

Multilingual Writing and Pedagogical Cooperation in Virtual Learning Environments

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Chapter 14

Incorporating International Collaboration and Usability Evaluation Into a Technical Communication Course

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ABSTRACT

This chapter describes how globalization and rapid technological change are transforming technical communication both in academia and the corporate world. Products and technologies are used by a variety of user groups, and usability has become an important requirement. The transnational pedagogical collaboration, the Trans-Atlantic and Pacific Project, has taken up the gauntlet by providing students with a simulated professional environment and sharing insights into collaborative writing, translation, and usability evaluation. By reflecting on previous studies and the author's experiences, this article explores issues relevant to teachers when incorporating international collaboration and usability evaluation into a technical communication course. It describes international student collaboration regarding usability practices and discusses the benefits and challenges of usability evaluation as part of international collaboration. It concludes by suggesting guidelines for teachers to facilitate international collaboration and usability evaluation in higher education setting.

INTRODUCTION

The importance of usability in document development has been recognized since the 1970s (Wright, 1979), and its importance grows as more and more people come to rely on technical documents in today's self-service society. The international ISO 9241-11 standard provides guidance on usability and defines it as a measure of the extent to which a given product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. For example, in an e-commerce checkout process, the process of going from the shopping cart to completing the order

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should be effective, efficient and satisfactory for the user. Nielsen (1993, p. 26) suggests that usability has five attributes: learnability, efficiency, memorability, errors, and satisfaction. Thus, it is a quality, but furthermore, the term usability can refer to a process (i.e. a methodology for creating products), techniques (i.e. specific methods or activities, such as contextual observation and usability testing) or a philosophy (i.e. a belief in designing to meet user needs) (Quesenbery 2003, p. 83).

Usability evaluation described in this chapter is part of the Trans-Atlantic & Pacific Project (TAPP) which has developed into a higher educational network of bilateral writing-translation projects (since 2000), bilateral translation-editing projects (since 2001), and multilateral projects (since 2010). Usability evaluation is part of multilateral writing-translation projects that involve co-authoring in Spain and the U.S., user-testing in English in Finland and in the U.S., and translation to French, Italian, and/or Dutch (Maylath, Vandepitte, et al., 2013; Maylath, King, & Arnò Maciá, 2013). The collaborative forms of learning in TAPP have been discussed in previous publications (see, for example, Vandepitte et al., 2015), and therefore the framework of this chapter is curriculum centered.

This chapter draws from Chong's (2012) notion that:

[T]he need for usability has developed in parallel to, but not always connected to, the need for international technical communication (ITC). As our workplaces become more globalized, it is imperative for technical communication programs to be infused with opportunities to understand, practice, and implement international communication.

The idea of incorporating international communication in technical communication programs is not new. Thrush, for example, suggested this in 1993 (see also Sadri & Flammia, 2003, p. 86). Typically, international technical communication is related to “cultural differences inherent in communicating with audiences other than [...] native English-speaking communities” (Bokor, 2011 p. 136). Hoft (1995) defines international technical communication as “the development of technical information that can be understood by a linguistically, culturally, and technologically diverse audience.” (p. 650). The concept of audience is central in international technical communication as in technical communication, although in international technical communication the awareness of cultural and linguistic diversity is emphasized. Moreover, in this chapter international technical communication is understood to also encompass international collaboration.

Thus, this chapter aims to explore the benefits and challenges of incorporating international collaboration and usability evaluation into a technical communication course. This chapter can offer instructors ways to improve their course design in an international setting. In order to do so, the author will first discuss in more detail the shift from document usability to user-centered design and user experience. Then the author describes the usability assignment and usability evaluation as part of the TAPP collaboration. In “Guidelines for Incorporating International Collaboration and Usability Evaluation into a Technical Communication Course”, the author proposes a description of guidelines that can be applied by teachers to facilitate both international collaboration and usability evaluation in higher education setting. The authors' suggestions are divided into three parts: 1) Before the collaboration (i.e. planning), 2) During the collaboration (i.e. implementation), and 3) After the collaboration (i.e. evaluation). Then, in the section “Future Research Directions”, the author suggests possible directions for future research. The article concludes with a summary of the guidelines.

BACKGROUND

Technical communication practitioners and researchers have long focused on usability (e.g., Kastman Breuch, Zachry & Spinuzzi., 2001, p. 226; Bartolotta, Bourelle & Newmark, 2017, p. 2). In the early days, the focus was mostly on the usability of documents, such as computer documentation and online help in the 1980s, but from then on:

Many technical communicators made the transition from writing as a user advocate to usability specialist – helping to build usability into products, doing user research and analysis, assuring usability through usability testing and other evaluation techniques. (Redish & Barnum 2011, p. 92)

Over the last almost four decades, the focus has shifted to user-centered design, “a longer, broader, and deeper infusion of a usability approach and toolkit throughout design and development, to UX (user experience) focusing even more broadly on the larger context of use” (Redish & Barnum 2011, p. 94). The transition results from the change of thinking: technical communication products were seen as communication taking many forms, and energy was put into user experience (Ames 2001, p. 139).

It is perhaps not surprising, then, that “[w]ith each step in this change, collaboration has become more critical” (Redish & Barnum 2011, p. 94), and that technical communication programs have needed to incorporate additional topics in the areas of collaboration and user experience (Spyridakis 2015, p. 27). The transition results in job titles and descriptions. Hayhoe (2007), for instance, lists a range of titles technical communicators hold: “usability expert, content management specialist, user experience designer, information development manager, instructional designer, user assistance professional, and Web master, to name only a few.” (p. 281).

The ground is fertile for the interplay of technical communication, and usability as technical communication is – as stated by Gurak & Lannon (2010, p. 5) – “user-centered communication” and “[t]echnical communicators are by training and necessity user-centered”, focusing always on “the audience, the people who will use whatever they are creating” and making “even complex interactions understandable and usable” (Redish & Barnum 2011, p. 92). Moreover, as Kastman Breuch, Zachry & Spinuzzi (2001, p. 227) state, “usability evaluators and technical communicators often share similar skill sets”, such as user analysis. In the 2010s, it has become obvious that “user experience drives technical communication”, as Samuels (2013) says in the title of his article in the Tech Writer Today Magazine.

In this chapter, usability evaluation is understood as an umbrella concept that encompasses expert-based usability inspection methods, i.e. methods where an evaluator inspects a product, in this case a document, as well as usability testing with users (Gray & Salzman 1998; Hartson, Andre & Williges, 2001). Usability testing can be seen as an approach to audience analysis whereby the people conducting the tests come to understand the users’ needs. Hence, it is not surprising that “technical communicators are being asked more often to conduct usability testing” (Kastman Breuch, Zachry & Spinuzzi, 2001, p. 226). As Rubin and Chisnell (2008, p. 21) note, “[t]he term usability testing is often used rather indiscriminately to refer to *any* technique used to evaluate a product or system”. In line with their clarification, in this chapter the term *usability testing* is used to refer to testing with real users, i.e. “testing participants who are representative of the target audience” (Rubin & Chisnell, 2008, p. 21).

Technical communication programs “are well positioned to address issues concerning audience, message design, and technology that are involved in usability studies,” and therefore they “can play a vital role in preparing students for usability” (Kastman Breuch, Zachri, & Spinuzzi, 2001, p. 224). Fur-

ther, in 2001, they argued that “little discussion in technical communication focuses on teaching classes in usability” (p. 224). Luckily the situation has changed over the past 15 years. In her in-depth study, Chong (2016) analyzed technical communication textbooks, anthologies as well as course syllabi and descriptions and found that usability has been widely implemented in courses and programs in the U.S. Her findings are in line with those of Meloncon and Henschel (2013) who analyzed U.S. undergraduate degree programs in technical and professional communication and found that more technical and professional communication programs are now requiring a course in usability. However, as noted by Chong (2016), “[d]espite the plethora of usability-focused research, our scholarship in technical communication contains surprisingly little discussion that directly focuses on usability practices or its implementation in the classroom” (p. 13). Therefore, this chapter attempts to focus on usability practices in an international collaboration setting.

TEACHING USABILITY IN A VIRTUAL CLASSROOM

Usability evaluation became part of the TAPP project in its very first iteration, in 2000, when students in a technical writing course at North Dakota State University (NDSU) in the United States conducted usability tests of instructions that they had written and which they then sent for translation to students in an introductory translation course at Belgium’s University College Ghent (UCG). Within the TAPP project, international collaboration regarding usability started in 2010 when the Technical Communication Program at the University of Vaasa (UVA) in Finland joined the project. In Finland, usability evaluation took place in 2010 in an optional course called Technical Communication Project. Since 2012, due to changes in curriculum, usability has become compulsory in a User-Centered Technical Communication course in Vaasa. Since the Technical Communication Program at UVA is a joint MA program of the Department of Communication Studies and the Department of Computer Science, most of the students were either communication or computer science majors. However, both in 2010 and in 2012 there were also language and translation students in the course (English, Swedish, and German majors).

The User-Centered Technical Communication course is one of the two usability courses in the Technical Communication Program and is taught by the Department of Communication Studies. The other course is Analysis and Design of Human Computer Interaction taught by the Department of Computer Science. Both of the courses are obligatory to all students of the program, together with five other courses (i.e. two project management courses, a course on structured text and its tools, a course on concept analysis, and a research methods course). Students then take courses according to their curriculum which are different depending on their major subjects (i.e. communication studies and computer science). Both usability courses are planned in collaboration with instructors from both departments in order to avoid content overlapping and to design a coherent structure from the students’ perspective.

In the TAPP, usability evaluation has been part of various projects: In fall 2010 and fall 2015 usability evaluation was included in collaborative projects coordinated by faculty members at NDSU and UVA. In fall 2012, fall 2014, and fall 2016, engineering students from the Polytechnic University of Catalonia (Universitat Politècnica de Catalunya, UPC), Spain, joined the projects as subject-matter experts (SMEs). Thereby, as stated by Maylath, King, and Arnò Macià (2013), the TAPP provides realistic challenges, as engineering students at UPC take on the role of engineers while at the same time the technical writing students at NDSU take on the role of language experts (p. 161). Students work in small virtual teams comprised of technical writing students in the U.S., engineering students in Spain,

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technical communication students in Finland, and translation students either in Belgium, France, and Italy or in France and Italy.

The projects spanned approximately 14 weeks and comprised four phases:

Phase 1: Writing-for-translation-and-usability-evaluation

Phase 2: Translation

Phase 3: Usability evaluation

Phase 4: Project wrap-up

The flow of a multilateral project is illustrated in Figure 1.

Writing for Translation and Usability Evaluation

During the writing-for-translation-and-usability-evaluation phase, SMEs at UPC in Spain chose the topics and co-authored the documents (i.e. instructions) with NDSU students in the U.S. First the students at UVA familiarized themselves with the given topics, which were discussed during the lectures. Then the students formed pairs and selected a topic to work on. Students chose instructions that were testable, i.e. they had access to the equipment needed to conduct usability tests. The topics varied in terms of specialty as described by Maylath, King, and Arnò Maciá (2013):

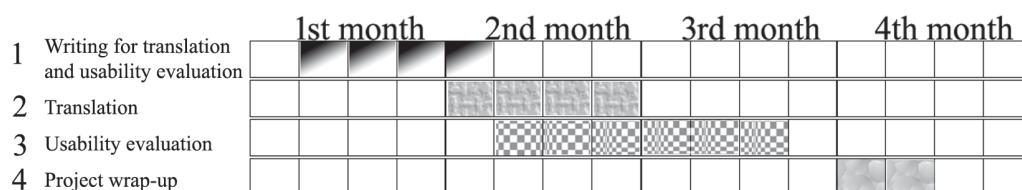
As SMEs, the engineering students chose the topics, some of which were highly specialized, in close relation to their studies, e.g., “How to conduct a Charpy impact test” and “How to use Ansys to make a water deposit,” while others were addressed to a wider audience, e.g. “How to create effects with Photoshop” and “How to make a Wiki text.” (p. 166)

The writers sent their first drafts to UVA students in Finland for usability evaluation in English. At the same time, the NDSU students began their own usability testing of their first drafts. Usability testing conducted by the NDSU students is discussed in more detail in Maylath, Vandepitte, et al. (2013) and Maylath, King, and Arnò Maciá (2013).

Translation

The writers then e-mailed their documents to their partners in Belgium, France, and Italy for translation. During the translation phase, the translation students were taught to ask their source-text writers for clarification of difficult passages, and the writers were engaged in answering questions about their texts from their partners abroad.

Figure 1. The flow of a multilateral TAPP project



Usability Evaluation

The usability evaluation phase at UVA spanned approximately 6 weeks, of which the actual testing spanned approximately two weeks. The usability evaluation at UVA had three steps: 1) planning, 2) evaluating and testing the documents and 3) writing a test report. Planning was integrated with lectures: students were familiarized with the characteristics of instructional texts, the concepts and tools of usability and user-centered design. This was done through readings assigned by the instructor (e.g. Barnum's (2002) *Usability Testing and Research* and Schriver's (1989) *Evaluating text quality: The continuum from text-focused to reader-focused methods*). As the course was taught in Finnish, it was crucial for students to learn central concepts of usability in Finnish, too. Therefore, the course book in Finnish by Ovaska, Aula & Majaranta (2005) was helpful. Decisions and actions related to the planning phase are discussed in more detail in an article by Vandepitte et al. (2015, p. 148). Students were also prepared for reporting their findings by readings on usability reports and discussing them with their partners abroad. In the 2015 project, the same book, namely Caddick & Cable's (2011) *Communicating the User Experience: A Practical Guide for Creating Useful UX Documentation*, was used for both classes in the U.S. and in Finland.

As soon as topics were chosen, students started discussing the usability of instructional texts regarding the chosen topics. For evaluation, students created a checklist based on previous research (Schriver, 1989; Nielsen, 1993; Isohella & Nissilä, 2015), characteristics of different instructions, and their own experiences. Students were encouraged to discuss the checklist with their partners abroad. An example of a checklist created by one group of students is provided in Table 1 (See Appendix 1). The usability course described in this chapter is taught by the department of communication studies which has a strong emphasis on terminology science and applied linguistics. In the 2016 project, emphasis was put on terminological usability, i.e. bringing together the principles of usability and user interface design and those of terminology work (Isohella & Nuopponen, 2016) as specialized words (terms) are central in technical texts. Behind the concept lies the notion that usability and the theory of terminology have the potential to be mutually beneficial (Isohella & Nissilä, 2015).

Students at UVA started evaluating the documents as soon as they received the first drafts from the writers, i.e. NDSU and UPC students. Some groups did the evaluation twice as the first draft was incomplete. After evaluating the documents, students conducted usability tests with real users who were accustomed to reading instructions in English. Before the testing began, students prepared test plans, i.e. described the conditions of the usability test sessions, such as the number of participants, tasks, the methods used to collect data, equipment, and environment. Testing methods and strategies varied depending on the topic. For example, the testing environment varied from computer classrooms to users' homes (at the time of the tests, the university's usability lab was under construction).

The primary purpose of the tests was to assess the usability of instructional documentation for the target audience, reading in English. Usability testing practices differed according to the usability test plans, which, in turn, were shaped by the topics. For example, for testing instructions for software applications, students recorded a video that showed participants' mouse movements across the screen. Students (as testers) observed participants completing tasks and recorded quantitative data, such as the amount of time taken to complete a task and the number of times a problem appeared. Testers also gathered qualitative data through observations, think-aloud protocols (i.e. participants were asked to perform a task and verbalize their thoughts while performing the task), and interviews. They recorded

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the participants' facial expressions and the verbal comments made during and after testing. Smartphones were used for both voice and video recording and for taking notes.

After the usability tests were completed, the UVA students wrote and then sent formal test reports in English to all parties, i.e. writers and translators. Especially at this point, literature on writing test reports was found useful. Test reports described the main findings with interpretations, usability issues, and specific suggestions for improving the instructions.

Project Wrap-Up

The project wrap-up phase consisted of a real-time videoconference connecting all parties simultaneously. A live videoconference was given a positive reception as for most students, this was the first time they saw or heard each other. During the project, most of the UVA students had relied on asynchronous communication such as e-mail, Google docs and Facebook. Asynchronous communication allowed them time to think as they were communicating in English, a foreign language to them. During the videoconference, students took turns discussing problems with translation and localization, terminology, and usability.

USABILITY TESTING AS PART OF INTERNATIONAL COLLABORATION: LESSONS LEARNED

There are many advantages of incorporating international collaboration and usability testing into a technical communication course. Students learned ways of implementing usability testing and research methods, and interpret and report results in English. The advantages of international collaboration lie in the students' shared experience and co-construction of knowledge through interaction with their peers. The UVA students welcomed the opportunity to communicate with the authors. They "learned to focus on the interpretation of a source text and its author's intentions via dialogue with the author" (Maylath, Vandepitte, et al., 2013, p. 72). Due to challenges in time management, students learned to adapt their usability testing methods and work under pressure. Having engineering students as SMEs linked the process to real-world practice. Usability testers had to familiarize themselves with topics that increased their understanding of engineering. Moreover, TAPP provides the possibility for comparison: "... as groups at different stages of training, different nationalities, and different educational backgrounds or settings engage each other in cross-cultural virtual teams, the possible factors to compare multiplies" (Vandepitte et al., 2015, p. 152). In usability testing, students are given a chance to compare usability testing processes, methods, and results.

In collaborating internationally, the challenges faced by usability teams can be organized into four categories: communication, time management, technology, and topics. Communication and time management are more general, whereas technology and topics are specific to usability testing. These challenges are interconnected; for example, technology challenges relate to topics.

Communication

Even though students were encouraged to communicate with their partners abroad, the amount of communication varied depending on the group. While in some groups students discussed the topics actively and exchanged ideas about usability testing, in other groups students limited their communication to what

was expected of them for the assignment. This is partly explained by the differing semester schedules and deadlines among the universities. Even though the TAPP projects spanned approximately 14 weeks, the actual time for student collaboration at all sites was about 8 weeks. Therefore, students had more time to work on site but less time to discuss with their international partners, as noted also by Vandepitte et al. (2015, p. 151). The usability testing process allows “for more international collaboration while planning and conducting usability tests” (Vandepitte et al., 2015, p. 151). Moreover, discussing the test results could also be done in collaboration.

Another aspect affecting the communication between the students is mentioned by Maylath, King, and Arnò Maciá (2013): “Engineers usually did not respond directly or immediately to the usability testers, they tended to look to their coauthors in the US as the information hub” (p. 175). This slowed down the usability testing process as the usability testers were waiting for answers to their questions in order to be able to proceed with the testing.

Time Management

One of the most discussed issues in international collaboration is time management. Regarding usability testing, the key factors are the differing semester schedules and deadlines among the universities, and scheduling the tests. TAPP requires a great deal of scheduling coordination. For example, the NDSU students started their semester in August, whereas students at UVA and UPS started in September. The translation students started the semester either in September or in October. As Maylath, King, & Arnò Maciá (2013) point out, in the 2012 project, “two of the translation classes started to translate the texts even before they could be revised with the benefit of test results.” (p. 174). Furthermore, Thanksgiving in the U.S. and Independence Day in Finland (6 December) as national holidays in the fall semester affected time management, especially if the partners were not prepared for them.

Meeting deadlines is another time management related issue and critical to the success of the project. As described by Maylath, King, and Arnò Maciá (2013): “With such a large number of people (over 100 participants including translation students) involved in the document’s supply chain, any delay with one student often meant a knock-on effect at all the other skill centers” (p. 176). For usability testers, being at the end of the chain, a delay, at worst, meant changes in the usability testing plan. For some UVA students, scheduling usability tests was challenging due to delays in document delivery. Especially for topics that required special equipment, for example a particular software version, students had to reserve a computer classroom. Some groups had to conduct their usability tests in the evening as it was the only time the classroom was available to them. Chong (2012) reports on challenges of scheduling the testing time with the users, which was not the case for UVA students. The reason for this is that, in most groups, the students themselves were the actual users. This is not necessarily a negative issue; on the contrary, Traynor and Hayhoe (2013, p. 1) argue that it is often advisable “to begin with activities where the students themselves are actual/potential users.” They justify their claim by pointing to the fact that “[g]etting students to participate in a test activity as both participants and test moderators allows them to gain insight from both perspectives.”

As students were situated in different time zones with a difference of eight hours, maintaining a dialogue in real time could have been challenging. Surprisingly, regarding usability testing, different time zones did not have much impact on collaboration. The reason for this might be, as stated earlier, that students had less time for discussions with their international partners.

Topics

Challenges related to technology often culminate in issues of lean (i.e. electronic mail) and rich media (i.e. video conferencing) (for more, see for example Flammia, Cleary & Slattery, 2016). Regarding usability testing, technology challenges were differences in equipment as explained also by Maylath, King, and Arnò Maciá (2013, pp. 172-173). The UVA students “employed the tools that were necessary to test the instructions which depended mostly on the topic of the text. For example, the instructions “How to program a small application in C” required students to use Programmer’s Notepad 2.3, Borland C/C++ 5.5, and a laptop (Windows 7) that was connected to a television screen” (Vandepitte, et. al 2016).

However, even though the “engineering students had been warned to choose topics for procedures that could be tested easily elsewhere and were simple enough for non-engineers to learn” (Maylath, King, & Arnò Maciá, 2013, p. 172), there were, especially in 2012 and 2014, topics that could not be tested by the UVA students. Some of the machine-specific topics, such as “How to design a machine part with NX.8.0.” were not testable at UVA, as the labs lacked the necessary equipment to test the procedures. Some of the topics were too complex for the students to handle in a short time (such as “How to make a solar power system”). Another technology-related challenge was that “some procedures required the use of additional machines not covered by the instructions” (Maylath, King, & Arnò Maciá, 2013, p. 173).

Topic choice forms the basis for incorporating international collaboration and usability evaluation into a technical communication course, as all decisions regarding usability testing culminate in topics, i.e. the product or service that is going to be evaluated and the type of users who would evaluate it. As discussed above, topics that are too complex (i.e. both instructors and students would need to study the subject first) or topics that need special equipment, are not suitable. Topic choice should not hinder students from forming groups and starting collaboration. Moreover, topic choice relates to time management: topics must be “realistic enough to address meaningful issues, but manageable within one semester” (Rosson, Carroll & Rodi, 2004, p. 36).

To summarize, then, due to the challenges mentioned above, the UVA students had to adapt usability testing to meet the changing circumstances. In so doing, they used the following techniques: (1) reducing the number of participants, (2) using students to act as end-users, and (3) choosing another, less time-consuming method. Based on suggestions by Nielsen (1993, p. 136), students had decided on a sample size of 3-5 users. However, as some students received the final version of the instructions later than expected, they settled for a sample size of 1-2 users in order to conduct the tests properly. For the same reason, some students ended up choosing participants among students (e.g. flatmates) with whom scheduling the testing time did not require a great deal of coordination. In some groups, students had chosen various methods for usability testing, for example think-aloud protocol, eye tracking and videotaping, but ended up using think-aloud protocol instead because of time constraints. As two students reported in their usability report, a simplified thinking aloud method with one test person was deemed sufficient enough to complement the evaluation.

Thus, the UVA students learned flexibility and adaptability. Even though most of them concentrated on one method, e.g. think-aloud protocol, in the project wrap-up they reported learning how to use the method in practice. In wrap-up discussions, they mentioned it was useful to experience how a few participants had to be constantly reminded to keep talking while performing the task.

GUIDELINES

As mentioned above, despite the benefits of incorporating international collaboration and usability evaluation, especially usability testing, as part of international collaboration, several challenges should be acknowledged. As described in previous chapters, the TAPP projects comprised four phases (i.e. writing for translation and usability evaluation, translation, usability evaluation, and project wrap-up), whereas usability evaluation at UVA occurred in three phases, i.e. planning, evaluating and testing, and writing a test report. With this in mind, the authors' suggestions for incorporating international collaboration and usability testing into a technical communication course are divided into three parts: 1) Before the collaboration (i.e. planning), 2) During the collaboration (i.e. implementation), and 3) After the collaboration (i.e. evaluation).

Planning

Planning is the most crucial phase in incorporating international collaboration and usability evaluation.

Challenges in communication, time management, technology and topics can be minimized by careful planning. Planning involves decisions at three levels, namely curriculum, course, and project levels. Decisions at curriculum and course levels are usually made by the instructor of the course, whereas project-level decisions are made in collaboration with other instructors. The author suggests two main guidelines for curriculum-level and course-level decisions:

Guideline 1: Implement international collaboration in an existing compulsory course on usability.

By implementing international collaboration in an existing usability course, it can be ensured that even if, for one reason or another, the international project is not achieved, the course will still be held. By implementing it in a *compulsory* course, it can be ensured that there will be enough participants for international collaboration. The instructor is usually also able to estimate the number of students taking the course which makes planning easier, for example, when discussing the number of groups with other instructors. Students are usually also motivated to take a course that is a part of their curriculum.

Guideline 2: Describe the course and its learning outcomes in a way that the course can be carried out flexibly.

An advantage of a broad enough course description is that completing the course does not entirely depend on an international project, i.e. the students are able to complete the course even if the project did not go according to their plans. An example of course learning outcomes from UVA states the following: "After completing the course, students will be able to understand the concepts of user-centered technical communication and usability from the technical communication perspective, describe the main principles of usability research, apply them to the course project, and justify the choices made." (Study Handbook 2016-2017). In this example, *course project* can be understood to refer to any kind of project, whether local or international.

All course-level decisions should be made at an early stage. The instructor of the course must decide how the international project will be matched with the course and its goals, for example, how big a part of the course the project is. In UVA, the TAPP project encompasses about 50% of the course, with the

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other half consisting of individual assignments based on literature on usability and usability evaluation methods reflecting and helping students to achieve course goals. When defining course policies, the instructor must decide how all the required work will be graded. In this case, 60% of the course grade is based on individual contributions (i.e. assignments based on literature) and 40% is based on team contributions (i.e. usability evaluation). In this way, students are likely to pass the course even if the project was not completed as planned.

In the planning phase, the most important decisions are project-level decisions made in collaboration with instructors at all sites. In particular, these include decisions on schedules and deadlines. To avoid, or at least to minimize, challenges in time management, the author suggests the following guidelines:

Guideline 3: Use a shared calendar and review it weekly.

Having a shared calendar for students and instructors helps keep everyone on track. Rosson, Carroll & Rodi (2004) emphasize the importance of “projects that are realistic enough to address meaningful issues, but manageable within one semester” (p. 36). In TAPP, the “joint semester” is even shorter, approximately two months, due to differing semester schedules. Therefore, a shared calendar helps the project participants – instructors and students – to map out the semester and communicate their priorities. As most work for the students conducting usability tests is done at the end of the document’s supply chain, a shared calendar is an essential tool for them to plan usability tests and reserve a usability lab or computer classroom with special software.

The calendar includes information on semester start and end dates at all participating universities as well as public holidays in each country. Moreover, it includes information on important deadlines in order to help students manage the workflow and keep up with deadlines such as usability test plans, usability tests, and usability test reports. As the calendar is updated regularly, it should be reviewed at least weekly in order to identify and resolve potential conflicts. In TAPP, a shared online calendar was implemented in 2014 as a Zephyr site created by a Ghent faculty member. Zephyr is a virtual learning environment (VLE) that incorporates various teaching and learning tools.

Guideline 4: Establish one particular time zone as the default.

Another way to minimize challenges with time management, as suggested by Anawati and Craig (2006) cited by St. Amant (2007), is to “establish one particular time zone as the default or the Standard Time for the class (e.g., U.S. Central Time) and inform students that times and dates in all related course materials and correspondences are based on that zone” (p. 23). As St. Amant (2007) adds, “[s]tudents would then be expected to translate all times and dates provided by the instructor in their local equivalents to synchronize their own schedules with that of the online course” (p. 23).

Implementation

Even though implementation varies from project to project, some guidelines could be given to minimize challenges with communication, time management, technology, and topics:

Guideline 5: Prepare the students for the project.

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In TAPP, over the years, the need for clearer structuring of the project and its different parts has arisen. The students “need clear insight into the role that their own class takes in the projects” (Maylath, Vandepitte, et al., 2013, p. 80). This applies also to students conducting usability evaluation. Even though the usability evaluation process as such might be clear and explicit to students, a deeper understanding needs to be gained of their role in the whole project. As mentioned by Maylath, Vandepitte, et al. (2013), readings about earlier TAPP projects could help the students to understand “their projects’ theoretical underpinnings and logistics” (p. 80).

The importance of preparing students for a collaborative online experience was already discussed in the 1990s (c.f. Bernard & Lundgren-Cayrol 1994; Keirns, 1998). As Bernard, Robo de Rubalcava & St. Pierre (2000) argue, learners do not naturally possess the prerequisites for skillful collaboration, or for “any form of online experience” (p. 266). In the last two decades, many students have been exposed to a variety of online learning experiences which does not eliminate the fact that the skills that are essential for effective collaboration “should be identified in advance and subsequently taught to learners in advance and then reinforced as the process proceeds” as suggested by Keirns (1998) cited by Bernard, Robo de Rubalcava & St. Pierre (2000). Therefore, simple preparatory assignments suggested, for example, by Bernard, Robo de Rubalcava & St. Pierre (2000, p. 266) are useful in acquainting the students with their peers and giving them experience in working with others online. They (2000, p. 266) mention conducting interviews with fellow students as an example. In TAPP, student exchange pre-learning reports about their individual backgrounds and expectations for the collaboration.

One of the main goals of TAPP is to strengthen students’ awareness of cultural differences, and as Maylath (1997) stated already twenty years ago, “[i]t is possible to teach technical communication students an awareness of language and the pitfalls of language in translation.” (p. 342). In his article, he focuses on developing international language awareness in technical communication students giving examples of student activities. Various methods can be used in practice when preparing students for intercultural communication in a usability course. In addition to readings on user-centered design in an intercultural context and cultural-specific usability testing, students can be given assignments that strengthen their awareness of cultural differences. For example, members of other cultures can be studied in one’s own country, as Beu, Honold & Yuan (2000, p. 350) suggest. They report of an internal research project on intercultural usability engineering in which focus groups (i.e. structured group discussions on a given topic) were set up with Chinese people living in Germany.

Moreover, students need to be prepared for terminology management, i.e.:

Any deliberate manipulation of terminological information [...] including all aspects of terminology used as a component of information and quality management, as well as the role that terminology plays in document production and corpus management. (Wright & Budin 2001, p. 372)

In doing so, students can, for example, familiarize themselves with Wettengel & Van de Weyer’s [2001] *Terminology in Technical Writing*. As Alberts (2000, p. 234) emphasizes, knowledge and information are disseminated through terminology. She points out that effective scientific and technical communication skills are developed through the use of correct and standardized terminology (p. 234).

In order to better prepare the students for the TAPP projects, the instructors have created an instructional 10-page document introducing the collaborative project and explaining the project phases. Moreover, the document describes the deliverables associated with the project and gives specific instructions

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for students at all sites. In this way, the students conducting usability evaluation are able to see what is required from the students writing the instructions and from the translation students.

The better the students are prepared for the project and know what is expected from them, the more motivated they are to communicate. At UVA, the students were informed at the beginning of the project that after completing it they would receive a certificate for project participation which they found motivating. Afterwards, one student reported that the certificate had helped him to get a job.

Traynor and Hayhoe (2013) argue that “[s]tudents need to be aware that [a usability] course will require a significant investment of time outside of class, working both individually and in teams, to plan, devise test materials, and prepare for the tests they will conduct.” Preparing the students for the project helps them also with time management, as they are informed about time requirements.

As stated earlier, all decisions regarding usability evaluation culminate in topics, i.e. the product or service that is going to be evaluated and the type of users who would evaluate it. In TAPP, topics were chosen by SMEs at UPC in Spain which simulates real-life conditions since technical writers and usability evaluators usually do not get to choose their projects. Therefore, it is necessary that SMEs decide the product that will be documented. However, in order to avoid or minimize the challenges discussed earlier, the author suggests the following:

Guideline 6: Guide the students in choosing topics.

Usability evaluation as described earlier can be conducted without having the actual product available. However, in order to make sure that students are able to proceed with usability testing, topics should be chosen so that they can be tested. Moreover, as suggested by Traynor and Hayhoe (2013), they should be “selected with the students’ knowledge of the product’s subject domain in mind”. They go on to say that “[w]here the domain might present a barrier, it is often possible to restate the problem and examine it in a context more familiar to the students”. However, in TAPP this is unlikely due to the complexity of the project. Therefore, emphasis must be put on topic choice. At the beginning of the project, time should also be reserved for discussions on topics. SMEs could share their ideas with other participants before choosing the topic. In TAPP, this could first be done in an open discussion forum as students later form small groups according to topics.

Guideline 7: Be prepared for changes.

No matter how well incorporating international collaboration and usability evaluation into a technical communication course is planned and implemented, there will be changes. Therefore, the instructor should try to keep one step ahead and monitor what is happening. This can be done through weekly discussions with students, both in class and online, and by creating alternative scenarios, such as what to do if a student drops the course or the instructions cannot be tested, for one reason or another. In TAPP, in some years, the UVA students have chosen two topics instead of one and conducted usability evaluation on both of them. In doing so, they were able to compare the instructions. In this way, it was also ensured that at least one topic got properly tested, especially if one of the other instructions was received later than expected. Adapting to changes in TAPP is discussed further in Moustén, Maylath, Vandepitte & Humbley (2010).

Evaluation

In order to improve the ways of incorporating international collaboration and usability evaluation into a technical communication course, comprehensive feedback and data should be collected. This should be done during the whole process, but since – at least in TAPP – usability tests are conducted at the end of the project, most of the feedback is received then. In TAPP this happens after the students have submitted their usability test reports and post-learning reports and are starting to prepare for the real-time videoconference (i.e. project wrap-up phase). A real-time final videoconference connecting all parties simultaneously has proved to be very useful in summing up the project. However, the videoconference alone does not suffice due to the large number of participants and limited time. Therefore, additional time for wrap-up discussion should be reserved.

Guideline 8: Reserve time for wrap-up discussion.

At UVA, a wrap-up discussion is done right after the real-time videoconference mainly for two reasons: firstly, as the videoconference takes place at the very end of the semester, there are limited possibilities to schedule another meeting after the videoconference. Secondly, students are already in the mood of talking about the project, which makes it natural to continue the discussion.

Moreover, time should be reserved for wrap-up discussions among instructors. It is also important that detailed notes are taken and shared for future reference.

FUTURE RESEARCH DIRECTIONS

As Gray and Salzman (1998) state, “[i]n the cause of usability, doing something is almost always better than doing nothing” (p. 207). This statement can be applied to incorporating international collaboration and usability evaluation into a technical communication course: doing something is always better than doing nothing – and although a lot has been done, there are still issues that might be advantageously considered in future research. Future research might, for example, explore how usability instruction has been implemented in courses and programs outside the U.S. – especially from the international collaboration point of view.

While the usability tests described in this chapter have been conducted separately at each site, a natural next phase would seem to be having students from different universities (i.e. NDSU in the U.S., UPC in Spain, and UVA in Finland) plan and conduct usability tests together. Although it would increase the complexity of the project and certainly bring challenges not just to students but also to instructors, it would constitute an opportunity to contribute to theoretical perspectives on the impact of international collaboration in usability practices and strategies. Moreover, it would respond to the need for “addressing practice-level challenges in usability [...] in our pedagogical and scholarly discussions”, as argued by Chong (2016, p. 23). In TAPP, usability evaluation has focused so far on user instructions but a natural direction is to test a variety of products, such as online media (websites, social media, etc.) and applications, i.e. “products that technical communication professionals create and work on” (Spyridakis 2015, p. 35).

TAPP collaborations provide possibilities for applying remote usability testing, which refers to a variety of research that falls into two categories, synchronous and asynchronous. Synchronous testing

involves real-time interaction between the tester and test participant whereas in asynchronous testing the test participant performs independently (Williams & Valla 2014, pp. 101-102). Asynchronous testing methods could offer an attractive alternative to usability testing in international collaboration, where students are physically separated and working in different time zones.

Furthermore, while there is a need for developing strategies for teaching and implementing usability in technical communication curricula (Chong 2016), there is certainly a need for future research on usability practices and strategies in international settings – and how to apply them to usability instruction in technical communication programs in a way that they prepare students for communication in cross-cultural contexts.

CONCLUSION

The continuously changing and evolving technology provides users with faster methods for reaching their goals through technical devices. At the same time, it poses challenges to usability. Technical communicators as globalized knowledge workers are in a central position in communicating technical information.

This chapter has discussed the benefits and challenges of usability evaluation as part of international collaboration in a higher education setting. Unquestionably one of the most important benefits is the possibility of teaming up groups of students with different backgrounds bringing their user-centered approach and communication skills to international teams. Students devote time to learning about instructional documentation, the background of human factors, and usability evaluation methods through lectures, literature and class discussions, but most importantly, through international collaboration projects, such as TAPP, mirroring real-life conditions. To sum up, they learn about usability in different institutional and cultural contexts.

Challenges discussed in this chapter regarding international collaboration and usability evaluation, especially usability testing, were used as a starting point for the development of guidelines for incorporating international collaboration and usability evaluation into a technical communication course:

- Implement international collaboration in an existing compulsory course on usability;
- Describe the course and its learning outcomes in a way that the course can be carried out flexibly;
- Use a shared calendar and review it weekly;
- Establish one particular time zone as the default;
- Prepare the students for the project;
- Guide the students in choosing topics;
- Be prepared for changes;
- Reserve time for wrap-up discussion.

Even though the guidelines are based on findings concerning international collaboration projects on usability evaluation, most of them are broad enough to be applied to facilitate international collaboration in the first place. The author hopes that these guidelines will increase incorporating international collaboration and usability evaluation into technical communication courses, and consequently, improve students' international technical communication skills, including usability evaluation skills.

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KEY TERMS AND DEFINITIONS

Cross-Cultural Virtual Team: A team of students from different cultures collaborating with each other online only.

Eye-Tracking: A method which records a person's eye movements across the screen while performing a task.

Think-Aloud Protocol: A method in which the user says out loud what s/he is thinking while performing a task.

Usability: The ease of use with which users can use a product or a service to achieve their goals.

Usability Evaluation: An approach to identifying specific problems with usability of products or services.

Usability Testing: An activity of collecting empirical data while observing testing participants who are representative of the target audience using the product to perform realistic tasks.

APPENDIX

An example of a checklist for the heuristic evaluation created by one group of students.

Table 1. Criteria for the heuristic evaluation of a user guide

AUDIENCE	
1.	Has the (primary) audience been taken into account?
2.	Have other possible user groups (secondary audiences) been taken into account?
3.	Have the operating situation and environment been taken into account?
TOPIC	
4.	Was the manual designed for a specified task?
5.	Has the topic been limited appropriately (e.g. concise/extensive enough)?
6.	Is the topic current and up-to-date?
LAYOUT	
Satisfaction	
7.	Does the document look inviting?
8.	Is the layout of the document satisfying?
Clarity	
9.	Is the document clear (e.g. grouping, positioning, font)?
10.	Are the most important aspects given emphasis (e.g. color, boldface, size, use of empty space)?
Consistency	
11.	Are typographical conventions being followed (e.g. boldface, italics, underlining)?
12.	Is the document easily browsable (e.g. headings, spacing, use of empty space)?
CONTENT	
Limitation and Appropriateness	
13.	Is the document as short and appropriate as possible?
14.	Is there any overlapping or unnecessary information?
15.	Is the right kind of action encouraged?
Learnability	
16.	Is the content understandable and learnable?
17.	Is the level of conceptualization concrete enough?
18.	Is the language clear (e.g. terminology, sentence structure)?
19.	Are the terms and examples from fields familiar to the audience?
Consistency	
20.	Is the order of presentation logical?
21.	Is the document divided into steps (e.g. headings, numbering)?
22.	Is the language of the document consistent (e.g. one term for one concept)?
23.	How do the images and text interact? What is the purpose of the visual elements?
Flawlessness	
24.	Is the language free of errors?
25.	Is the content accurate and flawless?
26.	Is the content complete (e.g. no missing steps)?