Teacher Education and Technology: Strengths and Weaknesses of Two Communication Tools

Thierry Karsenti
Université de Montréal, Montréal, Canada

thierry.karsenti@umontreal.ca

Abstract

Two primary types of electronic communication tools are used in teacher education programs: synchronous and asynchronous. Each has its key strengths and weaknesses and has been documented as appropriate for a different set of circumstances. Synchronous interaction involves the parties (learners, or learner and instructor) being online at the same time and communicating in real-time whereas asynchronous interaction involves the parties communicating over elapsed time. Few studies have focused on the advantages and disadvantages of various types of asynchronous communication tools, namely forums and electronic discussion groups. Our results show that the electronic discussion group appears to bring together students teachers who, often during their practicum, feel isolated, therefore contributing to the development of a learning community. Data collected also highlight how electronic discussion groups are much more appreciated by preservice teachers than forums and are much more effective for preservice teachers who wish to become reflexive practitioners.

Keywords: asynchronous, preservice teacher, reflexive practitioner, electronic discussion groups, forum

Introduction

There are two primary types of electronic communication tools used in teacher education programs : synchronous and asynchronous. Each has its key strengths and weaknesses and has been documented as appropriate for a different set of circumstances. Synchronous interaction involves the parties (learners, or learner and instructor) being online at the same time and communicating in real-time whereas asynchronous interaction involves the parties communicating over elapsed time, not real time, usually in a typewritten format. While many studies have compared synchronous and asynchronous communication tools, few studies have focused on the advantages and disadvantages of various types of asynchronous communication tools, namely forums and electronic discussion groups.

The objective of this study is to analyze the strengths and weaknesses of forums and electronic discussion groups.

A forum is an online discussion group. It is a place in which its members can post messages on a particular site, read each others messages, and reply to messages. A forum will usually belong to a specific group, for example a forum for students of a course. It will often be designed for a specific purpose, for example a forum to discuss a course topic, a practicum, etc. Electronic discussion groups combine simple e-mail into a

'list' to which users can subscribe in order to enable a regular exchange of information on a particular subject which every subscriber can read and contribute to. The difference between a listserv and an electronic discussion group is that communication is bidirectional. In most listservs to which people subscribe, emails can be received but responses cannot be issued to the list. With electronic discussion groups, participants can subscribe and only decide to receive messages (these are called lurkers in Internet jargon), or respond if they wish to. Though in the field of teacher education this asynchronous communication tool is slow to mushroom or spread, it appears to provide a great deal of stimulation to participants of other fields such as law and technology.

Context

Information and communication technologies (ICTs), in particular synchronous and asynchronous communication tools aimed at facilitating collaboration among students and teachers, have received a lot of scrutiny in the past ten years (Bonk & King, 1998; Crook, 1994; Freeman & Bamford, 2004; Joy & Garcia, 2000). In various faculties of education, many courses make use of ICTs, though sometimes with "little or no consideration of the impact on student learning" (Wegner, Holloway, & Garton, 1999). In general, university professors and instructors use listservs, electronic mail, forums and chat rooms to communicate with their students (Buzzard, MacLeod, & DeWitt, 1997; Higher Education Research Institute, 1999; Rossman, 1999; Rovai, 2002).

Most research on the use of asynchronous communication tools such as forums and listservs or electronic discussion groups has found that they enhance learning in that they increase the possibilities for students to focus on the course content (Campos, Laferriere, & Harasim, 2001; Curtis & Lawson, 2001; Freeman & Bamford, 2004; Gerosa, 2003; O'Quinn, 2004; Weasenforth, Biesenbach-Lucas, & Meloni, 2002). The most important aspect of forums or electronic discussion groups is that they encourage asynchronous collaboration. In forums, people work together to form ideas, argue points, and solve problems. Whereas in face-to-face meetings (e.g. seminars) they must make their statements one after the other synchronously within a limited timeframe, in forums they can take their time and write their messages asynchronously when it suits them, or within a larger timeframe. Many studies have also highlighted that on-going asynchronous interactions – such as those possible in electronic discussion groups as well as forums – are preferable to "one-shot [synchronous] CMC [computer-mediated communication] groups" (Walther, 1994; Wu, 2003) in that they help participants to build a better context in which learning can take place. Asynchronous interaction involves students and teachers communicating over elapsed time, not real time. One of the greatest benefits of asynchronous interaction is its flexibility. Preservice teachers who have very different work patterns and are completing their practicum in schools can therefore communicate with their peers, university supervisor, etc. when it suits them, and information of all kinds including documents, pictures, sound and videos can be shared, not just text in discussions. For student teachers who are spread across multiple schools in various regions of the province of Quebec, research appears to show that it is an ideal delivery mode (O'Quinn, 2004). It is also more of a leveller than either face-to-face or synchronous communication such as chat rooms, as all preservice teachers have an equal opportunity to participate, from where and when they wish. In asynchronous communication, students are not relegated to the back of the class by a talkative colleague: they can participate when they want. Moreover, those who have trouble speaking up because of language differences or shyness can take their time writing a reply. Another advantage of the asynchronous environment is that the learning does not have to be geared to the average student. Those who wish to research a subject in more depth can do so in their own time, and those who are slower learners can review material a number of times. Technically, access to asynchronous environments can often be made with a lower hardware and network specification, which is of use to remote participants.

The context of a lengthier practicum does not promote exchange among student teachers who are placed in different locations. And even when in the same school, conditions favoring professional exchanges are not often met: availability in terms of time and place, promotion of such exchanges by supervising teachers, etc. (McIntyre, Byrd, & Foxx, 1996). Seminars bringing together student teachers and supervisors have been implemented but are infrequent as they required student teachers to travel and make time in their schedule when they are already overwhelmed by planning, correction, etc.

In many teacher education programs in Canada, forums seem to have taken the lead among asynchronous communication tools. Also, many believe that forums, as they allow for thought and reflection on a given subject would help preservice teachers become reflexive practitioners (Schon, 1983, 1987). The notion of reflection-in-action, and the Reflective practitioner, very popular in Canada were first posited by Donald Schon in *The Reflective Practitioner* (1983). Schon described how reflection-in-action could be used by professionals as a tool to improve their practice. Schon later noted that it is possible to describe the tacit knowledge implicit in our actions through a process of observation and reflection (Schon, 1987, p.26). Schon's concept of reflection-in-action has attracted a great deal of attention across several disciplines, and particularly in teacher education programs in Canada. In past years, many teacher educators believed that asynchronous communication tools such as forums could help preservice teachers develop their ability to reflect on their practice, as they have more time to reflect on and produce their contributions.

Benefits of asynchronous communication tools also consist of opportunities to address a diverse set of topics in more depth than can be done in class or in a synchronous environment, thus allowing student teachers to conceptualize a topic from multiple viewpoints and to contribute to each other's understanding (Johnson & Johnson, 1996; Kirkley, Savery, & Grabner-Hagen, 1998; Weasenforth, Meloni, & Biesenbach-Lucas, 2005). Learners actively construct their own learning by engaging themselves and others in reflective explorations of ideas, drawing conclusions based on their explorations and synthesizing those conclusions with previous knowledge in what is most often a non-linear process (Weasenforth, Meloni, & Biesenbach-Lucas, 2005). In this process of learning, students are engaged in more inductive, problem-solving activities as opposed to deductive, analytic teacher-based exercises and lectures (Nunan, 1999), and instructors may prompt students' engagement by providing open-ended questions and problems that require discussion and collaborative work to answer/solve (Grabe & Grabe, 1998). Computer-mediated technology also provides tools that are useful in promoting collaborative learning activities (Johnson & Johnson, 1996; Warschauer, 1996) that can "mediate communication between learners" (Peraya & Larose, 2001).

Method

Subjects

A total of 1723 preservice teachers (1464 females and 259 males) enrolled in a four-year teacher education program were selected to participate. Subjects had a mean age of 21 years old.

Measures and Analyses

Participants were divided in two groups: one using forums and one using other electronic discussion groups. Messages sent in both the electronic discussion group and the forum were analyzed in order to better understand the strengths and weaknesses of each communication means. A questionnaire was administered to 800 of participating student teachers (682 females and 118 males). Various questions were asked to student teachers in order to better understand both the

advantages and disadvantages of each asynchronous communication tool. Data was analyzed using FilemakerPro 7© through a grounded theory approach, or more precisely through a process called ethnographic content analysis (Altheide & Johnson, 1994). This type of content analysis uses many of the traditional content analysis procedures (e.g. Huberman & Miles, 1994), but also the back-and-constant comparison that grounded theory applies (Tesch, 1990). Within this general qualitative analysis framework, data analysis for all the data collected involved generating concepts through the process of coding which "represents the operations by which data are broken down, conceptualized, and put back together in new ways. It is the central process by which theories are built from data." (Strauss & Corbin, 1990, p. 57.). Our coding of all the data consisted of three phases: induction (reading all the data so that concepts or codes could emerge), deduction (we coded all the data and had to label each segment) and verification (all coded data was verified). We first opted for an analytical induction technique (e.g. Strauss & Corbin, 1990) to derive coding concepts from the data. Finally, the reiterative verification of coding enabled further adjustments and refinements of the concepts. The process was continued until we reached a point where no additional coding of the data contravened the refined concepts.

Presentation and Analysis of Results

In this section, we briefly outline some of the results that will be presented. First, it is important to highlight that only 3% of participating preservice teachers claimed not to have liked electronic discussion groups, in contrast with 50% of students who did use forums. The principal flaw of forums seems to be the number of unanswered questions posted, as well as the limited amount of messages sent. In forums, future teachers must first find the site, then search through the various questions posted in order to choose one to which they wish to reply. This is not something that is done spontaneously during field practice, when one is already so busy. We also note that the electronic discussion group – in which no one complained of unanswered questions – generated a higher number and a greater frequency of exchanges. Thus, according to the student teachers, a question posed in the evening always received a response by morning. The speed of responses seems to have been greatly appreciated by student teachers who look for quick replies to their questions during the practicum.

The analysis of the responses given by student teachers in the questionnaire shows that, generally, the electronic discussion group seems appreciated for both professional and personal reasons. The support and encouragement offered are mentioned as the main advantages of this type of contact. As all student teachers experience comparable problems, all subject areas included, advice or suggestions stemming from one individual's experience can indeed help another student-teacher in a similar context. These exchanges can also be quite comforting during more challenging moments when one finds oneself suddenly more alone in a place where it is not always possible to discuss problems with staff members. In this sense, electronic exchange helps to counter the isolation which can be felt by student teachers during their practicum.

The electronic discussion group also has its place in teacher training in that it gives student teachers the opportunity to learn from others' experiences by raising questions and promoting discussion with regard to concrete cases and by stimulating constant reflection from participants. The student teachers exchanges ideas, advice, approaches, but also comments on students, school context and the profession in general. They ask questions « aloud » and receive various responses that comfort them, help them find solutions and encourage them to reflect.

Messages sent in both the electronic discussion group and the forum were analyzed in order to better understand the strengths and weaknesses of each communication means (detailed results to be presented at the conference). Though data collected highlights that electronic discussion groups are much more appreciated than forums, it appears important to note that they do not necessarily replace face-to-face seminars taking place occasionally during the practicum. This asyn-

chronous communication tool appears to be greatly appreciated for its flexibility. Preservice teachers who have very different work patterns and are completing their practicum in different schools can therefore communicate with their peers, the university supervisor, etc. when it suits them, and information of all kinds and attachments can be easily shared.

Discussion

The electronic discussion group appears to bring together students teachers who, often during their practicum, feel isolated, therefore contributing to the development of a learning community (Wenger, 1998). Various studies conducted with preservice teachers since we implemented the electronic discussion group during their practicum highlight their great appreciation of this asynchronous communication tool. Student teachers enjoy communicating with their peers, sharing experiences, helping each other during difficult times, finding solutions to teaching challenges, etc. Without the discussions, exchanges and reflections taking place with the electronic discussion group, preservice teachers would have a much more difficult time becoming reflective practitioners. Finally, data collected highlight how electronic discussion groups are much more appreciated by preservice teachers than forums. Results obtained also suggest that electronic discussion groups are much more effective for preservice teachers who wish to become reflexive practitioners.

References

Altheide, D. L., & Johnson, J. M. (1994). Criteria for assessing interpretive validity in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 485-499). London, UK: Sage.

Bonk, C. J., & King, K. (Eds.) (1998). *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse*. Mahwah, NJ: Lawrence Erlbaum.

Buzzard, J., MacLeod, L., & DeWitt, C. W. (1997). Enhancing student learning through electronic communication. Retrieved from http://www.mtsu.edu/~itconf/proceed97/buzzard.html

Campos, M., Laferriere, T., & Harasim, L. (2001). The post-secondary networked classroom: Renewal of teaching practices and social interaction. *Journal of Asynchronous Learning Networks, 5*(2), 36-52.

Crook, C. (1994). *Computers and the collaborative experience of learning*. New York, NY: Routledge.

Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks, 5*(1), 21-34.

Freeman, M., & Bamford, A. (2004). Student choice of anonymity for learner identity in online learning discussion forums. *International Journal on E-Learning. 3*(3), 45-53.

Gerosa, M. (2003). Analysis and design of awareness elements in collaborative digital environments: A case study in the AulaNet learning environment. *Journal of Interactive Learning Research, 14*(3), 315-332.

Grabe, M., & Grabe C. (1998). *Integrating technology for meaningful learning.* New York, NY: Houghton Mifflin.

Higher Education Research Institute. (1999). *An overview of the 1998-99 faculty norms*. UCLA Graduate School of Education and Information Studies. Retrieved from http://www.gseis.ucla.edu/heri/fac_po.html

Huberman, A. M., & Miles, M. (1994). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 428-444). London, UK: Sage.

Johnson, D. W., & Johnson, R. T. (1996). Cooperation and the use of technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 1017-1044). New York, NY: Simon & Schuster.

Joy, E. H., & Garcia, F. E. (2000). Measuring learning effectiveness: A new look at no- significant-difference findings. *Journal of Asynchronous Learning Networks, 4*(1), 33-39.

Kirkley, S. E., Savery, J. R., & Grabner-Hagen, M. M. (1998). Electronic teaching: Extending classroom dialogue and assistance through e-mail communication. In C. Bonk & K. King (Eds.), *Electronic collaborators* (pp. 209-232). Mahwah, NJ: Lawrence Erlbaum.

Peraya, D., & Larose, F. (2001). Fondements épistémologiques et spécificité pédagogique du recours aux environnements virtuels en pédagogie universitaire: Médiation ou médiatisation. In T. Karsenti & F. Larose (Eds.), *Les TIC … Au cœur de la pédagogie universitaire* (pp. 31-68). Sainte Foy, QC : Presses de l'Université du Québec.

McIntyre, D. J., Byrd, D. M., & Foxx, S. M. (1996). Field and laboratory experiences. In J. Sikula, T. J. Buttery & E. Guyton (Eds.), *Handbook of research on teacher education* (2nd ed.) (pp. 514-534). New York, NY: Macmillan.

Nunan, D. (1999). *Second language teaching and learning*. Boston, MA: Heinle and Heinle.

O'Quinn, L. (2004). Factors which motivate community college faculty to participate in distance education. *International Journal on E-Learning, 3*(1), 19-30.

Rossman, M. H. (1999). Successful online teaching using an asynchronous learner discussion forum. *Journal of Asynchronous Learning Networks, 3*(2), 1-8.

Rovai, A. A. (2002). A preliminary look at the structural differences of higher education classroom communities in traditional ALN courses. *Journal of Asynchronous Learning Networks, 6*(2), 41- 56.

Schon, D. (1983). *The reflective practitioner*. New York, NY: Basic Books.

Schon, D. (1987). *Educating the reflexive practitioner*. San Francisco, CA: Jossey-Bass.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tesch, R. (1990). *Qualitative research*. New York, NY: The Falmer Press.

Walther, J. B. (1994). Anticipated ongoing interaction versus channel effects on relational communication in computer-mediated interaction. *Human Communication Research, 20*(4), 473-501.

Warschauer, M. (1996). *Computer-mediated collaborative learning: Theory and practice*. Research Note #17. Honolulu: University of Hawaii, Second Language Teaching & Curriculum Center.

Weasenforth, D., Biesenbach-Lucas, S, & Meloni, C. (2002). Realizing constructivist objectives through collaborative technologies: Threaded discussions. *Language Learning & Technology, Special Issue, 6*(3), 58-86.

Weasenforth, D., Meloni, C. & Biesenbach-Lucas, S. (2005). Learner autonomy and course management software. In B. Holmberg, et al. (Eds.), *Distance education and languages: Evolution and change* (pp. 195-211). Clevedon, UK: Multilingual Matters.

Wegner, S. B., Holloway, K. C., & Garton, E. M. (1999). The effects of Internet based instruction on student learning. *Journal of Asynchronous Learning Networks, 3*(2), 98-106.

Wenger, E. (1998). *Communities of practice. Learning, meaning and identity*. New York, NY: Cambridge University Press.

Wu, A. (2003). Supporting electronic discourse: Principles of design from a social constructivist perspective. *Journal of Interactive Learning Research, 14*(2), 167-184.

Biography

Thierry Karsenti, M.A., M.Ed., Ph.D., holds the Canada Research Chair on information and communication technologies (ICTs) in education. He is also a professor at the Université de Montréal, in the field of information and communication technologies and their integration in teacher training and education.

His technopedagogical achievements and innovations have been recognized at both the provincial and national levels. He was awarded first place in the Prix du ministre de l'Éducation contest (1998-1999 and 1999-2000), and along with a team from Université du Québec, received the Prix Hommage 2001 from the Quebec government. As well, he was awarded the Prix d'Excellence en Conception Pédagogique by the Canadian Association of Distance Education (2000) and the Prix PEDAGOGICA-RESCOL for pedagogical innovation in the integration of ICTs (2000). In October 2000, he won the Prix quinquennal d'Excellence en enseignement. He has also been recognized for his contributions, through research activities, to the quality of pedagogy. His research interests center upon the pedagogical integration of new technologies, teaching practices and motivation.