

Distance Education for Technical Writing

Literature Review

Matthias Jonas
UW-Milwaukee
December 19, 2001

Contents

I.	Introduction	1
	A. Definition	1
	B. Scope of distance education	2
	C. Method of research	2
II.	Core Elements	3
	A. Instructors	3
	B. Students	4
	C. Technological support	5
	D. Administration	7
III.	Course Design	7
	A. Pedagogy of online education	7
	B. Learning Community	8
	C. Course development	9
	1. Steps of development	9
	2. Study guide	10
	3. Course content	11
	D. Online interaction	12

IV.	Technology	14
	A. Technology issues	14
	B. Technology selection	15
	C. Technology tools	16
	1. Asynchronous interactive technology	16
	2. Synchronous interactive technology	18
V.	Technical Writing	20
VI.	Research Findings	21
VII.	Conclusion	23
VIII.	Works Cited	25
	Annotated Bibliography	28

I. Introduction

A. Definition

Distance education is an alternative way to offer education for learners who cannot or do not want to attend on-campus classes. At distance education teaching and learning occur independently from time and place. Moore and Kearsley define distance education as “planned learning that normally occurs in a different place from teaching and as a result requires special techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements” (2). If distance education occurs via the Internet or the World Wide Web, many authors use the term online education or online learning (Kearsley 2000, Hanna et al., Palloff and Pratt, Swan et al.).

According to Schwitzer et al. the term online or distance learning emphasizes the learner-centered approach in teaching and facilitating learning among students at a distance (12-13). Some authors use the term distance learning to stress the fact that learners learn in places and times that are more convenient for them than for the instructors or the institutions. However, Moore and Kearsley state that distance learning does not sufficiently respect that teaching instructions are also crucial for the learning success of the learners. They prefer using the term distance education because it includes both deliberate and planned teaching, and successful learning independent from place and time (2).

In the following literature review I use the term online education when I am speaking about computer mediated distance education such as the delivery via the Internet or the World Wide Web. The terms distance education or distance learning refer to general aspects independent from the method of course delivery.

B. Scope of Distance Education

Distance education emerged with the first correspondence study in Sweden in 1883. In the 1950s and 1960s broadcast or teleconferencing was added as a further delivery method. Since the beginning of the 1990s interactive Web-based instruction or computer networks have dominated distance education delivery (Schneider and Clark 38f.; Moore and Kearsley 36-58).

The fastest development of online education occurred at Colleges and Universities. These institutions have already had the necessary infrastructure such as hardware, software, and technical support when online education became increasingly popular. Online education takes place on several different levels such as networks, higher education, K-12 schools, corporations and government agencies, nonprofit organizations, the home, and public spaces (Kearsley 14-18).

For the purpose of this literature review I focus on computer mediated distance education (online education) at the university level.

C. Method and Scope of Research

Before I started working on my literature review I did not know much about distance education and how online education is used in the field of technical writing. To learn more about distance education in general I started my research with interviewing two professors at UWM who teach online courses. They explained me the broad concept of online education, how online courses are delivered, and how to develop online courses. They also gave me a bibliography about distance education which served as starting point for my literature research.

Distance or online education is very popular at the time. Literature covers this topic quite well in terms of quantity. Theories are developing, and many instructors report about their

experience with teaching online courses (as hybrid or distance education courses only). For this literature review I mainly focus on periodicals and books. I did not want to rely on Web pages for sources since I discovered that many Web pages to which authors referred in their publication had already disappeared.

Literature about online education has been developed since the late 1980s or beginning 1990s. Due to the fast technological development many publications are already dated. To provide the latest possible information about distance and online education for technical writing, I use mainly literature published in the second half of the 1990s and later. I also try to focus on computer mediated distance education (or online education) only. However, many basic concepts of distance education also apply to online education. This literature review and the annotated bibliography cover both literature about general concepts of distance education and literature about specific demands for online education.

II. Core Elements

David Leonard identifies the following four core elements that are essential for a successful distance learning program: instructor, students, technological support, and administration. These core elements identify different roles and responsibilities which are essential in planning, developing and executing online courses.

A. Instructors

Moore and Kearsley emphasize that online teaching differs immensely from face-to-face interaction. Instructors take full advantage of the media and lecture less. They bring learners

continuously into action by asking questions, encouraging student presentations, having students discuss, and involve completely in the teaching - learning process.

In an online teaching environment the role of the instructor is manifold. Leonhard calls the online instructor facilitator, coach, mentor, and leader (392). Kearsley (152f) concludes that the instructor's role in an online course changes from presenter to facilitator or mentor to promote student interaction and participation.

Online education requires a certain level of motivation and self-discipline from both instructors and students. Instructors can make learners aware of the motivation and self-discipline an online course requires by

1. Giving a quiz at the beginning to assess learners' readiness for online learning
2. Discussing instructors' requirements at the beginning of the class
3. Asking students to develop a schedule or learning contact with the teacher to plan course activities (Hanna et al. 17).

To promote a sense of participation in the course with students, instructors should always give feedback to students' contributions and handed in assignments. Students need to have a chance to ask questions or state their views about the topics discussed in class. Regular feedback shows that the instructor pays attention to the students and helps to build an online classroom community (Moore and Kearsley, Farrell).

B. Students

Kearsley claims that online education should be student-centered. He further explains that online learning is a challenge on several levels. Teachers create and organize a class, define the goals and facilitate the learning process. However, students largely determine the direction of the class

through their participation and activities. Students discover the content on their own and must show self-responsibility for their learning because in an online learning course students decide when, where and how to learn. Online students further own a greater autonomy than students in a traditional on-campus class. With this increased freedom students have to show responsibility, self-discipline as well as motivation to complete assignments in time. They further have to possess good learning skills and good computer skills (Kearsley 5f, 62f).

Hanna et al. assess that students have to be self-motivated and self-directed. Online learning demands learner responsibility because learners have to organize their time effectively, include readings and online discussions in their regular schedules, and meet assignment deadlines to follow up with the ongoing discussion and workload (Hanna et al. 17). These challenges are also the reason why online courses are attractive for adult learners. Schneider and Clark state that interactive online courses provide a very good learning environment for adult students because they less see the teacher as only knowledge deliverer and take more responsibility for their learning process (43f).

Schwitzer et al. summarize the differences between distance education students and traditional college students. Distance education students

- are usually older
- are often women
- are diverse in ethnicity
- are more advanced cognitively
- possess different learning background
- have multiple responsibilities
- pursue a determined career goal

- have substantial personal and workplace experience (Schwitzer 63-85)

C. Technological support

Developing an online course or even online program requires time and money. Instructors have to learn the challenges of online teaching and become familiar with the technology. Students need to fulfill the technological requirements for attending an online course and further need to learn how to deal with the technology used in the course. To enroll in an online distance course learners need at least a computer, a modem, an Internet service provider, an email address, and a word processing software. An online course or program uses a mix of online teaching and learning applications. On the market are several software tools which support instructors to create and manage online courses such as BlackBoard, Web CT, Learning Space. (Kearsley, 41-3). Many instructors develop their own Web site using CGI programs and Perl scripts. Both methods are time consuming and purchasing software tools requires financial investments.

Technology is the backbone of a successful online education endeavor. Because students use the online learning environment 24 hours a day on 7 days a week, a successful online course has to guarantee reliable technology. Students need to be able to contact a technical support service whenever they experience technological difficulties. Therefore, a 24-hour technological support hotline is crucial for any online education program (Hanna et al., Kearsley, Leonard, Mabrito).

D. Administration

Distance and online education has become very popular. However, successful implementation of an online program also depends on the commitment of the university administration. According to Leonard the administration must provide all the necessary resources to implement an online distance education program. Since distance education programs offered via the Internet are still at the beginning stages administration must consider experimentation and failure as an important learning process in the evolution of the online program. To keep the rate of failures at a minimum level the administration is responsible “to provide the resources and [to] create an organizational environment in which all participants work toward the common goal of discovery [online] learning” (Leonard, 395).

III. Course Design

A. Pedagogy of online education

Lawrence Clark states that online courses “should not only help students to learn the course content, but also encourage students to develop skills and strategies to help themselves learn in the future” (Clark 20). However, Tebeaux concludes that distance instruction requires instructors to sacrifice pedagogical goals that are considered sacred. Distance education requires that “the concept of ‘teaming’ and development of interpersonal skills through peer review is lost” (Tebeaux 388). Due to the rapid technological changes the development of a sound theory of teaching technical writing in an online environment is almost impossible. Scholars have to neglect the theory and start testing what is available (Tebeaux 388-90).

Kearsley sees the engagement theory as a helpful learning model for online education.

Engagement theory requires learners “actively engaged in meaningful tasks for effective learning to occur. This means learners should be designing, planning, problem solving, evaluating, making decisions, or involved in discussions “ (Kearsley 67). The three important features of the engagement theory comprise collaboration, problem-based activities, and authentic content. Taking engagement theory as a basis, instructors have their students first get to know each other through personal introduction postings via email or discussion forums. Students should then work in groups on specific tasks (Kearsley 67-69).

B. Online learning environment

The Web environment offers several approaches for teaching and learning. It provides the platform for formal and informal education, and synchronous and asynchronous learning. Participating in an online course requires good time management skills. Instructors and students have to participate in the class at least every other day to keep up with the online discussion postings (Hanna et al., xvii, 18).

Schneider and Clark describe five characteristics of a learning environment that support adult students the best way (Schneider and Clark 43f.):

1. Reciprocity
2. Experienced-based learning
3. Personal application
4. Individualized and self-directed experience
5. Integrated learning and living environment

Reciprocity describes that learning includes both giving and receiving. Experience-based learning explains that experience tells adult learners what they need to learn and also contribute

to the learning of others. Learning stresses personal application, and technology enables students to solve individual and specific problems. Individualized and self-directed experience shows that students depend less on listening to a lecture. Students rather gather material themselves and decide what is important and what not. Finally, learning is independent from the classroom but integrated in home and the workplace.

Social environments where students can talk about things not related to the course are also important to overcome the distance and non-personal contact of an online class. Students should have an informal (online) environment to “establish personal knowledge of each other’s interests and goals for the class and beyond” (Hanna et al. 55).

C. Course development

1. Steps of development

Because instructors and students do not meet on a face-to-face bases, they do not have the opportunity to talk things over and clarify unclear instructions. Therefore, online teaching needs thorough planning. Moore and Kearsley propose that before instructors start designing a distance education course they should first decide on content, sequence and organization of context, media, teaching strategies, learning measurement, feedback to students, and method to create materials. The authors further suggest dividing the courses into units. They mention the following advantages:

- Units help students to incorporate their studies in the normal life style.
- Short segments help students to organize the content and make it easier to learn and remember.
- Short segments help students to overview and assess their learning progress.

- Short segments help to integrate the new material into existing cognitive structures that makes learning easier (Moore and Kearsley 109).

Kearsley suggests a slight different approach for developing an online course. According to him instructors should develop their first online course by transferring an already existing on-campus course. Developing an online course requires five steps: At first, instructors should determine student assignments and exercises. This will define the level of interactivity and participation. In the second step instructors have to decide the extent of group work. They determine activities students have to perform in groups and alone. All assignments can also be done in group work only, however, with changing group members. After deciding on activities and the ways of student participation, the next step requires the development of the course documents: syllabus, lesson plan, and study guide. In the fourth step instructors have to rethink their propensity to lecture. They need to decide how much they want to lecture, for example with Power point presentation, voice streaming, real-time conferencing. The instructors' roles in an online course change from presenter to facilitator or moderator to promote student interaction and participation.

When the framework is set up (5th step) a test group should identify problems. This should be done before much energy is spent on the design and development of the final course. Pilot testing is a valuable aspect of quality control measures. Ideally, a small group also tests the whole course before the actual class starts (Kearsley 151-3).

2. Study guide

A study guide or course syllabus for distance education courses provides a framework for other course materials and is “intended to communicate teaching” (Moore and Kearsley 108). Moore and Kearsley suggest the following content of the study guide:

- Introduction
- Assignments and directions for work
- Annotated bibliography
- Grading scheme
- Self-testing questions
- Course schedule
- Information how to contact the instructor (Moore and Kearsley 107-8).

Because the study guide substitutes given instructions and discussions in class and the present teacher, it should be written in a conversational rather than formal language style or scholarly type. A goal should be to present a conversational atmosphere in the study guide that should also reflect the general tone of the learning environment.

Farrell stresses that the study guide of an online course should include course guidelines, course descriptions, information about the instructor including how to contact him/ her, learning objectives, course expectations, instructor and institutional policies, and schedule of assignments.

3. Course content

Because online education differs from face-to-face classroom education, Kearsley claims that online instructors use new forms of teaching and learning. Instructors can assure course quality if they develop content that is relevant for students. Course materials and activities should be clear and easy to use (usability). The workload should be appropriate for type and course level.

Furthermore, content elements should guarantee collaboration, interactivity among the students and instructor, authenticity, and online as well as offline assistance for trouble shooting (Kearsley 4-12, 105).

Kearsley emphasizes that good online courses have to follow usability and aesthetic principles. Usability means that the course content and technology tools are easy to use. Aesthetics of screen plays refers to the way information is presented and organized (96-8).

Farrell suggests developing content that uses a good media mix. Course material can be delivered additionally through audio files, video files, and links to Web pages. To keep the online course interesting instructors should avoid boring Power point presentation and standard outlines of course materials. The delivery should be stimulating and informative to keep the students interested in the course.

D. Online interaction

The most successful distance learning methods offer a high level of interactivity among students and between students and instructors. Instructor-learner interaction is widely seen a crucial factor in student satisfaction and success (Schwitzer et al. 15). The online learning environment provides teachers with multiple interactive strategies. Online interactions can be synchronous (discussing course content in real time) and asynchronous. In asynchronous activities learners participate at times convenient to them (Hanna et al. xvii).

Swan et al. discover three factors which contribute to the success of online courses:

- Transparent interface and consistent course design
- Intensive interaction of the instructor with the students
- Dynamic discussions

These factors are mainly embedded in an asynchronous online learning environment. The goal of online interaction is to build an online community (517-8).

Mabrito (82-5) states that online courses must consist of continuing interaction among instructors and students. He defines four types of online interactivity: navigational, functional, adaptive, and collaborative. Navigation refers to clicking on hyperlinks in order to get on to the next page. Navigation is the most basic form of interactivity. Functional interactivity comprises features where user and computer work together to achieve a goal, such as playing a game or buying a book. Adaptive interactivity can be explained by the use of various scripts. They allow students to exchange research results and drafts in progress. Students can also make changes on the Web. Exchange of drafts is also possible through email attachment. This involves less immediate interaction than via scripts. The highest level of interactivity is collaboration which enables student and instructor to “work together to create new knowledge in ways that would not otherwise be possible” (Mabrito 82).

Kearsley claims that many students lack experience with collaborative or group work. Therefore, instructors have to provide procedures how students work effectively in an online team environment (Kearsley 152). However, Swan et al. discovered in a study that students’ satisfaction with distance education courses declines with the increasing demand to participate in group or cooperative work. Students thought that they learned less from collaborative work.

Instructors have to ensure that student participate regularly in the online activities. Therefore, instructors have to design learning activities that are relevant and realistic. Instructors must provide many input and feedback to students and make participation a course requirement and part of the grade. Instructors should also post regular messages themselves to show that they are present online (Kearsley 78-80). In addition to weekly participation on discussion board Farrell suggests that students complete weekly assignments, take quizzes every two to three weeks and submit a final project every fourth week.

IV. Technology

A. Technology issues

Technology helps to overcome distance, and it enables learning to take place on different places, at different times. However, if technology is used ineffectively it will present “a powerful deterrent for learning” (Hanna et al. xviii). In online learning technology requires much attention from both teachers and learners. Therefore, technology needs to “be addressed continuously and incorporated creatively by both the learner and the teacher...” (Hanna et al. xviii).

Because online courses base on a complex technology, knowing how to handle or keeping the technology working demands thorough planning, organizational skills and in depth knowledge of the technology (incl. software) involved. Failure of technology or the lack of knowledge how to operate certain features can lead to a powerful de-motivator for learning. To avoid technological frustration, instructors should plan the usage of technology carefully and show a very in-depth understanding of it. A help desk should be available 24 hours per day on seven days a week. Additionally, instructors should provide learners with detailed instruction what to do if technology does not work and develop a backup emergency plan when the whole delivery system collapses (Hanna et al. 26).

To assess learners’ computer literacy and technology knowledge, instructors should interview prospective learners or send out a questionnaire. Learners in an online class have different levels of expertise in technology and the differences can provide both challenges and opportunities. Learners face additional workload to learn more about the technology and need additional time to develop these skills. Therefore, instructors should match a technologically

advanced student with a less technical student as technology buddies. This is also a helpful method to overcome anonymity in an online class.

Some people do not feel comfortable to deal with so much technology that an online course can require. This fear of technology can interfere with students' overall education and satisfaction. Even though these students will probably not consider taking an online course, many of them who do, finally will end up with learning the most in and from online courses (Hanna et al.).

Clark concludes that too much technology can impede online learning. He concludes that keeping the technology simple helps students to concentrate on the content (Clark 20).

B. Technology selection

Different technology and media can support communication in distance education such as print media (newspapers, newsletters), audio- and videocassettes, radio and television, teleconferencing, and computers (Moore and Kearsley 78-100). Further traditional ways to interact are Fax machines, telephones, and U.S. postal service.

However, the selection of different media tools in distance education program should depend on the content and therefore be rather content-driven than technology-driven. The selection of technology should base on the learning objectives, learners' involvement, learning environment, the specific content, and the pedagogical purposes. The selection of the media tool further depends on the message the instructor wants to communicate to the learners, whether the instructor wants to raise students' motivation, recall earlier learning, provide new learning stimuli, activate student responses, give quick feedback to the student, or encourage appropriate practice (Moore and Kearsley, 69f, 96).

However, Moore and Kearsley caution that the successful use for a media tool does not solely depend on the media features but depends on how instructors use this tool, and how they understand the technology behind it. Successful use further depends on the quality of the overall course design, lesson's design and the quality of interaction the instructor is capable of (98).

Incorporating several different media in a distance education course services several purposes. Different media address different learning needs of the students, allow differences in student learning styles or capabilities, and provide redundancy and flexibility. Different media also meet a wider range of students and offer backups. If one medium fails, another one can compensate the failure.

C. Technology tools

Technology tools can be selected according to the mode of interaction desired: synchronous (real-time) or asynchronous.

1. Asynchronous interactive technology

Email and threaded discussion

Email is the most popular way to exchange information asynchronously. Students and instructors can send document to each other by attaching the files to an email. The email technology can also be used for email listserv discussions. Instructors create an email list of the students that has an extra email address. If students or the instructor want to post a message, they write an email to this email list and every course participant receives the message.

Threaded discussions are also called asynchronous conferencing, a forum, or a bulletin board. The principle working mechanism is: participants create topics and subtopics in a public

Web environment (at least for the class public), and participants post messages under any topic or subtopic they want to. Elements of a posted message in a threaded discussion are the sender's name, a subject title, and the text of the message. To read the posting, participants click on the message of the desired topic or subtopic. A reply function (usually) enables readers to answer immediately to this topic/ subtopic. The threaded discussion can be open for the whole class or be divided in groups of students. Certain threaded discussion systems also allow participants to post messages anonymously.

The advantage to email discussion is that all the messages remain on the system and are shown in one window interface. All the messages and senders as well as the development of the discussion are easily to track. A problem of threaded discussion is the order of messages. The discussion system quickly obtains hundred messages, posted under different subtopics. Participants often do not pay attention to post their messages on the right topic or subtopic level which creates confusion into the discussion sequence.

To avoid chaos on discussion boards instructors have to monitor the threaded discussion, to give clear instructions how and where to post messages, keep the discussion organized, and remove wrongly posted messages to the right topic/ subtopic level (Kearsley 30f).

File transfer systems and software applications

File transfer systems allow students and instructors to exchange files, post files on a server, and download files from a server. Using a file transfer system requires that participants have the same software applications to open and work with the files. Students have to know how to work with all the software applications required for the course. Otherwise, the online course will be less successful for them. (Kearsley 37-9)

The advantage of asynchronous communication is that students can post a message or respond at a time of their convenience. They do not have the pressure to make an appointment with other students or the instructor and to go online at a certain time. The disadvantage lies in the lack of intimacy which may intimidate students to participate on asynchronous interactivity.

2. Synchronous communication

Online chat

Real-time conferencing is most commonly known as chat sessions where participants exchange typed messages which everyone can see as soon as they are typed. Each message starts with the name of the sender so that identification is possible. Chat sessions are real-time events and very spontaneous and dynamic. If more than three or four participants participate, the discussion can be difficult to follow as multiple conversations occur at the same time. In such cases a moderator should control the discussion and tell people when they can speak. The moderator keeps the discussion focused, organized, and assures that everybody participates.

Real-time conferencing can be used for a topic related discussion initiated by the instructor or any other facilitator. Students can use chats for projects or just to socialize without the instructor. Most chat sessions can be saved as a file so that the discussion can be reviewed later (Kearsley 31-2).

MUDs and MOOs

MUDs (multi-user domains) and MOOs (MUDs object-oriented) are also real-time conference settings. Participants share a virtual world which is set up as 'rooms' where they can post chat messages and objects (Kearsley 32-33).

Desktop video

Desktop videos are like a chat system using video images instead of text messages. To develop desktop video conferences, instructors need an inexpensive digital camera and software. People can connect to the network and listen to the video, submit questions, and participate in a discussion. All these can occur synchronously.

To have a successful desktop video conference, instructors should keep the group small (up to five or six participants). If instructors want to use synchronous desktop video, they should consider connection speed (modem, bandwidth, LAN) and hardware equipment. Low connection and improper hardware equipment can have a negative effect (Kearsley 33-34).

Audiographic systems

Audiographic systems allow real-time exchange of audios, graphic images or applications.

Participants can listen to voices and look at images simultaneously. Most common are Power point presentations that are commented by the instructor. MS Netmeeting is a audiographics system which offers audio- or videoconferencing, shared applications, whiteboard, chat, and file transfer (Kearsley 34f).

Groupware programs

Groupware programs facilitate group interaction. MUD/MOO systems are specific groupware programs. A popular groupware program is Lotus Notes (asynchronous and synchronous usage is possible). Groupware programs focus on problem solving and decision-making tasks. They include activities such as brainstorming, poll taking, prioritization, and negotiation (Kearsley 35-37).

Real-time applications offer several advantages. They offer more open and fluent communication than asynchronous interaction. Users can share applications/ project products during sessions. A split screen format allows the students to look at and edit the draft during the session. The disadvantages of real-time applications are that students have to make an appointment and the discussion can become informal (MacLeod 89).

V. Technical Writing

Teaching technical writing is a complex process and comprises the writing process, document drafting, revising and editing, evaluation, and layout and design (Alred et al.). How can these features be taught in an online education courses? Research and literature still have to address this question more thoroughly. The challenges of writing classes which are taught online include editing and revising papers using proofreaders' marks, peer editing and student collaboration, and teaching, conducting, and guiding the writing process.

Teaching writing classes online is less content dump but more interaction and collaboration among learners and between learner and instructor. Teaching technical writing classes online as full distance education classes suffers from a specific technical shortcoming. Industry has not delivered yet software that enables teachers to teach writing as a process, including proofreading and revising as effective as in on-campus classes.

Literature about writing courses taught online is available and helpful to learn more about the issues and challenges. However, authors do seldom talk in detail how they revise, discuss, and return the papers to students. How do they edit and correct the papers technically? Do they use word processors, or do they print papers and correct them off-screen? What software do they use?

Foreman is the only author who addresses closely these questions. He uses CommonSpace software which enables the instructor to revise and edit essays on the screen by using a linked column feature. The student's text appears in the left column. The instructor highlights the area in the left column and writes his notes in the right column. When the student clicks on the remarks the area is highlighted in the left column. In contrast with the track changes feature of Microsoft Word the original document does become overwhelmed with editing remarks.

There still needs to be published findings about how to teach writing collaboration, peer editing online; what technique should be used; and how to proceed.

VI. Research Findings

Research on distance education has shown that there is no significant difference in learning achievements between distance education and face-to-face classes. The achievements were measured according to grades, test scores, retention, and job performance. Moore and Kearsley (61-5) conclude that

- there is no proof that classroom teaching is the best method of instruction
- providing teaching instruction over distance can be as effective as classroom instructions
- the absence of personal face-to-face contact does not harm the learning process
- the success of a course depends on its design, delivery, and how it is conducted
- it does not matter whether the course is taught face-to-face or at a distance

Kearsley confirms these findings and cites studies at University/ College level. According to these findings students learn in online courses at least as well as in on-campus courses and

show higher levels of involvement and commitment in online courses. Most students seem to like online courses and are more satisfied with online courses (Kearsley 45-50).

Schneider and Clark (41 ff.) describe demographic features at CU-Denver and MSCD. They explain that distance education students are older than on-campus students. More white Caucasian students enroll in distance education courses than other ethnicity members. More female students enroll in distance education courses than represented on the Internet as a whole. Distance education seems no barrier for women.

Swan et al. present interesting findings from a survey about students' satisfaction with distance education courses at the State University of New York (SUNY) Learningnetwork. They discovered three important factors for successful distance education courses. However, they also show the failure of collaborative learning in an online environment. According to Swan et al. students' satisfaction with distance education courses declines with the increasing demand to participate in group or cooperative work. Reasons might lie in the asynchronous structure of the course, the difficulty to motivate students for online group work, and instructors' naivete (sic) about collaborative work.

Although it is difficult to state how many online education courses universities or colleges offer, and what format they use (emails, discussion groups online, hybrid, complete online setting), Greg Kearsley sees a clear trend that more collage courses will be offered only online without any on-campus component.

VII. Conclusion

In this literature review I discussed important issues dealing with both distance education in general and online education specifically. I tried to discover how technical writing is taught in an online environment and how instructors can still employ the writing process, peer editing and revising with proofreaders' marks. Even though literature is abundant about distance and online education, instructors of technical writing classes still need to develop their own concept how to teach writing classes online successfully.

The following sources are quite helpful for instructors to learn more about online education:

Kearsley, Greg. Online Education: Learning and Teaching in Cyberspace. Belmont, CA: Wadsworth, 2000.

Hanna, Donald E., Michelle Glowacki-Dudka, and Simone Conceição-Runlee. 147 Practical Tips for Teaching Online Groups: Essentials of Web-Based Education. Madison, WI: Atwood, 2000.

Foreman, Joel. "The All Digital Distance Writing Course." THE Journal 26 (1998): 76-78. 31 Oct. 2001 Corporate Resource Net database: Corporate Resource Net.

Leonard, David C. "Using the Web for Graduate Courses in Technical Communication with Distant Learners." Technical Communication 43 (1996): 388-401.

Swan Karen, Peter Shea, Eric E. Fredericksen, Alexandra M. Pickett, and William E. Pelz.

“Course Design Factors Influencing the Success of Online Learning.” EDRS database. WebNet 2000 World conference on the WWW and Internet Proceedings. 30 Oct.– 04 Nov. 2000: San Antonio, TX, 512-18.

Tebeaux, Elizabeth. “Technical Writing by Distance: Refocusing the Pedagogy of Technical Communication.” Technical Communication Quarterly 4 (1995): 365-93.

The following three sources are less helpful to learn more about online education:

Lockwood, Fred, and Anne Gooley, ed. Innovation in Open & Distance Learning: Successful Development of Online and Web-Based Learning. London: Kogan Page, 2001.

Gillette, David. “Pedagogy, Architecture, and the Virtual Classroom.” Technical Communication Quarterly 8 (1999): 21-36.

Mabrito, Mark. “Facilitating Interactivity in an Online Business Writing Center.” Business Communication Quarterly 64 (2001): 81-86.

VIII. Works Cited

Alred, Gerald J., Walter E. Oliu, and Charles T. Brusaw. The Professional Writer: A Guide for Advanced Technical Writing. New York: St. Martin's Press, 1992.

Clark, Lawrence J. "Web-based Teaching: A New Educational Paradigm." Intercom 48 (2001): 20-21.

Farrell, Barbara. "Developing a Successful Online Class: What Works to Keep the Students Motivated and Interested?" Education at a Distance 15 (2001). 5 Nov. 2001
<http://www.usdla.org/ED_magazine/illuminactive/MAY01_Issue/article08.html>.

Foreman, Joel. "The All Digital Distance Writing Course." THE Journal 26 (1998): 76-78. 31 Oct. 2001 Corporate Resource Net database: Corporate Resource Net.

Gillette, David. „Pedagogy, Architecture, and the Virtual Classroom.“ Technical Communication Quarterly 8 (1999): 21-36.

Hanna, Donald E., Michelle Glowacki-Dudka, and Simone Conceição-Runlee. 147 Practical Tips for Teaching Online Groups: Essentials of Web-Based Education. Madison, WI: Atwood, 2000.

Kearsley, Greg. Online Education: Learning and Teaching in Cyberspace. Belmont, CA: Wadsworth, 2000.

Leonard, David C. "Using the Web for Graduate Courses in Technical Communication with Distant Learners." Technical Communication 43 (1996): 388-401.

Lockwood, Fred, and Anne Gooley, ed. Innovation in Open & Distance Learning: Successful Development of Online and Web-Based Learning. London: Kogan Page, 2001.

Mabrito, Mark. "Facilitating Interactivity in an Online Business Writing Center." Business Communication Quarterly 64 (2001): 81-86.

MacLeod, Laura. "Computer-Aided Peer Review of Writing." Business Communication Quarterly 62 (1999): 87-94.

Moore, Michael G., and Greg Kearsley. Distance Education: A Systems View. Belmont: Wadsworth, 1996.

Sawyer, Paul R. "Evaluating the Design and Delivery of an Online Technical Writing Course." Diss. Illinois State University, 1997.

Schneider, Suzanne P., and Clark G. Germann. „Technical Communication on the Web: A Profile of Learners and Learning Environments." Technical Communication Quarterly 8 (1999): 37-48.

Schwitzer, Alan M., Julie R. Ancis, and Nina Brown. Promoting Student Learning and Student Development at a Distance: Student Affairs Concept and Practices for Televised Instruction and Other Forms of Distance Learning. Lanham, MD: ACPA, 2001.

Swan Karen, Peter Shea, Eric E. Fredericksen, Alexandra M. Pickett, and William E. Pelz.

“Course Design Factors Influencing the Success of Online Learning.” EDRS database.
WebNet 2000 World conference on the WWW and Internet Proceedings. 30 Oct.– 04
Nov. 2000: San Antonio, TX, 512-18.

Tebeaux, Elizabeth. “Technical Writing by Distance: Refocusing the Pedagogy of Technical Communication.” Technical Communication Quarterly 4 (1995): 365-93.

Annotated Bibliography: Distance Education for Technical Writing

Clark, Lawrence J. "Web-based Teaching: A New Educational Paradigm." Intercom 48.5 (May 2001): 20-21.

Lawrence Clark provides helpful tips how to maintain important features as collaborative working, class discussions, and critical thinking in a virtual learning environment. The author recommends to focus on the course content and to keep the technology as simple as possible.

**Farrell, Barbara. "Developing a Successful Online Class: What Works to Keep the Students Motivated and Interested?" Education at a Distance 15 (2001). 5 Nov. 2001
<http://www.usdla.org/ED_magazine/illuminactive/MAY01_Issue/article08.html>.**

Barbara Farrell removes the myth that teaching online classes is easier than on-campus classes. She gives some examples what instructors should consider when developing an online course. Farrell mentions the importance of a clearly structured syllabus (or outline) because an online course does not offer a weekly meeting with the class to clarify misunderstandings. She then discusses the importance of mixed media usage to deliver lecture notes. The delivery should be stimulating and informative to keep the students interested in the course. A further important factor is interpersonal communication between instructor and students, including student evaluation and feedback.

Foreman, Joel. "The All Digital Distance Writing Course." THE Journal 26 (1998): 76-78. 31 Oct. 2001 Corporate Resource Net database: Corporate Resource Net.

The author describes how he teaches an advanced business writing class online using the collaborative writing software CommonSpace. CommonSpace is a word processing software which works with a linked-column feature. The students' original text and the corrected text passages are separated but linked with highlighted features. In contrast to the 'track changes' feature of MS Word, the original document does not become overwhelmed with editing remarks and the changes are better to follow.

Because this is the only article that explains in detail how to conduct the writing process online it is a must read for any instructor interested in teaching a writing class online.

Gillette, David. "Pedagogy, Architecture, and the Virtual Classroom." Technical Communication Quarterly 8 (1999): 21-36.

This article describes how to teach professional writing in an online environment that includes professional-level collaboration, peer editing, academic instruction and discussion of theoretical issues.

Hanna, Donald E., Michelle Glowacki-Dudka, and Simone Conceição-Runlee. 147 Practical Tips for Teaching Online Groups: Essentials of Web-Based Education. Madison, WI: Atwood, 2000.

The authors provide very helpful tips for teaching online classes. Their 147 practical tips help instructors to develop an effective interactive learning environment and warn for pitfalls that the new technology offers. The book consists of four chapters beginning with a solid analysis of teaching philosophy, several skills and expectations for the learners. Then they clear several myths about online learning and teaching. In the third chapter the authors describe how to organize the online course. The last chapter provides helpful insights of how to implement the course design and begin with the online instructions.

The '147 Practical Tips for Teaching Online Groups' is a helpful reference source from the first stage of planning, through implementation, and finally teaching online classes.

Kearsley, Greg. Online Education: Learning and Teaching in Cyberspace. Belmont, CA: Wadsworth, 2000.

Greg Kearsley provides a very good introduction in the field of online education. He discusses both theoretical and technical approaches to the topic, gives valuable technological explanations, and refers to Web sites for further information. Kearsley also analyzes online education in the realm of organizations and networking, policy issues, education in the information age, and its future direction. The book finishes with a chapter of resource information, case studies, and a glossary. This book is a must read for everybody interested in online education!

Leonard, David C. "Using the Web for Graduate Courses in Technical Communication with Distant Learners." Technical Communication 43 (1996): 388-401.

David Leonard identifies four core elements that are essential for a successful distance learning graduate program: instructor, students, technological support, and administration. The core elements identify different roles and responsibilities which are essential in planning, developing and executing online courses. This article provides interesting aspects and helpful tips for developing a distance education program.

Lockwood, Fred, and Anne Gooley, ed. Innovation in Open & Distance Learning: Successful Development of Online and Web-Based Learning. London: Kogan Page, 2001.

This book is a collection of 19 articles about open and distance learning. The articles provide a record of the authors' experience and findings. The authors describe the current state of the distance education industry by discussing several issues such as education, technology, finance, organizational implications, human resources, and media use. Lockwood's and Gooley's edition is too broad for the field of technical writing.

Mabrito, Mark. "Facilitating Interactivity in an Online Business Writing Course." Business Communication Quarterly 64.3 (2001): 81-86.

The author discusses four types of online interactivity: navigational, functional, adaptive and collaborative. Taking his business writing class as an example, the author shows how to promote class discussion and collaborative writing in a virtual environment by using Perl scripts and CGI programs.

MacLeod, Laura. "Computer-Aided Peer Review of Writing." Business Communication Quarterly 62 (1999): 87-94.

The article discusses how to use the computer for peer editing, mentions two software applications (newsgroups and NetMeeting™), suggests how to prepare the students, and provides guidelines of conducting the review. The article finishes with students' comments about the computer peer reviews.

**Mason, Robin. "Models of Online Courses." ALN Magazine Oct. 1998. 2 Oct. 2001
<http://www.aln.org/alnweb/magazine/Vol2_issue2/Masonfinal.htm>.**

Robin Mason gives a helpful introduction in understanding the history and pedagogic evolution of online courses. He describes three basic online course models and shows how the Open University conducts online education. At the end he summarizes the central issues of learning online that are crucial for successful online teaching and learning. Robin Mason's paper is very helpful because it focuses on online delivery and the implications for the technology and pedagogy.

Moore, Michael G., and Greg Kearsley. Distance Education: A Systems View. Belmont: Wadsworth, 1996.

The authors give an overview of the field of distance education. This is an introductory text that delivers a complex subject as simple as possible for an audience that starts to learn more about distance education. The authors give an overview what technology can be used and discuss the advantages and disadvantages. However, the authors touch computer mediated online education only on the periphery and do not specifically mention writing related issues of online education.

Moore and Kearsley's book helps to understand the educational specifics and concepts of distance education. It is helpful for newcomers in education but does not provide new and helpful information for experienced teachers who want to teach their courses online.

Palloff, Rena M., and Keith Pratt. Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom. San Francisco: Jossey-Bass, 1999.

Palloff and Pratt consider the learning community as a central feature in online education and concentrate on the “process of teaching and learning through the creation of an online community...” instead of focusing on technology, software and hardware issues (xvii). At first, they show how the traditional learning environment differs from learning communities in cyberspace. Then they develop a practical guide how to create an effective online learning community. The book ends with a chapter of syllabi examples, a glossary, and Internet resources for distance education.

Palloff and Pratt focus on online education but do not give specific information about online courses for technical writing. This book is helpful for developing a successful online learning environment but less useful for seeking information dealing with collaborative writing, editing and revising in online courses.

Sawyer, Paul R. “Evaluating the Design and Delivery of an Online Technical Writing Course.” Diss. Illinois State University, 1997.

Paul Sawyer analyzes his undergraduate online course in technical writing according to Leonard’s four core elements (students, instructors, technical support and administration). Sawyer focuses on students’ responses to the online experiences and gives helpful tips how to develop an online syllabus and how to deal with technological challenges. Sawyer’s dissertation can be helpful for instructors who want to develop an online course. However, the author does not refer to the specific issues of teaching writing classes such as peer editing and revision.

Schwitzer, Alan M., Julie R. Ancis, and Nina Brown. Promoting Student Learning and Student Development at a Distance: Student Affairs Concept and Practices for Televised Instruction and Other Forms of Distance Learning. Lanham, MD: ACPA, 2001.

This book is very helpful to get started in learning about basic features of distance education. It starts with an overview about higher and distance education in the United States. The authors then discuss the demographics of distance learners and how institutions should address these specific learners. However, the authors do not focus on a specific mode of distance course delivery such as online education. They take a general approach including online teaching, broadcast television (tele courses), and interactive audio-video classrooms. This book offers a wide range of references which are very helpful for further research about distance education.

Schneider, Suzanne P., and Clark G. Germann. "Technical Communication on the Web: A Profile of Learners and Learning Environments." Technical Communication Quarterly 8 (1999): 37-48.

The authors provide demographic data about age, gender, and ethnicity of distance education learners at the University of Colorado at Denver (CU-Denver) and the Metropolitan State College of Denver (MSCD). These data give a good impression of demographic differences between on-campus and distance education students. Unfortunately, Schneider and Clark rush through the implementation of interactive learning environment and do not show in more detail with what technique or procedure they teach writing and peer editing. The authors only mention that students can use discussion groups, chat and email to exchange assignments.

Swan Karen, Peter Shea, Eric E. Fredericksen, Alexandra M. Pickett, and William E. Pelz. "Course Design Factors Influencing the Success of Online Learning." EDRS database. WebNet 2000 World conference on the WWW and Internet Proceedings (2000): San Antonio, TX, 512-18.

This article discusses findings from a survey about students' satisfaction with distance education courses at the State University of New York (SUNY) learning network. The authors discovered the following three factors that contribute to the success of an online course:

- Transparent and consistent course design and interface
- Frequent and constructive interaction of the instructor with the students
- Real communication through dynamic discussions

These three factors are mainly embedded in an asynchronous online learning environment that turned out to be the wrong environment for collaborative work. The reasons for the failure of collaboration might lie in the asynchronous structure of distance ed classes, the difficulty to motivate students for online collaborative work, and the instructors' naivety about student collaboration. The study further shows that students' satisfaction with distance ed courses declines with the increasing demand to participate in group or cooperative work. Students thought that they learned less from collaborative work.

Tebeaux, Elizabeth. "Technical Writing by Distance: Refocusing the Pedagogy of Technical Communication." Technical Communication Quarterly 4 (1995): 365-93.

The author shows how she teaches her technical writing class and gives a general description about outline and instruction material. She discusses 15 results of her students' feedback which she sees as a basis for planning and teaching technical writing by distance. In her discussion about the disadvantages of distance instruction the author states clearly that teaching writing in an online environment leads to the loss of "the concept of 'teaming' and development of interpersonal skills through peer reviews..." (388).