

## *Exploring German preservice teachers' electronic and professional literacy skills*

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### **Abstract**

This article presents findings from an exploratory pilot project which aimed at fostering electronic and professional literacy skills of preservice language teachers through computer-mediated peer collaboration. The research context is a qualitative case study involving cooperation via the email and chat functions of *FirstClass*<sup>®</sup> among preservice teachers at the Justus-Liebig Universität in Giessen and the Pädagogische Hochschule Heidelberg in Germany. The author investigates participants' prior experiences with regard to computer skills, Internet proficiency, and technology-based language learning and teaching. Next, she discusses benefits and challenges for preservice teachers with respect to collaborating via computers (computer-mediated communication or CMC) with their transatlantic partners. In collecting and analyzing preservice teachers' reflections, a Grounded Theory approach (Strauss & Corbin, 1998) was used. Instances of electronic and professional literacies were identified and triangulated with data from pre-course questionnaires, post-course self-assessments, logs, email and chat transcripts, and field notes. The author discusses benefits and challenges which preservice teachers encountered through the collaboration. Findings include preservice teachers' differing levels of electronic literacy skills, tolerance for ambiguity, institutional constraints, peer feedback, and perception of the final product. Based on her findings, the author stresses the need to encourage preservice teachers' meta-level reflections on the challenges of the collaboration and suggests conducting longitudinal follow-up studies in order to investigate if and how in-service teachers apply the knowledge they gained from their teacher education program to their own teaching.

Keywords: computer-mediated communication (CMC), electronic literacy, teacher education, collaboration, qualitative study, grounded theory.

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### **1 Introduction**

It has been argued that preparing students to function in the networked society should play a major role in English language instruction because of the status of the English language as the lingua franca of the global society (Warschauer & Healey, 1998). Yet, in order for language teachers to be able to equip their students with the necessary electronic literacy skills, teachers ideally possess such electronic literacy skills

themselves. In addition, technology-based language teaching contexts require teachers to exhibit simultaneously pedagogical, technical, organizational, and managerial skills (Berge, 1995). The literature on teacher education advocates a strong need for teacher educators to train future teachers in using technology in their own classrooms through model learning (e.g., Munday, Windham & Stamper, 1991; Wetzel, 1993). Based on the call for modeling authentic uses of technology (Willis, 2001: 309), this study aimed at fostering German preservice teachers' electronic and professional literacies through a computer-mediated communication (CMC) project.

The research context for this pilot involved CMC-based collaboration among preservice teachers at two German universities who collaboratively designed web-based modules for English language teaching (<http://www.unigiessen.de/anglistik/tefl/> (>Seminar Projects>Exploring the Potential of the New Media in ELT, SS2002)). Research questions include the following: What are German preservice teachers' prior experiences with regard to computer skills, Internet proficiency, and technology-based language learning and teaching? What are benefits and challenges for preservice teachers with respect to collaborating via CMC with their transatlantic partners?

## 1 Theoretical framework and prior research

### 1.1 Electronic and professional literacy skills

Shetzer and Warschauer support the notion of electronic literacy as a framework as it has become increasingly important to use computers not only for reading and writing in the new medium but also for interpreting and expressing meaning. Electronic literacy looks at how people use computers for interpreting and expressing meaning and also includes the ability to read and write in a new medium as well as "information literacy" (2000: 173), i.e. the ability to find, organize, and make use of information. In addition, according to the European Centre for Media Competence (*Europäische Zentrum für Medienkompetenz*), media literacy contains competencies such as being able to reflect on and evaluate the content of offers and services and dealing with such materials in an effective, creative, and critical way as well as to take active part in responsibly and consciously dealing with the challenges posed by the information society (as cited in Hillebrand & Lange, 1996: 35-36).

In brief, electronic literacy, information literacy, and media literacy (hereinafter "electronic literacy") may be characterized by the following abilities:

- a. Reading, writing, interpreting, and expressing meaning in the computer medium;
- b. Finding, organizing, and making use of information;
- c. Reflecting on and evaluating the content of offers and services;
- d. Dealing with such materials in an effective, creative, and critical way;
- e. Participating actively, responsibly, and consciously in dealing with challenges.

### 1.2 Professional literacy

Willis (2001) has introduced the term *professional literacy*, which seems to best capture the skills required by teachers who use technology in their teaching, because the term

also encompasses the pedagogical, technical, organizational, and managerial skills teachers ideally possess (see Berge, 1995). “[G]eneral computer literacy (operating systems, word processing, spreadsheet, database, and telecommunications) is not sufficient to prepare preservice teachers to use technology in their classrooms” (Willis, 2001: 307). Instead, Willis calls for “professional literacy,” which he defines as follows (*op. cit.*, 307-309):

- (a) Familiarizing oneself with the literature on benefits of using technology in education;
- (b) Basic understanding of how computers and related technology can be used in education;
- (c) Specific novice skills for integrating technology into the curriculum at the grade level and in the subject(s) preservice teachers plan to teach;
- (d) Being able to frame problems and to solve problems on-the-fly;
- (e) Going beyond learning recipes for certain types of technology use or technically correct implementations of plans developed;
- (f) Observing teacher educators, content specialists, and mentor teachers modeling innovative uses of technology to support learning.

Supporting the development of professional literacy in addition to electronic literacy seems important for preservice teachers because it may help them with the following:

- Becoming a designer and evaluator of learning activities, contexts and environments to effectively link learning processes to curricula;
- Evaluating, and critically interpreting net-based information;
- Being able to prepare learners for the professional world;
- Staying informed about the impact that computer technologies have on one’s own work context;
- Participating actively and responsibly in and consciously dealing with challenges posed by the information society;
- Experiencing authentic and creative uses of technology (i.e., integrated into their course work and field experiences) instead of laboratory exercises;
- Encountering opportunities to develop and teach technology-supported lessons themselves under circumstances that support professional growth.

### ***1.3 Prior research***

Prior research has focused on connecting teachers, students, or mentors with each other to support the development of electronic and professional literacy skills. For example, projects such as the International Leadership for Educational Technology offer online learning environments and transatlantic collaboration for PhD students in educational technology or multimedia, teacher education, or higher education (Davis, Hagenon, Nilakanta, Fraser, Lopez Fernandez, Nyvang & Ellis, 2004). The Alberta Language Learning Environment at the University of Calgary provides seminars, workshops, and lectures for supporting in-service foreign language teachers who are learning to integrate technology (<http://www.fis.ucalgary.ca/~alle>; see Enns, 2005). Other projects emphasize

CMC-based peer collaboration (e.g., Lord & Lomicka, 2004), novice-expert collaboration (e.g., Gimbert & Zembal-Saul, 2002; Meskill, Mossop, DiAngelo & Pasquale, 2002), or novice-mentor collaboration for teachers in their content areas, and aim at enabling them to use technology independently in their teaching through the design of online courses (e.g., Koehler, Mishra, Hershey & Peruski, 2004). Using computer technologies to connect preservice teachers with students has also been successful in fostering teachers' acquisition of literacy practices (e.g., Doering & Beach, 2002; Legutke, Müller-Hartmann & Schocker-v. Ditfurth, 2002). Moreover, providing faculty and students with the necessary resources for methods courses and modeling appropriate uses of technology resulted in supporting teacher education students with applying technology in lessons and units (Krueger, Boboc, Smaldino, Cornish & Callahan, 2004: 203). Adams found that a field-based strategy for technology training helped MA degree candidates in a curriculum and instruction program to apply their newly gained technology skills to their teaching, to advance their technology self-assessment, to learn from fellow teachers, to become more confident and comfortable with computer use, and to shift substantially in their view towards computers (Adams, 2005: 493). This study complements the recent work cited by modeling web-based task design and computer-mediated peer collaboration for preservice teachers with the overall goal of fostering not only their electronic literacy but also their professional literacy skills.

## 2 This study

### 2.1 Participants

This qualitative case study was the pilot for a larger Ph.D. research project (see Fuchs, 2006) and took place during the summer semester in 2002. Subjects in this study consisted of fourteen German preservice teachers at the Justus-Liebig Universität Giessen, and twenty preservice teachers at the Pädagogische Hochschule Heidelberg. Preservice teachers were in the first phase of their university studies and working toward the first state exam (*Erste Staatsprüfung*) in order to become English teachers in the various state schools in Germany.<sup>1</sup> The collaborative course "Exploring the New Media in English Language Teaching" was offered as a regular core course (*Hauptseminar*) in both Giessen and Heidelberg, and participants signed up on a first-come-first-served basis. Furthermore, participants had been informed that their voluntary participation in this CMC-based collaboration would serve research purposes. Preservice teachers formed seven local groups at each institution with two members per group in Giessen and two to three in Heidelberg. The seven local groups then merged to form seven cooperative Giessen-Heidelberg groups. All preservice teachers used the email and chat functions of *FirstClass*<sup>®</sup> as a working platform to collaboratively design web-based modules for English language teaching. Both courses took place synchronously in computer rooms for three hours once a week. During this class period, participants could also conduct in-class chats. One main advantage of such chats was the

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<sup>1</sup> The second phase of teacher education in Germany typically includes a second two-year phase, i.e. the *Referendariat*, which culminates in the second state exam (*Zweite Staatsprüfung*).

opportunity to get immediate feedback from the groups on the other campus. Additionally, as most group chats were conducted exclusively in English as the working language, this may have also helped in fostering preservice teachers' fluency in the target language (e.g., Kern, 1995). Groups were formed according to participants' interests in project-based themes and target student populations. Each group designed web-based activities based on a short novel about the conflict in Northern Ireland (see also Fuchs, 2003; Müller-Hartmann, 2000). The twelve-week collaboration was split up into the following three phases.

### ***2.2 The experimental phase (Phase One)***

As an introductory reading, participants at each institution read the novel "Torn Away" (Heneghan, 1999). Tasks for Giessen participants involved designing technology-based prompts for the novel and sending them to their partners in Heidelberg for feedback. The prompts had been designed in a way which asked EFL learners to visit specific websites on Northern Ireland and/or Canada to solve the tasks. In order to guide learners, groups also created a criteria list for critically evaluating websites with regard to content, layout, and reliability of sources. These tasks formed the starting point for the cooperative groups' joint modules.

### ***2.3 The project phase (Phase Two)***

Project requirements included carefully describing the teaching context, target student population, (sub)topics, project tasks, and clear guidelines for students and teachers. Each cooperative group could choose class levels and topics and was in charge of splitting up into sub-groups and dividing up the tasks. For instance, Group 1 designed a web-based project on the Northern Ireland conflict targeted at German students in grades nine or ten. Teaching units aimed at fostering learners' electronic literacy skills such as navigating the Internet. All group projects were posted on the homepage of the Giessen TEFL Department (<http://www.uni-giessen.de/anglistik/tefl> (>Seminar Projects>Exploring the Potential of the New Media in ELT, SS2002)).

### ***2.4 The assessment phase (Phase Three)***

Once all the projects had been published on the web, each group assessed their peers' final products by providing written commentaries on both content and layout. In addition, in post-course self-assessments, participants reflected upon their learning process and progress and their group work contribution.

## **3 Methodology**

### ***3.1 Participant observation and data triangulation***

In this study, the author's status was that of course designer in collaboration with both the Giessen and the Heidelberg teacher educators. In her role as participant observer in

Giessen (e.g., Denzin, 1989), the researcher took field notes, team-taught, and facilitated group work. More specifically, the researcher and the Giessen teacher educator commonly decided on the content for each session. The researcher also introduced the *FirstClass*<sup>®</sup> software. In this study, data triangulation (e.g., Strauss & Corbin, 1998: 44) involved gathering information by eliciting data through logs and descriptive quantitative instruments such as pre-course questionnaires and post-course self-assessments. Yet, in spite of meticulously triangulating multiple data, Denzin cautions that “[o]bjective reality will never be captured. In-depth understanding, not validity, is sought in any interpretive study” (op. cit., 1989: 246).

### 3.2 Data collection instruments

The four-part pre-course questionnaire had been inspired by Levy’s “CALL survey” (1997: 233-239), and its purpose was to elicit information about preservice teachers’ biographical background, their language learning and teaching histories, their computer and Internet skills and experiences, and their language learning and teaching preferences. On a four-point Likert Scale, participants rated their computer skills and Internet proficiency, and their preferences with respect to using technology in language teaching. The reason for not including a neutral fifth point for either scale was to get a tendency. In their post-course self-assessment sheets, preservice teachers rated their class participation, preparation, contribution, learning resources, group work, and graded their overall performance on a 15-point scale ranging from “very good” to “unacceptable.” Participants also provided qualitative comments for each question. In addition, preservice teachers at each institution wrote statements commenting on what they learned in the seminar, what they found difficult, the quality of the teamwork, and on how this seminar compared to other ELT methodology seminars. Moreover, in on-going logs, participants commented on tasks and activities, their group work and related gains and difficulties. The purpose of the logs was to help preservice teachers reflect on their group work process and progress. Finally, the researcher also analyzed her field notes as well as email and chat transcripts from the groups. All names are pseudonyms, and all data have been kept in their original form.

### 3.3 Data analysis

For data analysis purposes, the author used Strauss and Corbin’s *Grounded Theory* approach (1998), which refers to theory derived from data which was systematically gathered and analyzed through the research process. In this method data collection, analysis, and eventual theory are in close relationship to one another. In other words, researchers usually do not start with a preconceived theory in mind. Instead, they begin with an area of study and allow the theory to emerge from their data. Furthermore, Strauss and Corbin argue that “[t]heory derived from data is more likely to resemble the “reality” than is theory derived by putting together a series of concepts based on experience or solely through speculation (how one thinks things ought to work)” (op. cit., 1998: 12; quotes and brackets in original).

To break down and analyze the qualitative data, the author conducted open, axial, and

selective coding phases (e.g. Strauss & Corbin, 1998: 82-83, 119, 123, 156). For example, Jasmin of Giessen Group 7 stated that she “will have to plan, organize, make appropriate worksheets for my student, search for useful information etc.” As a result, “plan, organize, make, search” served as *in vivo* codes, i.e., as codes taken from the subject’s own words (Strauss & Corbin, 1998: 105). Next, other instances of preservice teachers expressing similar opinions were compared and contrasted so as to make connections between categories to form subcategories during the axial coding stage. Finally, the central categories which emerged when coding selectively were then looked at in light of pre-existing categories from the literature (or *constructed codes*, see Strauss & Corbin, 1998: 115). For instance, “finding, organizing, and making use of information” (Shetzer & Warschauer, 2000: 173) served as a *constructed code* in this study. To guard oneself against the threat to external reliability, Nunan proposes to have other people help with data analysis to reach inter-rater reliability (1992). Consequently, the researcher discussed her preliminary results with the Giessen Research Colloquium for Foreign Language Teaching and Digital Media, Section 8 of the Giessener Graduiertenkolleg Kultur (see Fuchs, 2003). Additionally, the researcher included her own interpretations of observed behavior and actions and combined them with participants’ articulated introspections in pre-course questionnaires, logs, and post-course self-assessments. Including these perspectives served the purpose of double-checking the results obtained with one method. Nevertheless, generalizability is not sought in this study due to a lack of random assignment of subjects to experimental and control treatments (see Nunan, 1992: 63-69).

#### 4 Findings

This section presents mean scores with regard to participants’ computer skills, Internet proficiency, and technology-based language teaching preferences prior to participating in the project (Section 4.1). Additionally, preservice teachers’ self-assessed benefit from their CMC-based group work (Section 4.2) and results from their logs are presented (Section 4.3).

##### ***4.1 Pre-course questionnaire results: computer skills, Internet proficiency, language teaching preferences***

In order to get an overview of participants’ prior experience with computer technology and group work, groups at each institution were asked to rate their computer skills and Internet proficiency on a four-point Likert scale ranging from “insufficient” (1) “satisfactory” (2) and “good” (3) to “very good” (4). 26 out of 34 participants responded (76.5%).

With regard to rating their computer skills prior to starting the course, participants assigned the lowest mean scores to the ability to use *presentation software* and *CDRoms for teaching English* (both 1.5). Scores ranked slightly higher for working with the *FirstClass@ conferencing software* (1.9), while using *email programs* (2.8) and *search engines* (3.3) ranked the highest. In terms of self-assessing their Internet proficiency, preservice teachers gave web-based language teaching the lowest mean score (1.6). The second lowest scores they assigned to participating in discussion forum and chat (both

1.8). Participants also felt their Internet proficiency was “satisfactory” with regard to *email exchange projects* (2), *Internet research projects* (2.2), and *identifying materials for class use* (2.4). Moreover, they assigned the highest score to their ability to do *research on the World Wide Web* (2.9).

When asked about their language teaching preferences, mean scores turned out relatively high. On a four-point Likert Scale ranging from “not important at all” (1) “not important” (2) and “important” (3) to “very important” (4), preservice teachers considered using *email in FLT* (3.3), using the *Internet for FLT* (3.1), as well as *fostering learners’ electronic literacy* (3.1) as “important.” Moreover, using *CDRoms for FLT* (2.9) and *using web-based programs for FLT* (2.7) received scores close to “important,” while using chat for FLT (2.5) ranked in-between “not important” and “important.” Furthermore, preservice teachers ranked the *emphasis of in-class computer work in previous classes they took* as “very weak” (1.2) on a four-point Likert Scale ranging from “very weak” (1), “weak” (2), and “strong” (3) to “very strong” (4). Lastly, preservice teachers considered the *emphasis of in-class computer work in previous classes they taught* as slightly higher than “weak” (2.25).

#### 4.2 In-course feedback: log entries regarding challenges encountered

Eleven out of 34 preservice teachers turned in their Log One (32.4%). Findings showed that the majority (n=7) reported “no problems,” while four preservice teachers indicated difficulties with the software. More specifically, participants stated they had problems with *FirstClass®* (e.g., difficulties handling and getting used to software; unable to properly log on) and with the Windows operating system: “Never had a computer as a friend.” The return rate for Log Two was higher since 25 out of 34 participants responded (73.5%). While two preservice teachers reported they had “no problems,” one participant did not answer this specific log question. A total of 22 preservice teachers listed numerous difficulties which were attributed to difficulties with technology such as the following: no joint chats, detailed discussion of the website, splitting up the work, working with *FirstClass®*, inefficient and ineffective chat (no real communication), partners’ non-participation in chats (partners did not appear serious about deadlines or did not follow messages posted in *FirstClass®*), unable to access previous work (system failure), slow with becoming electronically literate, a lack of technical know-how, and general computer problems (CMC not as easy as face-to-face). According to participants, other problems were geared toward the cooperation with their respective partner groups and included the following:

- Defining tasks;
- Partners unknown;
- Misunderstandings;
- Feeling of inferiority;
- Cooperation complicated and not helpful;
- Getting in touch at beginning;
- Not agreeing on content, tasks, (sub)topic(s);
- Partners lacking enthusiastic attitude toward project;
- Not meeting often enough; not jointly working on project, anxious because of deadlines.



### **4.3 Post-course feedback: self-assessed benefit from group work**

A total of 26 out of 34 participants turned in their post-course self-assessment (76.5%). When asked about how they perceived their benefit from the group work, slightly more than half of them (58%) thought they “profited a fair amount” from the group work (n=15), while 23% believed they “profited a lot” (n=6), and 19% felt they “did not profit much” (n=5). 0% indicated that they “did not profit at all.”

## **5 Discussion of benefits**

This section discusses the most important benefits and challenges in light of preservice teachers’ electronic and professional literacy skills.

### **5.1 Benefit one: reading, writing, interpreting, and expressing meaning in the computer medium**

Most preservice teachers felt they had acquired new skills such as working with the computer conferencing software and with Netscape Composer (now part of the Mozilla Suite), designing, using, and evaluating websites and web-based materials and tasks, and distinguishing between relevant and irrelevant information on the Internet. With regard to synchronous communication, many preservice teachers chatted in this seminar for the first time (e.g., Katja and Dorothy, Giessen Group 5; Silvia, Heidelberg Group 1; Katharina, Giessen Group 7). This may explain why preservice teachers had ranked their chat skills prior to the project only in-between “insufficient” and “satisfactory” (1.8), and why using chat for FLT only ranked in-between “not important” and “important” (2.5). Additionally, preservice teachers in this study did not make negative comments on their asynchronous communication via email. This seems to contradict Thorne (2003), who argues that email has become an antiquated means of communication for peer-to-peer communication, and that American undergraduates who participated in telecollaboration were more likely to use AOL Instant Messenger (54). Hence, the difference in use of synchronous and asynchronous CMC tools may be attributed to different cultural conventions (see also Reeder, Macfadyen, Roche & Chase, 2004). In this study, preservice teachers had ranked the importance of using email in FLT as more important (3.3) than using chat for FLT (2.5). One possible explanation could be that they considered communicating via email as a constructive, product-oriented activity (MacKinnon, 2004: 110-111), or that the overall grade for the project served as an “external motivator” (Stephens & Hartmann, 2004: 70). Another reason could be that participants had already felt more comfortable with email prior to participating in the project compared to chat (see Section 4.1).

### **5.2 Benefit two: finding, organizing, and making use of information**

Prior to starting the CMC-based collaboration, preservice teachers stressed the importance of integrating technology into foreign language teacher education. For instance, preservice teachers deemed it “important” to foster learners’ electronic literacy (3.1), to use email for FLT (3.3), and to use the Internet for FLT (3.1). Preservice

teachers tied the need for teachers to acquire and maintain electronic literacy to the fact that computer technology such as the Internet was becoming increasingly important in ELT methodology and in society in general.

Although preservice teachers appeared comfortable with using the Internet for their own research and activities (“good”), they did not seem to share the same comfort when it came to using the Internet in their own language teaching (“satisfactory”). According to their self-assessment feedback, preservice teachers benefited primarily from learning about the organizational and structural aspects of creating a website and from designing tasks for specific goals and aims. Likewise, preservice teachers expressed satisfaction with having had the opportunity to learn about the methodology of teaching English, the design, use, and assessment of web-based materials and their language appropriateness, about conducting group work over the Internet, and about the time-consuming organizational and planning aspects of CMC-based projects. These results seem to underline Wells’s (2002) call for “additional time and practice” for students to develop a more thorough understanding of the strategies used to integrate CMC into their own teaching.

### ***5.3 Benefit three: reflecting on and evaluating the content of offers and services***

It appears that several preservice teachers became aware of the motivational power of creating websites. According to Dorothy, “you can really be proud of yourself because it there was a lot of work behind it, which I wasn’t aware of. Evrytime I am looking at a website I will consider the work behind it.” This finding seems to be in line with Warschauer’s (2000) claim that “[a]gency is really what makes students so excited about using computers in the classroom: the computer provides them a powerful means to make their stamp on the world”. Other statements appear to confirm the claim that learners feel motivated to design and publish a lesson plan on “a real webpage” for someone else to use.

### ***5.4 Benefit four: dealing with materials in an effective, creative, and critical way***

Preservice teachers also seemed to have demonstrated a change of attitude toward using technology. This result is in line with Adams, who found a substantial shift in preservice teachers’ views towards computers (2005: 493). For instance, Dorothy (Giessen Group 5) stated that she was “a bit scared about creating a website” at the outset because she did not know how. However, she felt that she learned how to create the website step-by-step during the course. She also mentioned that she might do more websites because she thought that they were “fun.” Another example of a change of attitude is Jasmin (Giessen Group 7), who appeared to have changed from having been “sceptic about creating a website” to having gained “confidence and enthusiasm.” Jasmin felt that having witnessed the process of creating her own website had left her with the feeling of having “achieved something worthwhile.”

### ***5.5 Benefit five: participating actively, responsibly, and consciously in dealing with challenges***

As was highlighted in Section 4.3, the majority of preservice teachers (81%) felt that

they “profited a lot” (23%) or “a fair amount” (58%) from the group work. For example, Clara (Giessen Group 6) seemed to appreciate her newly learned knowledge despite difficulties within her cooperative group: “Although it was all a bit frustrating in the end and the group work was not well organised I profited a lot because I know next time I will apply what I have learned out of this.” Several preservice teachers also appeared to realize that it was not the final product (i.e., the website) which constituted the learning goal of the project but the communication in-between and across groups and “the process of creating.” Margot (Heidelberg Group 7) also appreciated having had the opportunity to put herself into the students’ shoes “with all the homework to be done by due date” and “the evaluations.” The following chat excerpt nicely illustrates how group members tried to make their collaboration even more challenging by opting not to include members from the same institution in their sub-groups:

**Tina:** I mean, it would be more exiting to work with [Heidelberg] on a subject  
**Tina** and more challenging  
 [...]  
**Jim:** I agree, and by the way, we should learn how to work with an email  
 partner...# [...]  
**Paul:** couldnt it be more interesting to work with a partner from [Heidelberg] or  
 [Giessen]?  
**Paul:** wouldnt  
**Carrie:** definitely  
**Tina:** yoop!  
**Paul:** two groups, one from [Giessen] and one from [Heidelberg]  
 (Chat excerpt, Group 2, May 28, 2002)

### ***5.6 Benefit six: familiarizing oneself with the literature on benefits of using technology in education***

Other preservice teachers indicated their awareness of the impact of CMC-based projects on intercultural learning (see Kinginger, Gourves-Hayward & Simpson, 1999; O’Dowd, 2003; Thorne, 2003): “It was very interesting to see what can be done with the new media in ELT and that it is a great way – both for teachers and students – to establish intercultural learning skills and opportunities on an appropriate level” (Otto, Heidelberg Group 5). Or, as Andy (Heidelberg Group 6) remarked: “The computer is and will be a medium for students to work and learn at school. It opens new doors to intercultural learning that has not been possible in the past.” By the same token, the opportunity for cross-cultural learning highlights the challenge for teachers to provide “cultural sensitization” for their learners (Belz, 2002: 76) and to help their learners develop appropriate CMC-based negotiation strategies (see Fuchs, 2006).

### ***5.7 Benefit seven: observing teacher educators, content specialists, and mentor teachers modeling innovative uses of technology to support learning***

Preservice teachers also stressed that the seminar helped them with developing and

realizing ideas for web-based tasks, thinking about the “do’s and don’t’s of an email project,” working with guidelines for evaluating websites, learning about prior CMC-based projects and experiences, developing and implementing ideas for their own classroom teaching, and with learning about how to use literature for email projects. More specifically, Tina highlighted the need for language teachers to assist learners in relating the skills acquired in a seminar like this to the professional world:

We as future teachers should realize, that these are competences that need to be taught and trained. Many companies look for competent employees that are able to work independently as well as in a team, that have a good time management and a lot of computer skills. As I understand my job as a teacher, I am to prepare my students for all these challenges (Tina, Giessen Group 2).

Having had the opportunity to observe teacher educators modeling how to teach electronic literacy skills may have helped Tina “realize” the importance of teaching such skills herself. Although the project presented preservice teachers with a great number of benefits with regard to electronic and professional literacy skills, there were also important challenges related in particular to acquiring professional literacy.

## 6 Discussion of challenges

### *6.1 Challenge one: basic understanding of how computers and related technology can be used in education*

As preservice teachers indicated prior to the start of the CMC-based collaboration, there had been only little emphasis placed on in-class computer work in their previous courses (see Section 4.1). This result seems to be in line with the claim that integrating technology into teacher education has not always been successful (see Gibson, 2002). Once the collaboration had started, preservice teachers reported problems with *FirstClass®* and Windows in their first logs. In Log Two a couple of months later, participants stressed difficulties with *FirstClass®*, with computers in general, and with CMC-based communication (see Section 4.2). Interestingly, only four preservice teachers who had filled out Log One stated that they had problems (seven out of eleven respondents stated that they had no problems), while a total of 23 listed numerous issues in their Log Two (two out of 25 respondents stated that they had no problems). It seems surprising that only a few participants reported computer problems in the beginning, i.e., at a time when they had to get used to working with the software. Yet, it turned out that most preservice teachers attributed the various problems they encountered later on to technological issues. For instance, they thought that not having been able to get in touch with their group members from the partner institution in the beginning had been due to their lack of technical know-how, or that inefficient and ineffective chats had resulted in their failure to discuss website details. These perceptions seem to be in line with another study which found that online discussions are not automatically interactive and collaborative (see Pawan, Paulus, Yalcin & Chang, 2003).

### **6.2 Challenge two: specific novice skills for integrating technology into the curriculum at the grade level and in the subject(s) preservice teachers plan to teach**

Based on their experience with this project, preservice teachers expressed concerns about having to work within the infrastructure and institutional prerequisites of the various public schools in Germany: “Usually the problems were easily solved, but it led to frustration though we are all students at the University and not pupils at a secondary school who get easily frustrated” (Margot, Heidelberg Group 7). Ida (Heidelberg, Group 5) also voiced her doubts about conducting CMC-based projects in the German *Hauptschule* (secondary school, grades five through nine): “We as students and independent learners did have to face certain problems which was okay for us but what about learners who have a quite low frustration level?” Here, Ida appears to assume that students who attend the German *Hauptschule* might not have the same level of tolerance for ambiguity<sup>2</sup> compared to university-level learners. Still, she conceded that she would be willing to conduct such a project herself in her future teaching. Ida and Margot also pointed to the challenge of accounting for the differences in learners’ levels of electronic literacy. They both expressed worries that the difficulties they had encountered in this project might be accelerated in primary or secondary schools. These are indeed valid concerns. For example, Pawan *et al.* (2003: 83) found that factors such as computer skills “may linguistically and socially affect the quality of online negotiation and students’ motivation”.

### **6.3 Challenge three: being able to frame problems and to solve problems on-the-fly**

Some examples seem to show that preservice teachers had difficulties coping with solving problems because “everybody more or less did their own thing” (Judith, Heidelberg Group 6). In addition, Marietta (Heidelberg Group 1) thought she “didn’t profit that much” because she was always wondering how to connect the work all of them did, and it seemed as if their group chats had been counter-productive: “It was difficult to meet and make up our minds and in the beginning our chats just made me feel insecure about the progress of our work.” Other critical voices expressed that they felt that their many group chats (i.e., a total of 25 chats) were “tedious and time-consuming” (Severin, Giessen Group 1) or “ineffective” (Andy, Heidelberg Group 6). One reason appeared to have been that groups had difficulty in finding a time to chat.

It appears that only few preservice teachers reflected on their learning at the meta-level by stating what kind of implications the challenges experienced could possibly have for their own language teaching. By contrast, Katja of Giessen Group 5 realized that “it was just hard to work everything out but I guess that was part of the whole

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2 According to Budner, ambiguity can be defined as “the tendency to perceive (ie., interpret) ambiguous situations as sources of threat (Budner 1962: 29). Ambiguous situations are defined as a lack of sufficient information. This lack can emerge in three contexts, such as in completely new situation in which without any familiar cues, or in a complex situation with many cues to be considered, or in a contradictory situation with different elements or cues which suggest different structures. In other words, such situations are “characterised by novelty, complexity, or insolubility” (30).

seminar to see how communication between two universities work.” Clara (Giessen Group 6) also stated that she appreciated her newly learned knowledge despite difficulties within her cooperative group.

#### **6.4 Challenge four: going beyond learning recipes for certain types of technology use or technically correct implementations of plans developed**

Another difficulty was the role of those who appeared to be the most electronically literate in the group. For instance, Genoveva appears to express her frustration and dissatisfaction with regard to not having been actively involved in the physical uploading of her group’s website because one of her team members in Heidelberg (Tim) had taken charge of publishing their final product:

[B]oth of us on the Giessen side were not happy with the way the webpage turned out, and we did not have a chance to really participate in the design. [Tim] had volunteered to do the final page, but he did not give us any chance to design some of it ourselves, and did not manage to put the pictures online properly, which was really frustrating (Genoveva, Giessen Group 6).

Her frustration was also supported by her Giessen team member Clara, who expressed that they were “quite dissatisfied with the product in general.” Interestingly, their Heidelberg partner Tim, who had been the person in charge of creating the website for the cooperative group, believed that he “didn’t profit much because nobody knew how to create a website, so it was very difficult.” This seems to indicate that preservice teachers missed out on peer teaching and learning when designing their website. Furthermore, Tim expressed a great deal of dissatisfaction upon having compared their final product with those of the other groups. This becomes evident in his comments in a chat at the end of the collaboration:

**Tim:** we’ve really “abgekackt” [“screwed up”], haven’t we?  
**Genoveva:** well... the layout yes, but the content is much more important  
**Genoveva:** so we like our content, just the layout of the others was better  
**Tim:** that’s right, but it was a bit frustrating, wasn’t it?  
**Genoveva:** me and Clara will get together next week and put some pictures in, ok?  
**Tim:** ok, hope it works, you have to put the pictures in the folder, too, and with the same name which the link has got.  
**Genoveva:** it was not that frustrating because we kind of had the notion that the outcome would look like that.  
**Tim:** yeah, but surely they laughed inside themselves.  
**Genoveva:** come on, it wasn’t that bad!  
**Genoveva:** I mean, some people here did professional pages before, so what did you expect?  
 (Chat excerpt, Group 6, July 4, 2002)

In Group 5, it turned out that one of the Heidelberg members had a business for website design. According to the Giessen members of Group 5, all they had to do was to send

Word documents to Heidelberg for their partner to use on the website. On the one hand, the members of Group 5 said it was a big relief; but on the other hand, they would have liked to exercise more control over their website and, for example, make it more colorful (Researcher Log, July 4, 2002). Nevertheless, the final product of this group turned out a “little too professional” as some of the other groups noted:

- Nadja:** do u like the website of the kiwis?  
**Margit:** The Group Five-site is pretty good – and looks very professional!  
**Margit:** A little too professional for my taste!  
**Nadja:** very professional ... I was reallly impressed, almost shocked  
**Nadja:** I agree  
 (Chat excerpt, Group 4, July 9, 2002)

These examples demonstrate that group members were concerned how their final product compared to the work by other groups. Instead, preservice teachers might as well have taken more pride in their own projects, which all turned out highly innovative and original.

## 7 Implications

As could be seen from the discussion, the challenges for preservice teachers were primarily related to professional literacy skills. For example, while most preservice teachers stated that they acquired new skills such as creating websites, using a computer conferencing program, and learning about integrating the Internet into EFL teaching, very few expressed that they had benefited from their peers with regard to improving their technology skills (in contrast see Adams, 2005; Krueger *et al.*, 2004). Does this mean that preservice teachers did not profit from their peers, or that they were not aware of it? In order for teacher educators to better foster professional growth and development, they may want to raise preservice teachers' awareness with regard to peer learning and professional development as the ultimate goals of the project collaboration. In doing so, teachers could integrate the role of the ‘technology expert’ (such as Tim in Group 6) differently into the group's work process. Such ‘experts’ could be asked to guide their peers through the part rather than creating a website alone and presenting group members with a finished product. In order to document their learning progress, preservice teachers could also provide detailed meta-level reflections on their progress in learning about and using computer technology and possible implications for their own classrooms. These reflections could then be posted for teacher educators and peers to read and serve as a springboard for in-class discussions on how to relate newly acquired professional skills to their own future teaching.

In addition, an in-class discussion of the role of CMC-based tasks could help learners become more aware that the locus of the learning does not necessarily lie in the task itself (see Belz, 2002: 75). Rather, the goal of such tasks should be for learners to discover how to cope with the contingencies of CMC-based collaboration, e.g., difficulties with the software, problem solving, joint topic negotiation, and assignment of roles and tasks in the absence of face-to-face communication.

Moreover, participants expressed a number of concerns in terms of differences in

levels of language learners' electronic literacy skills and tolerance for ambiguity which teacher educators may want to address. For instance, one way for teachers to determine their learners' prior electronic literacy could be to conduct a pre-course needs analysis similar to the pre-course questionnaires (see Section 4.1). Learners' levels of tolerance for ambiguity seem to play a role for teachers as well and could be addressed during the initial learner training phase. For instance, with respect to technology, teachers could address the different pace of email and chat which tends to slow down CMC-based communication. Teacher educators may also consider addressing school-specific infrastructures and institutional constraints of the various German public schools (e.g., computer availability and access). In sum, teacher educators should ensure that preservice teachers move beyond the level of improving their own electronic literacy skills and to the level of honing their professional skills. Ideally, preservice teachers value challenges and miscommunication encountered in projects like these and view them as unique opportunities for (peer) learning about CMC-based collaboration. Most importantly, preservice teachers reflect on how they can possibly apply their newly gained knowledge and skills to their own classrooms.

Lastly, logistical pitfalls tied to the use of technology in this collaborative project deserve to be mentioned. It appears that designing the layout for some of the groups' web-based modules was rather time-consuming which meant that less time could be spent on the content of the actual activities (see Fuchs, 2006). Here, teacher educators may need to ensure that preservice teachers do not get lost in technical details but make the pedagogical value of activities a priority. Another logistical challenge was the occasional unreliability of the server. This was problematic during the in-class chats since there was only limited time at the end of each class to talk synchronously. In order to avoid such a potential source of frustration, teacher educators could make chats voluntary, out-of-class endeavors rather than in-class requirements. Doing this may also prove helpful for CMC-based collaborations which have to bridge different time zones (for a more detailed discussion see Fuchs, 2006).

## **8 Future research**

Even though preservice teachers indicated that this project helped them improve their electronic literacy skills and learn about using technology in ELT, the design of this study did not allow for stipulating such areas of improvement. Hence, it would be interesting to explore how preservice teachers perceived the importance of using email in FLT as opposed to using chat for FLT after the project. Does chat rank higher for them after the project and if so, is this due to their newly gained familiarity with the medium? Which media (chat, email) can they imagine using for which contexts? Consequently, future studies could include a component which investigates how and in which areas preservice teachers experience a change of attitude induced by technology-based learning in their teacher education program. By the same token, in order to find out what in-service teachers actually teach in their classrooms, one will need to conduct longitudinal studies which shadow teachers in their classrooms over an extended period of time. This can help gain insight into the multiple factors, e.g., computer access and technical support, which may be responsible for similarities or differences in their teaching. For instance, Bullock's follow-up study found that in-service teachers who had



experienced the same university classes and received the same modeling and expectations from university faculty, demonstrated big differences in their practice teaching experiences despite encountering similar teaching contexts in terms of technology access, technical support, and university instruction and modeling (2004: 235). The author strongly advocates further research in this underexplored area since the results of such follow-up studies can feed back into teacher education programs.

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