

The influence of instructional methods on the quality of online discussion

Heather Kanuka, Liam Rourke and Elaine Laflamme

Heather Kanuka is a Canada Research Chair and Associate Professor at Athabasca University, Canada. Liam Rourke is a researcher at the National Institute of Education, Singapore. Elaine Laflamme is a doctoral student at McGill University, Canada. Addresses for correspondence: Heather Kanuka, Athabasca University, Edmonton Learning Centre, Peace Hills Trust Tower 1200, 10011-109 Street, Edmonton AB T5 J 3S8, Canada. Telephone: (780) 428-7278; fax: (780) 497-3416; email: heatherk@athabascau.ca. Liam Rourke, National Institute of Education, Singapore. Email: rourkel@nie.edu.sg. Elaine Laflamme, McGill University, Canada. Email: elaine.laflamme@mcgill.ca

Abstract

In this case study, we examined the influence of five groups of communication activities on the quality of students' contributions to online discussion. The activities were the nominal group technique, debate, invited expert, WebQuest and reflective deliberation. Quality of discussion was operationalised as *cognitive presence*, a construct developed to investigate the role of critical discourse in higher, distance education contexts. Using the quantitative content analysis technique, the postings of 19 students in an undergraduate university course were assigned to one of the four categories of cognitive presence. Across the five activities, the proportion and number of contributions categorised in the highest phases of cognitive presence was low (20.21%), but was highest during the Webquest and debate activities. There are three advantageous qualities of these two activities, we argue:

1. They were well structured.
2. They provided clearly defined roles and responsibilities for the students.
3. They provoked the students to explicitly confront others' opinions.

Introduction

Traditionally, distance education involves learning and teaching contexts in which the instructor is separated from the student (Keegan, 1990). The most obvious aspects of the separation—spatial and temporal—give rise to other, perhaps more detrimental separations including social, cultural, situational and psychological. In an influential paper, Moore (1991) referred to these collectively as the *transactional distance* and in subsequent decades distance educators have sought ways to reduce the transactional distance so that learning could be enhanced (eg, Kanuka, Collett & Caswell, 2002).

Early research on these efforts was encouraging. Under some circumstances, communication technologies were used to bridge transactional distances with corresponding improvements in achievement, satisfaction and retention rates (Chen & Willits, 1999; Saba & Shearer, 1994). Unfortunately, the technologies available to distance educators at the time (eg, two-way audio conferencing, room-based video conferencing) were expensive, complex and unreliable, and they diminished the possibilities of 'anytime, anywhere' learning that attracted many students to distance learning environments (Bates, 2005).

With the emergence of internet communication technologies, it became apparent that these shortcomings might be overcome. Studies on learning effectiveness and internet communication technologies continued with renewed zeal. Unfortunately, research has yet to reveal an unequivocal relationship between text-based, asynchronous internet communication technologies and an enhanced distance learning experience (Bernard *et al.*, 2004).

Addressing this problem, theorists have identified the following potential difficulties:

1. The models that guide research on the role of information and communication technologies in higher, distance education are inadequate (eg, Garrison, Anderson & Archer, 2000).
2. The facilitation of learning activities that are based on mediated group communication is ineffective (eg, Salmon, 2000).
3. The learning activities that are incorporated in these situations are inappropriate or ill-defined (eg, Marra, Moore & Klimczak, 2004). In this study, we focus on the latter issue.

The purpose of this study was to explore the relative influence of five distinct, well-established instructional methods on the quality of students' online discussions. Each method encompasses a well-defined learning activity on the basis of peer and instructor communication. Each is examined for its ability to promote reflective thinking and critical discourse, which should be evident in the students' contributions to their online discussions.

Literature review

Instructional methods

Instructional methods are deliberate and planned goal-orientated pedagogical activities where learning outcomes and the teacher's and students' roles and activities are clearly defined and described. In a seminal paper, Clark (1984) argues that instructional methods are necessary when students cannot (or will not) provide learning strategies for themselves. Clark further argues that there is a need to attribute any kind of learning gains to instructional methods—as this is the active ingredient in instruction, not the delivery medium. Williams (2002) suggests that students who use active and diverse learning strategies are more likely to acquire sophisticated levels of understanding than those who do not. We assert further that it is planned instructional methods that define

formal education and allow for distinctions between serendipitous 'web surfing' and distance education.

Several instructional methods have been developed specifically for the purpose of moving learners from low levels of learning (eg, rote learning or memorisation of facts) to higher levels of learning (eg, understanding complex and abstract phenomenon through critical and creative thinking). Many of these instructional methods revolve around some form of peer and instructor communication. Tenenbaum, Naidu, Jegede and Austin (2001) suggest that the following communicative activities can help students achieve higher thinking patterns: 1) arguments, discussions and debates; 2) conceptual conflicts and dilemmas; 3) sharing ideas with others; 4) materials and measures targeted towards solutions; 5) reflections and concept investigation; 6) meeting student needs and 7) making meaningful, real-life examples. Several well-established instructional methods contain these types of activities including the nominal group technique, debates, invited expert, WebQuest and deliberative inquiries.

The nominal group technique

The nominal group technique is a learner-centred and democratic decision-building process that facilitates problem solving in a large group setting (Seaman & Fellenz, 1989). Because it demands closure, it is effective at facilitating decision-building skills (Korhonen, 1991). The process begins with the presentation of a well-formed problem posed to students who are then asked to generate and prioritise their ideas about a solution. Students publicly list ideas until all suggestions have been exhausted. The course instructor then asks those students with extreme views to reconsider their responses. It is assumed that this kind of questioning and response presentation prompts the students to reflect on issues they might have disregarded as insignificant. Although research has shown that this method is as effective online as face-to-face with respect to the technical and socioemotional aspects (Hiltz & Turoff, 1978; Mauling, 2002), other research has shown that students tend to express low satisfaction (Kanuka, 2005) and reduced confidence (Danielson & Mitchell, 1995).

Debate

The debate is a structured group discussion that forces students to consider not only the facts of a situation but also the implications (Renner, 1999). The formal debate has a recognised set of rules and traditional procedures beginning with a presentation by two groups with opposing positions, followed by rebuttals from each group that both defend their own position and attack the position of the opposing team. Teachers have traditionally used the formal debate to enhance their students' confidence and ability to express viewpoints, as well as to help them develop coherent organisation and precise expression of ideas (Kanuka & Kreber, 1999). In terms of the online classroom, research literature has shown that a debate can be effectively facilitated using text-based internet communication tools and achieve its intended aims and goals (Jugdev, Markowski & Mengel, 2004; Pilkington & Walker, 2003).

Invited expert

The primary aim of inviting an expert is to help students make real-world connections with the course content. Outside experts can contribute timely information and can share relevant experiences in ways that make the course content authentic (Renner, 1999). An appealing aspect of an invited expert in the online classroom is the ability of internet conferencing tools to gain access to experts who might be inaccessible through other forms of communication. Research on inviting an expert has shown that while it translates well to the online classroom and students express satisfaction, this method may have limited effectiveness in terms of facilitating high levels of understanding (Kanuka, 2005).

WebQuest

WebQuests, originally inspired by Bernie Dodge (1995), are a unique web-based inquiry activity in which information that the students use comes from resources on the Internet. These resources will have been carefully selected by the instructor for both credibility and inclusion of diverse perspectives on the topic being investigated. Most often, these resources are put on a web page as hypertext links for ease of access. WebQuests have six critical attributes that include an introduction to a complex problem, engaging tasks (doable and interesting), a description of the process, multiple online sources and perspectives, followed by evaluation and conclusions. WebQuests often also require a form of role play as an aspect of the tasks required of the students. Research on WebQuests has shown, with surprising consistency, that they are effective both in terms of student satisfaction and achieving high levels of learning (McGlinn & McGlinn, 2003; Thomas, 1998).

Reflective deliberation

Reflective deliberation is characterised by thoughtful mediation or contemplation that uses the powers of the mind to conceive ideas and/or draw inferences resulting in the expression of carefully considered thought expressed through critical dialogue. Reflective deliberation provides the opportunity for students to reflect on the abstracted material presented in academic settings and to make it relevant to their own worlds (Laurillard, 2002). Garrison (2003) asserts that the asynchronous and written communication within online learning environments provide the conditions that 'encourage, if not require, reflection. In addition to the time to reflect, the permanent and precise nature of written communication also allows if not requires reflection to interpret and construct meaning' (p. 4). Research on the effectiveness of reflective deliberation has been inconsistent and conflicting with some research showing impressive results (Passman & McKnight, 2002), some showing undesirable results (Thomas, 2002) and others showing it is effective under certain conditions (Gorsky, Caspi & Tuvi-Arad, 2004).

Theoretical framework

Garrison, Anderson and Archer's (2001) theoretical model of practical inquiry was used as a framework to guide the study and to assess the quality of students' contribu-

tions to online discussion. The practical inquiry model asserts that there are four phases of cognitive presence (see Table 1) throughout which students collaboratively (1) become aware of a problem, (2) explore its salient aspects, (3) integrate each others' interpretations and (4) resolve the initial dilemma.

We selected the practical inquiry model because it was developed specifically to conceptualise the role of mediated communication in higher, distance education contexts. Further, the model is accompanied by a rubric for assessing critical thinking as it manifests itself in students' online discussions. In Garrison *et al's* (2000) terminology, this manifestation is referred to as *cognitive presence*, which they define as 'the extent to

Table 1: *Cognitive presence*

<i>Phases of cognitive presence</i>	<i>Description and evidence of process</i>
Phase 1: Triggering event	<p>Student activities begin with a triggering event (Phase 1) followed by problem definition (Phase 2).</p> <p>There is evidence of directed and purposeful thinking, with a focus on the problem that is introduced as the triggering event.</p> <p>There is evidence of learners defining and redefining the problem presented.</p> <p>A critical spirit and intellectual autonomy is present, whereby learners critically assess the issues explored and are open to alternative explanations.</p>
Phase 2: Exploration	<p>There is evidence that learners are searching for explanations of the problem presented and are exploring relevant ideas.</p> <p>In addition to a critical attitude and expansive thinking, learners are divergently seeking for solutions; this is important in the development of critical thinking and problem solving, as ideas organise and make sense of contingent facts.</p>
Phase 3: Integration	<p>There is evidence of a conceptualisation of the problem presented.</p> <p>Thinking is reflective and private, although reflection is socially shared with evidence of the individual tentatively making sense of the information that emerged during the exploratory phase.</p> <p>There is evidence of judgements and decisions being made and focussed on an idea or emerging hypothesis.</p>
Phase 4: Resolution	<p>The idea or hypothesis is tested. The testing begins with an initial process of sharing the idea or hypothesis with peers who, in turn, provide insights.</p> <p>Learners become ready to act upon their understanding; if there is confirmation of the problem solution for resolution, understanding will result.</p> <p>An unsatisfactory resolution will trigger a renewed search and the process will begin anew.</p>

which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry' (p. 11).

Methodology

In this study, we followed the case study research design as described by Creswell (1998)—though we modified the traditional structure by using a quantitative content analysis (QCA). What marks this investigation as a case study is that we identified a specific course for the case study, the course was bounded by place and time, and we used multiple data sources.

Context: the course and participants

A 4th year university course with 19 students enrolled was selected for this study. The course was an optional bachelor of education course within an outreach programme, cohort based and distance delivered using the WebCT learning management system. The course instructor was experienced in both distance delivery and in the use of asynchronous text-based internet conferencing software. There was no face-to-face contact between and among the students and the instructor.

Before the course began, we developed instructional activities for the online discussion component of the course that were consistent with the five instructional methods discussed earlier (WebQuest, debate, nominal group technique, reflective deliberation and invited expert). For each method, we devised clear role definitions and responsibilities for the instructor and the students, rubrics for student assessment and specific learning outcomes. Note that while the instructional methods selected for this study have specific learning activities aimed at facilitating certain learning outcomes, these methods all have a common aim to help students achieve higher thinking patterns and, therefore, we argue that the learning outcomes for each instructional method should not impact the findings in this study. Possibly, though, prior experience by both the students and instructor with each of these instructional methods may have an impact on the findings.

Data collection and analysis

Along with their rubric for assessing the processes and outcomes of online discussion (Table 1) Garrison *et al* (2000) suggest a complimentary research technique—QCA. The technique was originally defined by Berelson (1954) as the systematic, objective and quantitative description of the manifest content of communication. Abstracting the salient steps, Garrison *et al* describe it as a procedure that involves (1) segmenting conference transcripts into meaningful units, (2) classifying the units into one of the four phases of cognitive presence and (3) summing the frequency of units in each phase.

We selected the message as our unit of analysis. We then hired two graduate students to segment and classify the content of the conference transcripts. Using multiple coders permitted the determination of interrater reliability, which reflects the assumptions of QCA that communication content is manifest (not projective) and that the data analysis procedure is objective (not interpretive). A coding scheme with categories based on the

practical inquiry model was established collaboratively among the researchers and coders. The scheme was then piloted on representative samples from the WebCT fora prior to data collection and analysis.

We also asked the coders to document their experiences in a reflective journal. We asked them to record their impressions of two things: (1) the data analysis process and (2) the communicative processes and learning outcomes that they were observing and analyzing. Once a week, we met with the coders to discuss their journal entries. Our discussions were audiotaped, transcribed and analysed using the techniques associated with grounded theory (Strauss & Corbin, 1994).

Results

QCA

Throughout the 13 weeks, the students contributed 1014 messages to their online discussions. Each message was categorised by both coders. Coders achieved an aggregate interreliability, determined using Cohen's kappa, of $k = 0.57$. This figure is slightly below a kappa of 0.61, which Kvalseth (1989) and Landis and Koch (1977) characterise as reasonably good overall agreement. Because kappa is recognised as a conservative measure of reliability, we argue that the data are interpretable.

Within the total set of messages, our coders determined that 56.41% contained signs of the processes associated with at least one of the four phases of cognitive presence. Aggregating the messages that were posted during all five instructional methods, we classified the highest frequency (52%) in the second phase of cognitive presence (*exploration*). As Figure 1 shows, few messages (9.8%) reached phase four (resolution).

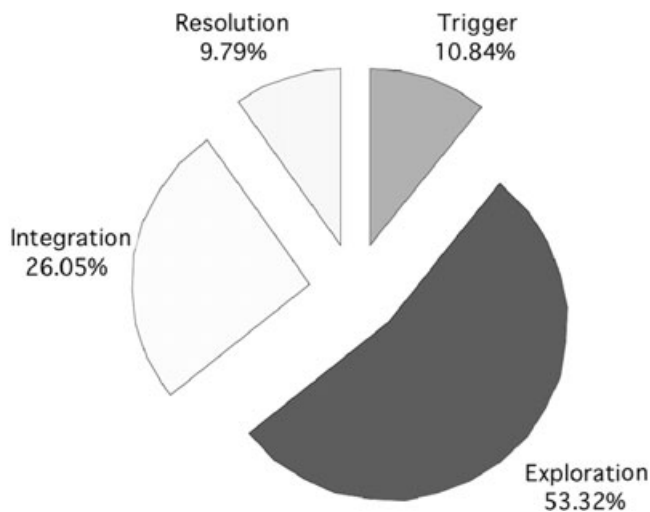


Figure 1: Percentage of phases

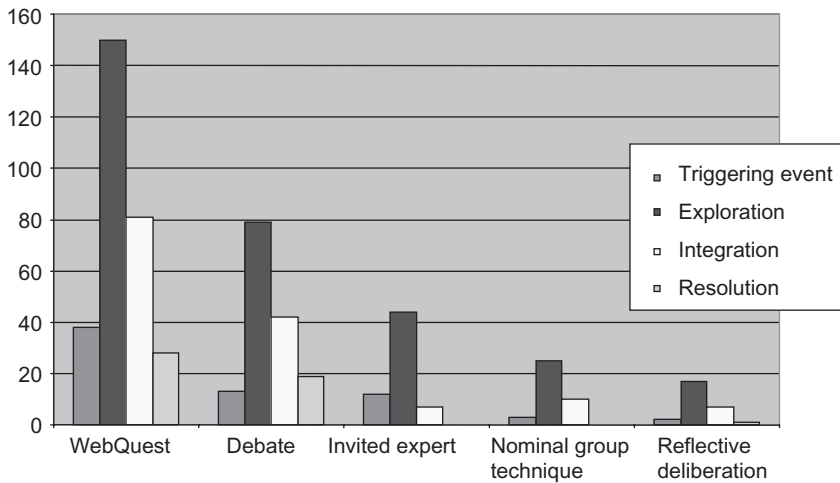


Figure 2: Frequency of cognitive presence by instructional method

Across instructional methods, we found that the mode for the four phases of cognitive presence was highest during the WebQuest and debate activities (see Figure 2).

Coders' reflective journals and debriefing analysis

The coders were asked to document their experiences in a reflective journal for the communicative experiences and learning outcomes they were observing and analyzing. An observation made by the coders was that, while the instructional methods presented an environment for active and engaged learning, the engagement they observed was not reflective. Specifically, while the course participants completed the required activities and shared explanations with their peers, they rarely went further than what was required in responding to differences of others' opinions, justifying their own opinion when challenged and working towards resolution of the problems presented. Responding to the claim that text-based asynchronous distance learning provides students with the time to critically reflect, the coders asserted further that there was little evidence of the students actually taking the time to do so. Rather, both coders noted that the asynchronous time shifting resulted in desiccated discussions, and in the words of one coder, 'communication lacking in joy, passion, flavor and urgency, and somewhat solipsistic, lacking in impulsive and spontaneous pressures.'

The coders also observed postings by many of the students espousing the need for collaborative learning and the desire to develop higher levels of learning by accepting greater responsibility and embracing a learner-centred approach. However, the coders also noted that many of the course participants failed to understand the commitment required to their group, the increased responsibility required with learner-centred approaches, and the hard work and time required to achieve higher levels of understanding.

Finally, the coders also sensed that individual peer attachments appeared easily formed and easily broken—lacking in trust, support and conflict resolution. The result was a communication fora that, as one coder stated, ‘sometimes resembled a document delivery system, rather than an engaging and caring learning community.’

When asked for observations on what they perceived as the benefits or gains of an online education, both coders agreed that what was gained with asynchronicity (eg, convenience of learning ‘anytime/anywhere’) was not matched by what was lost.

Discussion

Our results suggest that instructional methods influence the quality of students’ contributions to online discussion. We found that when students engaged in the WebQuest and debate activities, they posted a higher proportion and number of messages reflective of the highest levels of cognitive presence than when they engaged in the nominal group technique, reflective inquiry and the invited expert activities.

More so than the other activities, the WebQuest and the debate required students to actively challenge, argue, debate and aggressively confront conceptual conflicts and assumptions of their own as well as their peers. In contrast, the invited expert, deliberative inquiry and the nominal group technique are instructional methods that are less confrontational and require less argument formation and argument advancement; they are also less structured in terms of explicitly described activities. The invited expert, deliberative inquiry and the nominal group technique also do not require students to take and defend a position or assume a role; alternatively, the debate forced students to take polarised positions, and the WebQuest assigned distinct and diverse positions in the form of role playing.

This is an important finding; however, it may conceal a less encouraging aspect of our results. On the whole, the levels of cognitive presence were low. Only half of all students’ contributions during all five activities were identified as containing any elements of cognitive presence. Of these, most were categorised as exploration, which is only the second of four phases of cognitive presence. Garrison *et al* (2000) characterise exploration as an early phase in which students engage in the generative, divergent process of brainstorming. As scholarship on group process suggests, it is important during this part of the problem solving stage to be non-judgemental; consequently, the brainstorming process can be hampered by critique. Thus, even though exploration is an important phase, inherently, it does not represent critical thinking, but rather is antecedent to these types of higher levels of understanding. Our results are not unique; in fact, many researchers who have observed and analysed the content of online discussions categorise the bulk of student contributions as exploration (see, eg, Fahy, 2002; Garrison *et al*, 2001; McKlin, Harmon, Evans & Jones, 2002).

Prior research, as well as our findings, may help explain why student messages tend to aggregate in the exploration phase. Our results, for example, reveal that highly structured, planned, confrontational and demanding activities that include directed roles

and responsibilities for the students' contributions in the online classroom are key elements to moving students to higher levels of understanding and critical discourse. Prior research has also found similar findings. Pawan, Paulus, Yalcin & Chang (2003; see also Aviv, Erlich, Ravid & Aviv, 2003), for example, found that 'without instructors' explicit guidance and "teaching presence", students were found to engage primarily in "serial monologues". They further conclude, in agreement with our coder observations, that discussions 'do not automatically become interactive and collaborative simply by virtue of being conducted in anytime/anywhere asynchronous medium. Discussions tend to explore the issues in an interesting way, but without integration or resolution... [with] no evidence of challenging ideas'. Further research investigating the role of well-structured learning activities, clearly defined responsibilities for students and teachers, and confrontational discussion models would be promising directions for future studies.

Conclusions

The results of this study have shed light on certain pedagogical paradigms that may contribute to higher levels of learning. In particular, given that the highest levels of cognitive presence were in the WebQuest and debate activities, we conclude that there are three advantageous qualities that are more apparent with these instructional methods than the other instructional methods investigated:

1. They are well structured.
2. They provide clearly defined roles and responsibilities for the students.
3. They provoke the students to explicitly confront others' opinions.

References

- Aviv, R., Erlich, Z., Ravid, G. & Aviv, G. (2003). Network analysis of knowledge construction in asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 7, 3, 1–13.
- Bates, A. W. (2005). *Technology, e-learning and distance education* (2nd ed.). New York: Routledge Falmer Studies in Distance Education.
- Berelson (1954). Content analysis. In G. Lindzey (Ed.), *The handbook of social psychology: theory and method* Vol. 1 (p. 488–522). Cambridge, MA: Addison-Wesley.
- Bernard, R. M., Abrami, P. C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L. et al (2004). How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research*, 74, 3, 379–439.
- Chen, Y-J. & Willits, F. K. (1999). Dimensions of educational transactions in a videoconferencing learning environment. *The American Journal of Distance Education*, 13, 1, 45–59.
- Clark, R. E. (1984). Media will never influence learning. *Educational Technology Research and Development*, 42, 2, 21–30.
- Creswell, J. (1998). *Qualitative inquiry and research design. Choosing among five traditions*. London: Sage Publications.
- Danielson, M. A. & Mitchell, N. (1995). *Creative problem solving: a comparison of techniques*. (ERIC Document Reproduction Service No. ED386776).
- Dodge, B. (1995). *Some thoughts about Webquests*. Retrieved January 5, 2004, from http://edWeb.sdsu.edu/courses/edtec596/about_Webquests.html
- Fahy, P. (2002). Assessing critical thinking processes in a computer conference. Unpublished paper. Retrieved August 13, 2005, from <http://cde.athabascau.ca/softeval/sources.htm>
- Garrison, D. R. (2003). Cognitive presence for effective asynchronous online learning: the role of reflective inquiry, self-direction and metacognition. In J. Bourne & J. C. Moore (Eds), *Elements*

- of quality online education: practice and direction* Vol. 4, Sloan C Series (pp. 47–59). Needham, MA: The Sloan Consortium.
- Garrison, D. R., Anderson, T. & Archer, W. (2000). Critical inquiry in a text-based environment: computer conferencing in higher education. *The Internet and Higher Education*, 2, 2–3, 1–19.
- Garrison, D. R., Anderson, T. & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *The American Journal of Distance Education*, 15, 1, 7–23.
- Gorsky, P., Caspi, A. & Tuvi-Arad, I. (2004). Use of instructional dialogue by university students in a distance education chemistry course. *Journal of Distance Education*, 19, 1, 1–19.
- Hiltz, S. R. & Turoff, M. (1978). *The network nation: human communication via computer*. London: Addison-Wesley Publishing Company.
- Jugdev, K., Markowski, C. & Mengel, T. (2004, October). Using the debate as a teaching tool in the online classroom. *Online Classroom*. Retrieved August 5, 2005, from http://www.magnapubs.com/pub/magnapubs_oc/4_10/news/596758-1.html
- Kanuka, H. (2005). An exploration into facilitating higher levels of learning in a text-based Internet learning environment using diverse instructional strategies. *Journal of Computer Mediated Communication*, 10, 3. Retrieved August 5, 2005, from <http://jcmc.indiana.edu/vol10/issue3/kanuka.html>
- Kanuka, H. & Kreber, C. (1999). *Knowledge construction in the virtual classroom. Proceedings of the Canadian Association for the Study of Adult Education*, June, 1999, Sherbrooke, Quebec.
- Kanuka, H., Collett, D. & Caswell, C. (2002). University instructor perceptions of the use of asynchronous text-based discussion in distance courses. *The American Journal of Distance Education*, 16, 3, 151–167.
- Keegan, D. (1990). *Foundations of distance education* (2nd ed.). London: Routledge.
- Korhonen, L. J. (1991). Nominal group technique. In M. W. Galbraith (Ed.), *Adult learning methods* (pp. 247–269). Malabar, FL: Krieger Publishing Company.
- Kvalseth, T. O. (1989). Note on Cohen's kappa. *Psychological Reports*, 65, 223–226.
- Landis, J. R. & Koch, G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159–174.
- Laurillard, D. (2002). *Rethinking university teaching*. London: Routledge Falmer.
- Marra, R. M., Moore, J. L. & Klimczak, A. K. (2004). Content analysis of online discussion forums: a comparative analysis of protocols. *Educational Technology Research and Development*, 52, 2, 23–40.
- Mauling, W. S. (2002). *Modification of the nominal group activity for on-line instruction*. (ERIC Document Reproduction Service No. ED477452).
- McGlinn, J. E. & McGlinn, J. M. (2003). *Motivating learning in a humanities class through innovative research assignments: a case study*. (ERIC Document Reproduction Service No. ED479392).
- McKlin, T., Harmon, S. W., Evans, W. & Jones, M. G. (2002). Cognitive presence in web-based learning: a content analysis of students' online discussions. *ITFORUM Paper #60*. Retrieved August 12, 2005, from <http://it.coe.uga.edu/itforum/home.html>
- Moore, M. G. (1991). *Theory of distance education*. Paper presented at the Second American Symposium on Research in Distance Education, May 22–24, The Pennsylvania State University, University Park, PA.
- Passman, R. & McKnight, K. S. (2002). *The reflective discussion group: focused discussion in a high-stakes environment*. (ERIC Document Reproduction Service No. ED464947).
- Pawan, E., Paulus, T. M., Yalcin, S., & Chang, C-F. (2003). Online learning: patterns of engagement and interaction amongst in-service teachers. *Language Learning & Technology*, 7, 3, 119–140. Retrieved on December 16, 2003, from <http://llt.msu.edu/vol7num3/pawan/>
- Pilkington, R. M. & Walker, S. A. (2003). *Facilitating debate in networked learning: reflecting on online synchronous discussion in higher education*. (ERIC Document Reproduction Service No. EJ670041).

- Renner, P. (1999) *The art of teaching adults: how to become an exceptional instructor and facilitator*. Vancouver, BC: The Training Associates.
- Saba, F. & Shearer, R. L. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *The American Journal of Distance Education*, 8, 1, 36–59.
- Salmon, G. (2000). *E-moderating. The key to teaching and learning online*. London: Kogan Page.
- Seaman, D. F. & Fellenz, R. A. (1989). *Effective strategies for teaching adults*. Columbus, OH: Merrill Publishing Company.
- Strauss, A. L. & Corbin, J. (1994). Grounded theory methodology: an overview. In N. K. Denzin & Y. S. Lincoln (Eds), *Handbook of qualitative research* (pp. 273–285). Thousand Oaks, CA: Sage.
- Tenenbaum, G., Naidu, S., Jegede, O. & Austin, J. (2001). Constructivist pedagogy in conventional on-campus and distance learning practice: an exploratory investigation. *Learning and Instruction*, 11, 87–111.
- Thomas, A. (1998). *The interactive, virtual management information systems (MIS) classroom: creating an active learning environment on the Internet*. (ERIC Document Reproduction Service No. ED427682).
- Thomas, M. J. W. (2002). Learning with incoherent structures: the space of online discussion forums. *Journal of Computer Assisted Learning*, 18, 351–366.
- Williams, C. (2002). Learning on-line: a review of recent literature in a rapidly expanding field. *Journal of Further and Higher Education*, 26, 3, 263–272.

Copyright of British Journal of Educational Technology is the property of Blackwell Publishing Limited and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.