commerce at the time Herbert Hoover, gave a speech transmitted at 18 frames per second, which were received on a 2”x3” screen and it was said that the pictures sent by wire and radio were equivalent in quality (Television History).

The following article is from the front page of a New York newspaper dated April 8, 1927, “The combined telephone and television instruments were set in cabinets shrouded from outer light by heavy maroon curtains, cabinets reminiscent of those in which the stage magician places the lady who is mysteriously to disappear” (The Troy Record) (Television History).

In the early 1930s black and white broadcasting experiments were done by the company RCA, which held its first public demonstration of a new TV camera in 1945, offering a sharper image than those then in use. The first television broadcast was made available in London in 1936 and two years later in 1938 a man named George Valensi made an initial proposal for color television broadcasts (History of Film and Television).

In 1945 there were fewer than 7,000 working television sets in the United States alone and only nine stations on the air. Over 25,000 people showed up over three weeks for the chance to see NBC programs at the first ever large scale television demonstration in Philadelphia (History of Film and Television).

In 1946, the “Blue Network” which was part of NBC became the network ABC, after the FCC ruled that RCA had to divest itself of one of its two networks. NBC’s Blue was sold in 1943 for $8 million dollars to Edward Noble and became ABC in 1945. Later that year, the heavyweight fight at Yankee Stadium boasted a success of an audience of 150,000 people watching 5,000 television sets. Many of these people watching were watching television for the first time (History of Film and Television).
In 1947, the premiere of *Kraft Television Theatre*, which was the television equivalent of the live Broadway stage, became an instant hit. The FCC postponed final decisions on color television standards but later reversed the ruling. *Meet the Press*, which aired on NBC that year, would go on to become the oldest series on network television (History of Film and Television).

1948 saw the rise in television set sales of 515% since 1947 which issued in the affirmation that television was the new accepted media and by the fall of 1948, the FCC issued 108 licenses for new stations with hundreds more soon to come. Cable television systems, which were originally known as Community Antenna Television, were born in remote areas of Oregon and Pennsylvania. This basically brought television signals to communities where off-air reception wouldn’t reach because of one reason or other. January 1949, the number of television stations hits a record 98 stations. The FCC develops the “Fairness Doctrine,” which made broadcasters liable for researching and representing all sides of the story when controversial, which followed the communications act of 1934 which required stations to give candidates equal air time (History of Film and Television).

The first color program was aired CBS on June 21, 1951 but only 25 receivers could accommodate mechanical color so 12 million viewers saw nothing but a blank screen. The National Association of Radio and Television Broadcasters set down guidelines for content of broadcasts and advertising in 1952, and after complaints, a subcommittee investigated offensive and immoral television programs which most of the complaints came from ads on beer commercials and soap opera dramas. By the end of the year, 20 million television sets are in American homes nationwide and a record $288 million was spent on advertising alone (History of Film and Television).

Ampex Corporation introduces videotape for the first time in 1956; prior to this time most shows were still being produced using kinescope process and by 1958, 61 stations had started using videotape instead of the kinescope. A medical condition known as “television legs,” blood clots as a result from sitting too long, is identified by a report in the *Journal of the American Medical Association* in 1957. By the end of 1957, television expenditures reach $2 billion (History of Film and Television).

September 26, 1960 began a new era with the broadcast of debates between candidates John F. Kennedy and Richard Nixon which aired across the country. 1963 aired a commercial featuring an African American boy on a Wisk commercial. In November of that year, JFK is shot and coverage of the assassination and funeral are aired worldwide for days (History of Film and Television).

In 1968, the NAB Code Authority buckles down on violence in television after Martin Luther King Jr. and US Senator Robert F. Kennedy are assassinated. The next year Neil Armstrong’s first step on the moon is broadcast and watched by millions of US viewers
live. That same year the Supreme Court has the “Fairness Doctrine” applied to cigarettes in allowing equal time to air anti-smoking commercials and later still the FCC tries to ban cigarette ads altogether on radio and television alike. In 1971 the repercussion of this action caused the broadcast business about $220 million in advertising. 1974 began the campaign to limit ads marketing to children, which allowed 10 minutes hourly (History of Film and Television).

The Children’s Television Act took effect in 1990, which limited the commercialization in children’s programming and required operators have at least some programming that met the educational and informational needs of children (History of Film and Television).

The DVD comes on to the scene in 2000 and Sony introduces the CDCam allowing people to record directly onto CD from a camcorder. The MicroMV Digital MPEG-2 is introduced in 2002, offering high resolution to palm sized recorders. DVDs finally out sell VHS tapes in 2004 and in 2005 flat screen television and HDTV take front and center while high definition broadcast is supposed to be the new medium by the end of 2006 (History of Film and Television).

Currently in the TV industry there is no such thing that exists as live TV Internet that is bandwidth efficient Therefore there is no equivalent to broadcast TV over the Internet. Because of this there is no way that broadcast TV is going to die anytime soon. The Internet could never give the same thing that broadcast TV can provide for the simple reason that the Internet can’t broadcast. The Internet can give individual unicast streams but that’s is all, nothing else. When something is broad casted over the Internet there is not one video stream that everyone tunes into. In contrast everyone has to have there own video stream. This is a lot of bandwidth and can get to be expensive. Because of this too it is tough to judge how much bandwidth you need, because you can never judge how many people are gonna watch a show. If you broad casted over the Internet and you only have the bandwidth for 10 million users, and 20 million want to watch it, then you have a problem. And always having more bandwidth then needed can get to be expensive. (http://www.blogmaverick.com/entry/1234000443053436/)

Broadcast TV is reaching out to, and is finding markets where they did not exist before. NBC is starting soon to broadcast 3 minutes of news, weather and sports at gas pumps. The short program would starts as soon as you take the pump out of the cradle it’s on. (http://www.lostremote.com/archives/cat_broadcast_tv.html)

These changes go along with the fact that Rupert Murdoch is warning the media industry to adapt to new technology or go basically extinct very quickly. He predicts that media will become like fast food, with people watching the news, sports and film clips on the run from things like mobile phones. (http://www.lostremote.com/archives/cat_broadcast_tv.html)
Today’s Satellite TV offers consumers music stations, over 250 channels, DVR (Digital Video Recorder), HD TV, sports and special interest packages, some local channels, parental controls, and interactive TV. The cost, amount of channels, and benefits a consumer typically receives differ in a variety of packages and satellite companies. A typical satellite costumer pays $40-$80 dollars a month and enjoys around 100-125 TV channels and around 30-70 music channels.

The music channels come in a wide variety 24 hours a day with little or no advertising. Regular TV channels are broadcast 24 hours a day with pay channel options. Satellite costumers can purchase movies, “advertising free” channels like HBO, and sometimes enjoy things like being able to enjoy things like, “exclusive on-demand partnerships, and only our customers can view FX series before they air.” (Direct-TV)

More recently satellite TV has been offering sport packages, HD TV, DVR, and an interactive channel. The sport packages allow a costumer to see all or almost all the sporting events broadcast on television for his or her favorite professional sport. HD TV allows viewers to enjoy better quality picture and full function use of an HD TV at home if they have one. DVRs record around 100 hours and allow users to record, fast-forward and rewind pre-recorded TV, and more. They also can be used to search satellite programming for movies, TV shows, and any programming with specific actors. To look at an interactive channel it is easiest to let Dish Network describes their own, “… View the top-6 news, entertainment and sport networks simultaneously on one channel or select any window to watch full screen. Plus check the latest in news, weather and entertainment, view your investment portfolio, play games, sing karaoke, and pay your DISH Network bill all in one place.”

Satellite TV is coming out with new features every few months. At the rate technology and satellite TV are currently merging it looks like it will become more than just regular TV. A wireless company, EION, and leading satellite company, Telesat, are currently in a $2.5 million project to develop pure on-demand satellite TV. This would allow more interactivity between the television and satellite. With the interactive channel costumers are now able to pay their bill through their TV. It is very possible that satellite TV could become more interactive and allow users to surf the internet, pay other bills, have interactive TV shows, and much more. It all depends on what the consumer demand is and where the industry creativity.

Sources


Assignment 2: Television—Group 2

Television has evolved over the years into one of the necessities many people need. Who invented the television? Many inventors from around the world are credited with the way television has come into existence; France, America, and Scotland are a few of the countries involved. The “Mechanical Television Era” begins before 1935 and includes the invention of the television screen combined with a neon lamp, which produced a reddish image.

One of the most famous inventors that needs to be mentioned is Philo T. Farnsworth. In 1926 during this era, Philo started with experimentations regarding electronic television. To many people, Philo is called the “unknown father of television” because of the many inventors that claimed they came up with the idea of the television. For example, David Sarnoff who was employed by RCA built one of the first television stations in the 1930. At this time only selected few had sets because of how expensive they were. Also around this time Franklin Roosevelt was the first president to appear on television. Philo was a genius in his early years and got the idea of television while working on a potato field. With 6,000 dollars in his pockets and friends to help him, Philo put his plan into effect of making the first television. He brought the idea to RCA where Zworykin and his company had been trying to complete an identical project and this caused a court case where both companies sued each other but in the end Philo won. Zworykin was another main contributor for the development of television. For one, Vladimir came all the way from Russia to the United States to follow his dreams of making the first television. Zworykin’s main achievement during this time was the
Iconoscope in 1923 and he had also developed the kinescope, which is most of the reason why he has been called the father of television.

In 1936, the summer Olympics in Berlin were televised using Philo’s equipment and in the following year the Coronation of King George VI were shown on televisions in England. In 1940 standards were met and black and white picture would be available. Because of World War 11, television’s progress was put on hold until after the war because the technology was needed in the war. In 1945 when the war ended, many companies thought that radio would be enough but because of the demand from the buyers businesses started to tape everything they could get their hands on. In 1946, Viewtone’s television was offered to the public for one hundred dollars and in the same year RCA put out their ten-inch screen that was sold for three hundred dollars.

In 1950 the first color television, which uses the mechanical color wheel was put on the market and also in that same year the FCC approves CBS for commercial broadcasting and in 1954 RCA has a colored screen television on market.

One of the earlier problems television found was with so many stations where would they go? The FCC did not know where to put all the stations so they froze these stations until they could figure out what to do; and in 1952 the stations went on air. Four main radio stations were brought to television, CBS, ABC, NBC, and DuMont. Seeing that still today three of those four networks are still in existence, DuMont’s station lived a short life, but while it was on air, the programs it carried were mostly quiz-shows and sport shows. The Golden Age of television is between 1948 to 1958. During this era
dramatic programs began evolving and taking over the stations and because of the excellent quality stations used.

Sources:

www.tvhandbook.com

www.tvhistory.com

Within the US broadcasting spectrum there are many television stations. However, most stations in the United States are owned by a broadcast corporation. A broadcast corporation is a larger company that, in addition to its own self-titled station, owns other smaller stations. Broadcast corporations are either public or commercial.

Public broadcast corporations do not exist to make profit. Designed to educate the public, public corporations receive their funding from government grants and private donations. In the United States all of the public channels are affiliates of the Public Broadcast Corporation (PBS). With 349 affiliate stations PBS is also the largest corporation in the United States.¹

Commercial broadcast corporations are privately owned. They function as a business, and as such, rely on advertising for their profits. In the United States there are 20 different commercial corporations. Of these twenty the four largest are ABC, NBC, CBS and FOX. Each of these corporations owns a singular channel carrying its name in addition to other over-the-air stations. For example, CBS owns MTV.² As such, CBS

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¹ www.pbs.org

² http://www.turnoffyourtv.com/networks/revenueupdate04/revenue.html
shares in the profits made by MTV. Because of this, the broadcast corporation also has a say in what is to be aired on such stations. These stations are not to be confused with affiliate stations. Affiliates are not owned by a broadcast corporation. They daily air content provided by the network, such as a nightly newscast, but do not split their profits with the broadcast corporation. Affiliate stations also exercise more control of their station than a station owned by a corporation.

The Nielsen rating system has become an integral part of commercial corporations. Through surveys and ‘set meters’, a computer that records an individuals television habits, the Nielsen ratings gives an estimate of how many viewers are watching a particular channel compared to all of the televisions in America. Commercial corporations rely on these ratings to garner advertisers, the source of their funding. A high rating guarantees an advertiser a larger audience.

In this mediatropolis we call the mass communication market there are so many forms of reaching consumer and public. An entire section of these mediums can be categorized as visual mediums. Visual mediums specifically mean television, film, and broadband or Internet video. All three of these mediums are in constant competition with one another for viewer attention although each medium provides entirely different forms of entertainment and information. Additionally each does target completely different demographic groups but tend to blur the lines of marketing science. It is therefore important to look at the ways in which these three mediums in particular compete and cooperate to further communicate with their respective audience and to better the social communication of humanity.
Television is a market unto itself, producing news, sports, sitcoms, dramas, movies, reality shows, etc. This medium proves to be the most diversified of all three. However there is a new phenomenon to be observed in Internet media. It appears that the web is greatly competing with television as it can offer virtually everything that television can with a lack of commercials and a more selective means of targeting its audience. What this means is that the average viewer can choose exactly what they wish to watch at any given time of day. This gap too is closing however with the introduction of On Demand television.

The demographic margins of these two mediums are at some places indistinguishable and therefore tend compete aggressively. For instance Internet users watch less television - 4.8 hours on average a week in the USA as compared to those without Internet access. And long time users of the Internet watch 5.8 hours less according to Leslie Walker of Semantic Web. However there are also times when TV and the Internet work together nicely. For instance most any major television network is on the web. During television broadcasts they advertise for Internet entertainment and are now offering content on their websites. Conversely the Internet commands a heavy market of television show and made-for-TV movie advertisements to up viewer support.

On the other side of the viewer market is the movie watcher. This consumer can be enticed by any of the three mediums at any given time. Whereas it is most common to view movies and documentaries etc at the theatre or on a television, it is becoming increasingly popular to download and purchase movies online. The film industry, which
concentrates primarily on movie making, is now branching out into the platform of reality and documentary formats.

These informative forms of visual media are crossing the lines of the television and Internet news arenas and popping up in theatres everywhere. Additionally there is a different atmosphere that films offer with differing production techniques and viewing environments that give the film industry a unique hold on consumer attention. Again you can see film ads everywhere on the Internet and television programming. Moreover, Internet and television producers are turning to the movie preview screen for additional interest.

Finally the new comer to the stage, Internet or broadband video welcomes a new means to access entertainment and news. With the emergence of video blogs, web movie sites and now Google video, the viewer is able to view what they want when they want. The set backs to this are innumerable but still offer enough advantages to stay afloat. With a lack of content restriction it can be cumbersome for a viewer to find what they want with out finding a lot of what they don’t want. Also it is apparent with current technologies, although getting increasingly better, the quality of streaming and downloaded visual media is just not as good as that of television or film.

The cooperation of television and film with the Internet is the most popular of all of the forms of cooperation between the mediums. The integration of the Internet into film corporations’ and television networks’ business models is incredible. It is rare these days to find a major motion picture or even a television show for that matter, which
doesn’t also have a dedicated website which is advertised on the broadband video sites and everywhere else.

All three mediums of television, film, and Internet video remain separate and competing forces in the world of communication. These mediums have always and will always battle over viewership and consumer attention. However the convergence and cooperation of these mediums is equally popular to the success of each. Although separate and distinct from one another each of these mediums cooperate and compete, making up the market and industry of visual communication.

Although the responsibility of virtuous and ethical television and film rest equally on audiences as well as programmers often times the audience forgets the importance of being a critical viewer. For example the television can be running all day and most people will not understand much about or even enjoy what they are doing. A new kind of illiteracy is breaking through, one that is more subtle but yet sends “more messages than all printed material combined” (Primeau, 1979, p. 8). Rarely do viewers take into account how the media is persuading them.

Because today’s audience often doesn’t consider how they are being persuaded by the media they fail to develop their own judgment. A critical viewer would take into account that television and films are not only intended to entertain but to sell products and to communicate feelings and values. Throughout history, rhetoricians studied the techniques people use to persuade others. There are five parts of classical rhetoric, invention, arrangement, elocution, pronunciation, and memoria, all of which can be used to analyze the way something is communicated to us.
Invention which is interchangeable with discovering looks at how speakers created or discovered material. Questions that viewers should ask when evaluating the invention of a show or film include; “Where do you suppose the creators of the program got the material for this show? Is the material believable? Is it original? Fresh? Too much like other programs of its kind?” (Primeau, 1979, p. 22). Invention techniques are different for television and film because they “are almost always intended to discover what will sell” (Primeau, p. 26).

Arrangement deals with the structure, organization and form. Most arrangements include six parts that create a detectable pattern that viewers learn to recognize easily. First the subject is introduced to attract attention, curiosity, and set up the audience for what is to come. Second is narration which lists the facts or essentials to be discussed. Third is division which puts “the material into workable parts” (Primeau, p. 26). Fourth is confirmation which is “a presentation of proof” (Primeau, p. 26). Fifth is refutation where the opposing arguments are disposed of. Sixth is the conclusion which provides a summary (Primeau).

Style is the ingredient of personal flair, because it is a way that can be identified with the personality of a speaker or actor (Primeau). Style is something that “shows itself in every moment in the way a person walks, talks, dresses, or decorates a home, office, or car” (Primeau, p. 27).

Delivery is the actual and physical speaking of the actor or speaker (Primeau). Delivery is concerned with pauses in a message or how someone looks into the camera. Although many things shape how messages are delivered such as technology it is
considered one of “the most crucial processes in the rhetoric of television” (Primeau, p. 29).

Memoria is making something memorable to the audience. One can simply ask the question of how and why certain messages are not forgotten (Primeau). Whether it is through slogans, trademarks, or the repetition of certain words messages are easily absorbed and retained. Therefore they become easily noticeable to viewers.

Television and film do have psychological, sociological, and emotional effects on audiences this is something that is not going to dissipate. With audiences aware of the art of persuasion and rhetoric one can better understand the messages they are receiving (Primeau).


The future of TV is looking different with each passing moment. Recently, MythTV is an attempt to create the ultimate set-top box software, and lets users turn a PC into a powerful personal video recorder. The project was started in 2002 by developer Isaac Richards. It’s free and open-source, and a community has developed around the project. “I got tired of the rather low quality cable box that AT&T Broadband provides with their digital cable service,” notes Richards. “It’s slow to change channels, ridden with ads, and the program guide is a joke. So, I figured it’d be fun to try and build a replacement.”

After several years of development, MythTV has a broad range of features:

- Basic ‘live-tv’ functionality. Pause/Fast Forward/Rewind “live” TV.
- Support for multiple tuner cards and multiple simultaneous recordings.
- Distributed architecture allowing multiple recording machines and multiple playback machines on the same network, completely transparent to the user.

- Compresses video in software using rtjpeg (from Nuppelvideo) or mpeg4 (from libavcodec). Full support for Hardware MPEG-2 encoder cards (Hauppauge PVR-250 / PVR-350). Preliminary support for DVB cards and the new pcHDTV tuner card.

- Support for the (very nice looking) hardware MPEG-2 decoder and TV out present on the Hauppauge PVR-350.

- Completely automatic commercial detection/skipping

- Grabs program information using xmltv.

- A fully themeable menu to tie it all together.

For years and years we’ve been hearing about how interactive television is “the next big thing” - and each of those predictions has gone nowhere. For just about every test of interactive TV in some location, there’s a story of how it failed. However, people are still predicting that interactive television is coming and this time they have a stronger argument. With things like TiVo, interactive TV is showing up in homes without anyone realizing that it’s interactive TV. The article linked above looks at a number of different directions interactive TV might go in, and what sort of business models may come out of it. They don’t think much of “t-commerce” models where you can buy the jacket someone’s wearing during a TV show, but do think that the nature of TV advertising will need to change.
REFERENCES


Lefrere, P. (1997). Teaching in hyperspace, learning.teaching.interacting@hyperspace/
The Potential of the Web Workshop. College Park, MD: International University
Consortium and the University of Maryland System Institute for Distance
Education.

Boston: Addison-Wesley.

Students’ perceptions of process and outcomes. British Journal of Educational
Psychology, 75(3), 373-390.

Goodsell, M. R. Maher, V. Tinto, B. L. Smith, & J. MacGregor (Eds.),
Collaborative learning: A sourcebook for higher education (pp. 37-40).
University Park, PA: National Center on Postsecondary Teaching, Learning, and
Assessment.


from


Skiba, D. J. (2005). Do your students wiki? *Nursing Education Perspectives, 26*(2), 121-122.


