

U.S.–Africa Virtual Collaboration in Globalization Studies: Success Factors for Complex, Cross-National Learning Teams

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This case study highlights findings from the first two years of a cross-institutional and cross-national effort to link university students in South Africa with university students in the United States via a graduate seminar on globalization and the information society. The seminar is taught using synchronous and asynchronous web-based tools, providing students with the opportunity to participate in complex, cross-national learning teams. These *Global Syndicates* represent important stakeholders in globalization processes. Trust, culture, and ideology emerge as key factors for success in this distributed learning environment. Hindering factors include absence of group process skills, low levels of individual participation, cross-cultural differences in communication style, academic expectations, and work ethic.

Keywords: distance learning, virtual teams, collaborative learning communities, globalization

As the processes of globalization continue to unfold and an information economy and knowledge society emerge (see, *inter alia*, Castells, 1996–98; Mansell and Wehn, 1999; Mittelman, 2000), new organizational models are being explored that attempt to harness the potential and mediate the challenges of this historic period. Increasingly, people working in public, private, and nongovernmental sectors are using information and communications technologies (ICTs) to enhance their ability to work collaboratively, across borders, without all or any of the participants having to be physically co-located (National Research Council, 1993; Finholt and Olson, 1997; Olson and Olson, 2000; Teasley and Wolinsky, 2001; Cogburn, forthcoming).

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Cross-national teams are on the rise, and the ability to engage in complicated problem solving—*knowledge work*—in a geographically distributed manner is a significant feature of this new era of international affairs (Burton-Jones, 1999). Since the events of 11 September 2001, these approaches have taken on even greater importance.

In addition, there is growing evidence of marked disparities between the developed and most of the developing world in access to and use of ICT (Human Development Report, 2001). Addressing this global “digital divide” is a complex problem. It requires more than providing access to new technologies and extends to building the human capacity to engage effectively in its use and governance. Given these multiple challenges, how do we prepare our students to work in settings that cross multiple time zones, organizations, and cultures? And how can we help them to better understand the implications of these new technologies for globalization processes including the changing roles of nation-states and concomitant challenges for society in an information-intensive and complex era? These questions are complementary to the ones raised by other scholars exploring new ways to teach international affairs, especially international political economy (Amoore and Langley, 2001).

We address these questions by discussing an ongoing international collaboration between the United States and South Africa in the use of information and communication technologies both in teaching international affairs, and as a subject of such study. The collaboration links university students in South Africa with university students in the United States through a graduate seminar on Globalization and the Information Society. The seminar involves the random assignment of students to one of five teams, or *Global Syndicates*. Each Global Syndicate represents a major stakeholder grouping in the information society (i.e., Global or Multinational Corporations; Developing Country National Governments; Developed Country National Governments; Intergovernmental Organizations; and Nongovernmental Organizations). While the findings presented here stem from one case, studied now for two of the past four years, they highlight success factors (and barriers to success) that may have implications for teaching international affairs using cross-national, distributed collaborative learning teams more broadly. Further, this study presents a synchronous and asynchronous pedagogical model that can inform efforts on other campuses around the world.

The Case Study

Researchers at the University of Michigan School of Information established in 1999 a Collaboratory (“a center without walls,” Wulf, 1989) on Technology-Enhanced Learning Communities (Cotelco) with the support of the W. K. Kellogg Foundation (WKKF), the Alliance for Community Technology (ACT), and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Cotelco is designed to facilitate research that enhances our understanding of the factors contributing to successful distributed knowledge work between developed and developing countries. Using a suite of commercially available Web-based collaboration tools, Cotelco brings together faculty, staff, and students from the University of Michigan and American University in the United States and the University of the Witwatersrand and the University of Fort Hare in South Africa to develop and conduct collaborative research, share data, engage in distributed research team meetings, and to deliver a semester-long weekly, geographically distributed graduate seminar entitled “Globalization and the Information Society: Information Systems and International Communications Policy,” known as the *Globalization Seminar* at each of the participating institutions.

Literature Overview

There is a growing and important primarily U.S.-focused base of literature to help us understand the application of information and communications technologies to the process of knowledge creation and learning enhancement in international affairs. In their report analyzing a major think-tank initiative on the use of information technology to create a learning society in the United States, Garmer and Firestone (1996:5) argue that “the revolutions in computers and communications technology have given teachers and students an immense array of tools to enhance learning.” Citing a range of new technologies, they argue that these technologies can “aid teachers in adapting materials to different learning styles and promote equity in education by providing a diverse range of resources and experiences to students who might not otherwise be able to afford them” (p. 6). However, Tiffin and Rajasingham (1995:5) note that in technology-enhanced learning environments, there is the need for “a balance between computer interaction and human interaction. In the future we will need to strike a balance between telelearning and conventional classroom learning.” These arguments have influenced the design of the class described here to include a mixture of co-located faculty involvement with virtual synchronous learning, or what we call the “circuit-rider” model.

Stating that peer networks are an equally important resource, Brown and Duguid (2000:221) explain that the students in the Stanford Engineering TVI (tutored video instruction) whom they studied were formed into groups that became learning communities. The students in this distance education course thus consistently outperformed those residentially based students when tested on course material (pp. 221–222). This result was true, even though the distance students entered the course with “lower academic credentials” (p. 221). Further, Brown and Duguid explain that the TVI method “requires viewers to work as a group and one person from that group to act as tutor, helping the group to help itself. This approach shows, then, that productive learning may indeed rely heavily on face-to-face learning, but the faces involved are not just those of master and apprentice. They include fellow apprentices” (p. 222). Our finding from our two-year study of the *Globalization Seminar* that the global virtual teams used in the seminar are critical to a successful distributed learning environment supports this earlier work.

Previous research has shown that students who experience collaborative learning in the virtual classroom are most likely to rate virtual course outcomes higher than traditional course outcomes (Hiltz, 1990). Harasim et al. (1995:30) define collaborative learning as “any learning activity that is carried out using peer interaction, evaluation, and/or cooperation, with at least some structuring and monitoring by the instructor.” Collaborative learning in the virtual classroom is grounded in “a learner-centered model that treats the learner as an active participant” (Harasim, Calvert, and Groenboer, 1997:149). Using active and collaborative learning approaches, promoting meaningful feedback, and offering opportunities for intergroup collaboration, resource sharing, and collaborative writing have all been identified as fostering collaborative learning in virtual distance education (Palloff and Pratt, 1999). As Palloff and Pratt explain, learning is driven by “*the interactions among students themselves, the interactions between faculty and students, and the collaboration in learning that results from those interactions*” (1999:5; original emphasis).

Examining these interactions calls for an understanding of social and cultural dynamics. Lipnack and Stamps (1997) focus on the boundaries crossed in virtual teams. These include groups, organizations, disciplines, distance, time, and cultures. These boundary-crossing interactions offer the basis for building (or hindering) trusting relationships in virtual teams. In their study of global virtual teams in university settings, Jarvenpaa and Leidner (1998) examined whether trust

can exist in virtual teams, how this trust develops, and what communication behaviors facilitate trusting relationships in virtual teams. The virtual teams participated in a six-week collaborative learning project organized by the University of Texas at Austin. They report that global virtual teams can develop trust but suggest it may take the form of “swift, depersonalized, action-based trust” rather than a more “interpersonal and socially based trust” (p. 23). As for how global virtual teams develop trust, Jarvenpaa and Leidner found that initial electronic messages were crucial to establishing high levels of trust because they set the tone for team interaction. At the start of the project, high trust teams conveyed confidence and optimism in their early messages whereas low trust teams expressed more skepticism in initial messages. These findings are consistent with earlier research on the lasting impact of initial group communication patterns (Gersick, 1988; Gersick and Hackman, 1990).

In terms of the impact of culture, Jarvenpaa and Leidner found that culture did not influence perceptions of trust in the project’s global virtual teams. They suggest that “electronically facilitated communication may make cultural differences irrelevant” by eliminating most nonverbal cues such as dress, gestures, greeting styles, and accents (1998:25). As cultural differences become less noticeable, perceived similarity among virtual team members may rise (Jarvenpaa and Leidner, 1998). This finding contrasts starkly with those relating to culture in our work. We find that cultural differences profoundly influence the development of trust in the seminar teams, including pronounced differences in economic ideology and attitudes toward capitalism and socialism.

Hofstede (1996) provides support for our findings, calling culture the “software of the mind.” “Every person carries within him or herself patterns of thinking, feeling, and potential acting which were learned throughout their lifetime. . . . [We] will call such thinking, feeling, and acting *mental programs*, or as the sub-title goes: ‘*software of the mind*’” (Hofstede, 1998:4; original emphasis). Indeed, we as teachers need to recognize the “software” of the team itself—the very culture of the team that unfolds as they work together.

We recognize that our seminar participants bring with them a history of experiences and concomitant expectations that shape their encounters with our seminar. Indeed, the findings reported here reflect a specific generation of students who, for the most part, have experienced virtual learning only recently. Those students who have worked and learned with computers since preschool may present different patterns of learning outcomes. There is scant data reported in current literature that addresses such issues.

In terms of physical infrastructure, Tiffin and Rajasingham (1995:15) suggest that learners could participate in this virtual learning environment from almost anywhere, including their home, conventional school, or “local community center.” Minoli provides a more thorough analysis of the various types of technology options to consider in modern distance learning initiatives (Minoli, 1996:13–37). The infrastructure used in our *Globalization Seminar* allows users to participate from anywhere they have access to the Web, although most students came to the physical laboratory classroom for the regular seminar class period. Some students were able to access the seminar from Canada and Japan when they had to travel on business; thus not missing a day of the seminar that they would have otherwise missed. Ideally, geographically distributed learning environments should be both flexible and robust, and designed to be highly interactive. In these environments, the learner can operate simultaneously at multiple levels and move between them with ease. In their analysis, Tiffin and Rajasingham (1995) show some of the limitations of earlier computer-aided instruction (CAI) models. They acknowledge that many early CAI approaches were far too linear, and ignored much of the complexity that actually occurs in the learning process. The geographically distributed learning environment reported here has overcome some of these limitations.

Finally, our ongoing approach confirms the findings of Garmer and Firestone (1996). In our case, the cross-national and cross-university collaboration allows for a sharing of technical resources and practical know-how and show-how within and across developed and developing country participating institutions. Of the three founding partner institutions, Witswatersrand has knowledge resources in development studies and in computer science; American University contributes knowledge resources in cross-cultural communication and communication policy; and the University of Michigan brings knowledge resources in information science and community technology, along with technical know-how and show-how resources.

Case Study Questions

From this brief literature overview, we begin to see the contours of our case study questions for the *Globalization Seminar*. Given the transformation of the global economy to a more knowledge-based and geographically distributed form, it is increasingly important for universities to be able to equip students with additional skills required for this period. These skills include using an interdisciplinary approach; identifying problems; acquiring, critiquing, managing, and disseminating information; negotiating in cross-national and cross-cultural settings; and working in geographically distributed virtual teams (Cogburn, 1998). The *Globalization Seminar* case illustrates that this can be done.

The first key question explored in this case is what amount of human-interaction/computer-interaction mix the students prefer. Tiffin and Rajasingham (1995) suggest that the balance between human-interaction and computer-interaction is a critical factor in the success of a virtual learning environment. Brown and Duguid (2000) suggest that this would be even more important as the learning environment becomes more complex, and geographically distributed. The case provides data on student views of the virtual vs. physical mix of the seminar plus the virtual team component.

The second key question explored in this case is whether a collaborative learning community is built. Brown and Duguid (2000) argue that learning is a social process, and that “peer networks” are an equally important resource to faculty and university resources. Hiltz (1990) finds that “collaborative learning” enhances student ratings of virtual courses. Thus, we explore whether students engaged in those virtual teams (Global Syndicates) that evolve into “learning communities” will have more collective and individual success in the seminar, and whether they will have a higher degree of satisfaction with the seminar.

The third question explored in this case is whether *trust* can develop in global virtual teams, and the impact, if any, that culture and ideology have on its development. Jarvenpaa and Leidner (1998) found that a form of “swift, depersonalized, action-based trust” might develop in global virtual teams under certain conditions where communication levels were high, positive, and sustained. The case highlights how trust is developed in some, if not all, of our Global Syndicates and that those teams in which trust develops had participants who achieve higher levels of success and satisfaction with the seminar.

The fourth and final question explored in this case is what impact the degree of technology mixture has on collaborative learning. Most of the computer-supported collaborative learning experiments have focused on asynchronous technologies (Hazemi, Hailes, and Wilbur, 1998). However, nearly all of the literature suggests that a variety of technologies are important to increase the following aspects of computer supported collaborative learning: (1) creation and manipulation of virtual spaces, (2) multiple forms of representation, (3) continuous but not continual communication, (4) management of the metaphor, (5) diversity of access points, (6) interactivity, and (7) socialization (McLellan, 1997; Norman, 1998; Tiffin

and Rajasingham, 1995). In the *Globalization Seminar*, we can explore whether the students overcome what may have been initial fears and become comfortable using both the synchronous and asynchronous technologies used. Further, we can see whether students find both the synchronous and asynchronous technologies of equal value.

Thus, the *Globalization Seminar* case provides an opportunity to explore questions key to international studies teaching and curriculum building. It exemplifies one way a suite of commercially available Web-based technologies can be used to create a successful geographically distributed, synchronous, and collaborative learning environment for graduate studies between South Africa and the United States.

The Case: An Inside Look at the Globalization Seminar

The *Globalization Seminar* is an advanced, interdisciplinary, graduate-level seminar addressing questions of international regime formation for the emerging Global Information Infrastructure and Global Information Society. It involves a diverse group of graduate students at a research-oriented U.S. state university, a private U.S. university, and two South African universities (one urban and one rural).

Administratively, the project director/principal investigator was appointed to faculty positions at each of the participating universities (with the exception of the University of Fort Hare) and was ultimately responsible for the seminar at each location. Each university had a site coordinator that assisted the professor in the conduct of the course and in the administration of the project.

A computer lab on each campus was reserved to conduct the seminar, and allowed each seminar participant to have individual access to the collaboration tools. Each lab also included a data projector to display a standard audience members' interface to the global seminar room. The technologies used to support the *Globalization Seminar* involved a suite of commercially available Web-based tools rather than a single, integrated package. This allowed us to use the course Website to create an integrated environment of the most robust tools for the expected function (rather than settling for close approximations integrated into a single package).

The three primary collaboration technologies used to create the distributed learning environment were (1) Placeware Conference Center 3.0, (2) O'Reilly WebBoard 3.5, and (3) Xerox DocuShare 1.5. Several other collaboration tools supported the seminar such as presence awareness packages (AOL Instant Messenger and ICQ) and Web-based virtual reality (Active World's EduVerse). See the Appendix for more detailed descriptions of the technologies.

Each spring semester, students at the participating universities registered for the *Globalization Seminar* on their own campus. The seminar was conducted over a 13-week period. At the beginning of the semester, the professor randomly assigned students to the course's five Global Syndicates (GS, or virtual team) by selecting names in alphabetical order from each participating university's list of registered students. The professor also assigned each GS a unique stakeholder perspective (i.e., multinational corporations, developed country governments, developing country governments, nonstate actors) in the globalization and emerging information society debate. GS team members themselves at the beginning of the semester decided on a specific institutional identity consistent with their assigned stakeholder perspective.

As the pilot study unfolded, we were able to develop a very effective instructional template for the distributed learning environment. It consisted of the following elements, in chronological order: (1) assignment of students to virtual teams constructed as Global Syndicates; (2) introductory training sessions

on the technologies used in the seminar, the rationale behind the distributed learning environment, and training on the culture and practices of virtual teams; (3) an introductory presentation, which allows the students to become even more familiar with the technology by introducing themselves to the seminar participants; (4) a Global Syndicate pilot project, which encouraged the GS to get moving on its protocol development and administrative matters; (5) a mid-term paper and presentation that allowed the students to present their individual perspectives on the seminar material; and (6) a final syndicate paper, presentation, and debate bringing together all of the material and perspectives in the seminar.

Data and Analysis

Primary data for the case come from seminar participants, who are required to complete an 80-question evaluation survey including 25 open-ended and 55 closed-ended questions. The questions are divided into six parts. Part I focuses on demographic data; Part II on general perspectives on the seminar and the virtual learning environment; Part III on the Global Syndicate approach and their virtual learning community; Part IV on institutional issues, such as support and infrastructure; Part V on amount of preparation for the seminar; and finally Part VI on the collaboration technologies used in the seminar.

The data are analyzed primarily through qualitative and descriptive techniques. Given the limited sample size (total $n = 39$: 1999, $n = 23$; 2000, $n = 16$), no predictive statistics were used in the analysis. The case study method from the qualitative research tradition was used to evaluate the learning experience of each Global Syndicate. Thick-narrative case descriptions of the five Global Syndicates from 1999 and 2000 were prepared using data gathered from (1) the messages that team members posted on WebBoard, and (2) the students' essay responses to Global Syndicate questions on the course evaluation. The qualitative research goals were description and understanding, and attention was directed at identifying some universal points for comparing the Global Syndicates. The following points of comparison emerged: development as a learning community, use of course technologies, communication patterns, group processes, and trusting relationships.

The Global Syndicates were distinguished by the varied cultural backgrounds of their team members. Data on the students' cultural backgrounds were obtained from their introductory PowerPoint presentations delivered at the start of the course. Four of the five Global Syndicates had at least two South African members and one Asian international student member. Moreover, there was considerable cultural diversity among the course's American students, who included African-American, Caribbean-American, Indian-American, Peruvian-American, Armenian-American, and Arab-American cultures. At least four of the U.S. students were born in another country and came to the United States after spending their childhood years overseas.

While we have tried to be as rigorous as possible in defining the terms and conditions of this study, there are limitations. The focus on only one major case, the *Globalization Seminar*, is in itself a limitation. It is difficult to determine if the ostensible success of the *Globalization Seminar* is in any way related to the subject matter, the instructor, or a wide range of other factors. Also, due in part to a research design that evolved over time, and the limited sample sizes discussed above, there may be less potential for generalizing the findings of this study than in a tightly controlled experimental design. We have worked to minimize the effects of potential biases (and/or to explicitly acknowledge them) at every point in this research endeavor. We will attempt to address some of these limitations in future research.

General Findings

In the *Globalization Seminar* we focused on creating a geographically distributed learning environment that was conducive to maximizing interaction between the professor and the students, and amongst the students themselves. Our intention was to facilitate communication and feedback irrespective of the physical or virtual presence of the professor.

Overall Student Perspectives on the Seminar

From the perspective of student satisfaction, the seminar was a success. A large majority of the students (72%) would register for the course again, and a large number of students (66%) would recommend it to a friend. Interestingly, a fairly large number (29%) seemed to be unsure about recommending the course, as is, to a friend. This hesitation may be due to the widespread perception (60%) that this course demands more time than the average course, with the majority of students (57%) spending five or more hours per week studying for the seminar. However, the vast majority of the students (82%) would have still enrolled in the seminar, “even knowing how intensive it would be.” Only one student selected the response “no, not with any instructor,” and only one other student selected, “I doubt it, but only with another instructor.” There may be a high correlation between those students that would recommend the course as is, and/or willing to take another similar seminar and the students who either enjoyed the learning experience after getting used to it and learned a lot, or found that the virtual was a better learning experience, but these possible correlations are yet to be explored.

In terms of gender differences, a large majority of the men (83%) said they would register for another course like this, while a lower majority of women (65%) agreed with this sentiment. A larger number of the women (35%) were unsure about registering for a similar course, compared to a much lower number of men that were unsure (17%). Also, a large majority of women (91%) felt as if they developed new or critical perspectives about the world from the seminar, whereas only half of the men (50%) felt that way, with a large number (42%) saying they already “knew much of what was discussed

In the final evaluation survey, students were asked which approach—physical, virtual, or gradations thereof—they preferred for the professor’s lectures. We must note that the “physical lecture” in this case, is still a “virtual” lecture delivered simultaneously to students at all four locations. The “physicality” only denotes the location of the professor, whose primary means of interacting with students during the lecture in that physical location is still via the computer interface. A large number of the students (62%) had a “definite” or “slight preference for the *physical* lecture.” However, a substantial number of students (21%) had either a “definite” or “slight” preference for the *virtual* lecture.

Most of the students (56%) enjoyed the seminar experience when the professor was not physically at their location. Interestingly, *none* of the students selected the response, “I didn’t really learn anything” when the professor was at another location. However, a disturbingly large number (24%) said that they only learned a little when the professor was away. A slim majority of students (50%) felt that they “enjoyed the experience, after getting used to it, and learned a lot.” Two students (one from each year, one with a final grade of A+, and another with a final grade of A-) felt that the *Globalization Seminar* was “sometimes better than being there” in the Hollan and Stornetta (1992) sense.

When analyzing for gender differences in the group (women = 23 and men = 11), some interesting findings emerge. A majority of women (43%) had a “slight preference for the physical lecture,” while a majority of men (34%) had a “slight preference for the virtual lecture.” Of the two persons who indicated that

the “virtual experience was sometimes ‘better than being there,’” both were men. However, of the two respondents who indicated they “definitely preferred the virtual lecture,” one was female, and the other had missing data.

There was a pretty even distribution in the sample in terms of age. However, some interesting differences also emerge when analyzing for age. Of the two respondents that indicated that the “virtual experience was ‘better than being there,’” both were over 30. The most negative responses to the virtual experience appear to come from the 24–27 age range (50%), who believe they were only “able to learn a little” when the professor was away.

Most of the students appear to have been socialized during their school years to become accustomed to the physical presence of an instructor; only a small minority of students (34%) had ever had any distance learning or technology-enhanced learning course. One can only wonder what the data would indicate in cases where the students either had an entire educational program with similar pedagogy such as virtual seminars, or had come through a school system at the elementary and secondary levels that utilized at least some distance-education learning situations.

Global Syndicates as Collaborative Learning Communities

At the beginning of the semester, the professor randomly assigned all students to virtual teams constructed as Global Syndicates. Each Global Syndicate (GS) consisted on average of six members, with a maximum of two participants from any given university. These Global Syndicates adopted a stakeholder identity as described earlier, and engaged in a series of assigned and informal assignments and tasks related to international strategy, policy formulation, and regime development in the context of Globalization and the Information Society. Thus, these Global Syndicates are a critically important part of the environment for this research because they constitute the distributed collaborative learning communities we are trying to explore.

There is some evidence that collaborative learning communities developed within the Global Syndicates in the seminar. The vast majority of students (83%) reported that their GS became “a ‘learning community,’” that is, “assisted each other with understanding the material and concepts in the seminar;” with a large number (37%) even asserting that their GS was “a critical component of the learning.” An interesting gender effect may have emerged here. All of the men (100%) felt that their GS became a learning community, while a much smaller number of women (74%) agreed.

Further, a surprisingly large number of students (47%) said that learning communities emerged in the seminar outside of their assigned Global Syndicate. Another possible gender effect is present here. A majority of men (71%) felt this way, but a much smaller number of women (33%) agreed. This may be explained in part because many men were observed to be moving between the virtual teams (during breaks, and sometimes during seminar sessions) talking to and trying to meet women from other Global Syndicates.

All of the students (100%) felt that the Global Syndicate approach was valuable, with a slim majority (51%) of those students responding that there was even “tremendous” value in the approach. A majority of students (77%) believed that the Global Syndicates helped them to understand the “challenges and opportunities of global virtual teams,” with several of those (37%) responding that they felt “ready to participate in one” professionally.

In terms of seminar outcomes (letter grades and numerical scores, and experience with distance education), the Global Syndicate with the most successful average seminar score had the highest confidence in future participation in virtual teams, about the class average of team level of prior experience with distance education, and the second highest level of perception of the team as a learning

community. Conversely, the Global Syndicate with the least prior experience with distance education and a lower, although not the lowest perception of the team as a virtual community, also had the lowest team average on the seminar score.

Trust, Culture, and Ideology in the Globalization Seminar

Of all the important variables explored in this study, these three are perhaps the most complex and underexplored. This limitation is primarily because the quantitative data for these variables were not collected consistently in the seminar; thus, our analysis relies primarily on qualitative data and analytical techniques. These limitations notwithstanding, the presence or absence of trust among Global Syndicate members emerged as an overarching factor in learning community development, and ideological conflict persisted as a mechanism of division. In each instance of a failed or less successful learning community, problems with trust were present from the team's inception. This is particularly true for the Global Syndicate that, as indicated above, has consistently had a low self-perception as a "learning community." In particular, ideological differences among the team members turned out to be major stumbling blocks to that syndicate becoming a learning community. (The stakeholder grouping for this less successful learning community was global and multinational corporations.)

The cross-case analysis of the five Global Syndicates shows that the initial success of completing a group assignment in a timely and effective way was one clear source of building early trust among team members. It appears that students wanted to have team members upon whom they could depend. These are factors that will be explored extensively in our future studies.

Our limited data suggest that cultural factors are at work in cross-national collaborative learning processes, and may affect the level of trust that develops among team members. Students in two Global Syndicates—the two teams that experienced the least success in building a learning community—reported in their evaluation essays that American–South African differences in communication and academic styles likely contributed to the low participation rates of South African team members. This low participation rate, in turn, generated a relationship of low trust between the Americans and their teammates in South Africa. Of course, the question of how culture influences group learning and the building of trusting relationships goes beyond the American–South African divide. The *Globalization Seminar* involved students with a myriad of cultural backgrounds, including Asian, Caribbean, and African-American, and included several Americans who were born overseas and spent part of their childhood in cultures as diverse as Jamaica, United Arab Emirates, Peru, and Iran.

Appropriate Technology Mixture

The final factor explored in this case is the impact of degree of technology mixture. Most of the computer-supported collaborative learning experiments have focused on asynchronous technologies (Hazemi, Hailes, and Wilbur, 1998). However, nearly all of the literature suggests that a variety of technologies are important to increase learning outcomes: (1) creation and manipulation of virtual spaces, (2) multiple forms of representation, (3) continuous but not continual communication, (4) management of the metaphor, (5) diversity of access points, (6) interactivity, and (7) socialization (McLellan, 1997; Norman, 1999; Tiffin and Rajasingham, 1995).

In the geographically distributed learning environment built for the *Globalization Seminar* we used a wide range of commercial off-the-shelf technologies, all of which were Web-enabled. We then surveyed the seminar participants to gauge their perspectives on the technologies used in the seminar and organized the findings

according to the McLellan, Norman, and Tiffin and Rajasingham categories described above.

Creation and Manipulation of Virtual Spaces

Of the technologies used in the geographically distributed learning environment for the *Globalization Seminar*, the one most supportive of the creation and manipulation of virtual spaces is Placeware Conference Center, a Web-based, real-time conferencing tool. Although the virtual auditorium itself is pre-made and cannot be manipulated (which seems consistent with the metaphor: after all, one cannot redecorate the walls or move chairs around at will in a real auditorium, either), within it students are allowed significant freedom of movement (e.g., leaving and entering the auditorium, moving to a different row). They are also encouraged, even required, to contribute to the ongoing activity in this virtual space, for example, by sending questions to the presenter, delivering their own presentations, and engaging in small-group discussions. Students become active participants and co-creators of every online session.

Multiple Forms of Representation

Again, the most important tool in the seminar in this respect would be Placeware, which offers an impressive array of forms of representation, including voice (VOIP), mood indicators, anonymous voting, textual chat, graphical markup, sketching, recorded sessions, visuals (slides and Web pages), and seating chart.

Continuous but Not Continual Communication

Our tools also provide for this aspect of infrastructure development, and facilitate continuous communication. Tools in this category would be WebBoard, DocuShare, and the presence awareness packages (i.e., AOL Instant Messenger and ICQ). However, most students failed to take significant advantage of the virtual office hours offered by the professor or the site coordinators with only 37% using virtual office hours 0–1 times, and 69% using it five or less times during the semester. Overall, women used the virtual office far less frequently than men. Further evidence of this use is provided in Table 1.

A majority of students (54%) would like to see more synchronous technologies used in the seminar, while a small number of these (13%, all women) would like all of the technologies used in the seminar to be synchronous. Only a very small number of students (6%) preferred the asynchronous technologies to the synchronous ones. Also, a majority of students (74%) felt comfortable asking questions in this distributed learning environment, with a small group (17%) responding that they “asked a question in nearly every class.” By the end of the seminar, the vast majority of the students (97%) felt as if they were able to use the seminar technologies with only a few problems, with a majority (57%) reporting that they felt extremely comfortable with the seminar technologies. No gender

TABLE 1. Gender Use of Virtual Office Hours Cross-tabulation (%)

	<i>0–1 During Semester</i>	<i>2–5 During Semester</i>	<i>About Once a Month</i>	<i>About Once a Week</i>	<i>Several Times a Day</i>	<i>Total</i>
Male	16.7%	25.0%	25.0%	25.0%	8.3%	100.0%
Female	47.8%	34.8%	8.7%		8.7%	100.0%
Total	37.1%	31.4%	14.3%	8.6%	8.6%	100.0%

effects were suggested by the data. Table 2 summarizes student perspectives on the seminar technologies.

Management of the Metaphor

The primary collaboration tool for the seminar, and the one that best illustrates this design point, is the Placeware Conference Room. Placeware uses the metaphor of a seminar room, with clearly defined “stage,” audience area, rows of seats, display screen, and so on, thus making the virtual learning environment much less abstract and alien than it might have been otherwise. As Table 2 illustrates, nearly all of the students felt that Placeware was the most important tool contributing to their learning experience and understanding of course content in the *Globalization Seminar*.

Diversity of Access Points

Since all of our collaboration tools are Web-enabled, they can be accessed from anywhere on the planet where there is Internet connectivity. While we provide for a computer lab where our students are expected to attend the seminar, there have been numerous occasions when students, faculty, and/or guest lecturers have attended the seminar from home or work, and from geographical locations as diverse as Tokyo, Canada, Cairo, Switzerland, and Hawaii.

Interactivity

Interactivity has been a key design feature of our information infrastructure environment. All of the tools, from Placeware to DocuShare, provide for interactivity. For example, in Placeware, during a seminar session, not only do students hear the voice of the lecturer, they may ask questions of the presenter at any time, and chat (via voice or text) with their virtual team members “sitting next to them” during the lecture (where “sitting next to them” could mean Johannesburg, Washington, D.C., Ann Arbor, or any points between or beyond). ActiveWorld’s Eduverse takes the interactivity to an even higher, nearly physical level, allowing participants to walk in and out of three-dimensional structures, see other participants as “avatars,” wave to them, follow them around, move objects. The vast majority of students (n = 31, 91.2%) feel that the Placeware Conference Center had a “positive impact” on their interaction with the professor, and a larger majority (n = 33, 94.3%) indicate that Placeware had a “positive impact” on their interaction with other seminar participants. WebBoard received a slightly lower endorsement for increasing interaction with the professor (n = 17, 50%), but still had a positive impact (n = 30, 85.7%) on interaction with students.

Socialization

Finally, our collaborative infrastructure does allow for socialization, primarily within Placeware, and secondarily within EduVerse. However, analysis of the WebBoard

TABLE 2. Summary of Student Perspectives on Seminar Technologies

<i>Technology</i>	<i>Positive Learning Experience</i>	<i>Positive Impact on Understanding Course Content</i>
Placeware	97%	91%
DocuShare	85%	27%
WebBoard	73%	49%

messages reveals a noticeable amount of social conversation that occurs within and between Global Syndicates during the course of a semester. These social uses of the technology are to be supported, in that they assist in the building of trust and social cohesion within the virtual teams. Also, again there is the finding of some of the male students taking the opportunity of the seminar to meet and talk to women outside of their Global Syndicates, and identifying the existence of learning communities outside of their GS at higher rates than women.

The course technologies themselves may have played a supportive or hindering role in the group learning experience. One syndicate's use of WebBoard to hold synchronous team meetings on nearly a weekly basis gave its members a regular opportunity to discuss the course readings and exchange opinions. By contrast, in the case of a less successful syndicate, some early failed attempts at synchronous WebBoard meetings (due to firewall problems) generated frustration among the team's members and hindered the building of collaborative learning processes. In all the Global Syndicate cases, the data indicate that the use of Placeware for synchronous chats on seminar days added to class learning and strengthened Global Syndicate group processes when those in place were already strong.

Success: Factors and Barriers

In summary, this study reinforces the findings of the year 2000 University of Illinois *Online Pedagogy Report* (written as a result of the discussions of 16 tenured professors at the university) that there can be high quality learning online. In addition, the low number of respondents in the *Globalization Seminar* who preferred the professor's virtual lectures to his physical lectures parallels student preferences reported in earlier studies (Webster and Hackley, 1997), which show that students in remote sites are less involved with learning than those at the site where the professor is physically present. This points to the need to involve continuously distant participants in the seminar discussions and a conscious mental shift on the part of the instructor to overemphasize the distant participants during a seminar session. This is also one of the reasons we adopted the "circuit-rider" model and moved the professor around to spend equal amounts of time physically at each university. In their study of active teaching and learning in international political economy and especially in globalization studies, Amoore and Langley (2001:28) suggest that "the nature of inquiry within the discipline has itself transformed so that the boundary between 'learning about' and 'experiencing' globalization is eroded." Our study perhaps reflects that reality better than any we have seen. Participants in the *Globalization Seminar* are simultaneously studying issues of globalization and the information society, while participating in highly globalized processes and geographically distributed, complex, cross-national learning teams.

The study also confirms Jarvenpaa and Leidner's (1998) findings regarding the importance of the development of early, action-based trust in successful cross-national collaborative learning. Moreover, our cross-case comparative data on Global Syndicate communication patterns reinforce their finding that high-trust teams engage in frequent communication characterized by behaviors such as providing feedback, clarifying and developing a consensus on tasks, and notifying teammates of upcoming absences.

While Jarvenpaa and Leidner (1998) found that culture does not influence perceptions of trust in global virtual teams, our findings indicate the contrary. Cultural differences in communication, work ethic, and academic styles contributed to trust problems between Americans and South Africans and, to a lesser extent, between Americans and other international students.

Our case study shows the importance of group processes and trusting relationships throughout global virtual teamwork, consistent with the earlier work of Lipnack and Stamps (1997). Our study also supports Riel and Harasim's (1994)

suggestion that future evaluations of Web-based collaborative learning should assess online social interactions. We captured rich data on learning community development, communication patterns, group processes, and trust through our qualitative analysis of the WebBoard messages posted by students in each Global Syndicate. On the whole, our case study goes beyond these earlier writings to demonstrate in a preliminary way the significance of cultural, group process, and social dynamic issues in cross-national collaborative learning.

One of the weaknesses in almost all studies of distance-independent education is the failure to focus on faculty member and university-wide organizational learning as a result of involvement in distance education. Our *Globalization Seminar* resulted in both faculty learning and inter-institutional learning, especially in the realm of technological know-how. While this article itself concentrates on cross-national collaboration and student learning, we argue that it is important not to overlook the learning that goes on among faculty and administrators as well as technology providers at each of the sites.

Factors that inhibited the development of a learning community included the absence of group process skills, low levels of participation by two South African teammates in a Global Syndicate, uneven distribution of work across team members, and inadequate communication with South African teammates due to technology problems and the time difference. Moreover, insufficient opportunities for social communication and bonding, the time constraints and personal problems of some team members, failure to respond to the initiatives of individual team members, and cross-cultural differences in communication, academic expectations, and work ethic hindered the building of learning communities.

The university imbalance within Global Syndicates may also have diminished collaborative learning outcomes. By serendipity, American University had more students participating in each Global Syndicate than the University of Michigan and the University of Witwatersrand. In four of the five Global Syndicates, the University of Michigan had only one representative on the team. Last, a miscellaneous set of more individualized, inhibiting factors was reported in the evaluation essays. These factors ranged from disliking group work to not having the typing skills for text-based chats.

In their evaluation essay responses, the students were more likely to cite barriers to collaborative learning than to discuss those factors that facilitated the development of a learning community. However, our review of the Global Syndicate cases identified the following factors that helped teams become learning communities: the presence of at least one person who brought group dynamics skills to the Global Syndicate experience; the active participation of at least one South African team member who overcame serious technological challenges through a commitment to the group learning process; and the use of enthusiastic, supportive, and positive communication by most members of the Global Syndicate.

Conclusion

In summarizing the answers to our research questions, we ask them again: to what degree can a suite of commercially available Web technologies be used to successfully create a geographically distributed, synchronous, collaborative, learning environment for graduate studies between South Africa and the United States? The answer to this question is that with the right mixture of technologies, institutional support, and pedagogical approach, a geographically distributed, synchronous, collaborative learning environment can be built successfully between South Africa and the United States.

What is the appropriate mixture of human-interaction/computer-interaction mix? Students still seem to prefer the physical presence of the faculty member (human interaction) over the completely computer-mediated environment

(computer interaction), even though the faculty member, when present, interacts with the locally based students through the computer.

It is possible for the Global Syndicate teams to emerge as collaborative learning communities. However, their emergence requires very specific conditions, some of which are described above. Our findings suggest that with the right technology, training, support, and pedagogical approach, geographically distributed virtual learning teams (with no expectation of face-to-face contact) can in some instances become learning communities. Contrary to some of the earlier studies, we find that trust, culture, and ideology play an important role in the *Globalization Seminar*. We also find that after getting used to the collaboration tools, the students prefer the synchronous tools, and would like to explore further the use of the Web-based virtual reality applications.

What pedagogical and administrative models best suit this distributed learning environment? During the course of the study reported here, we have developed a functional pedagogical model for creating a stimulating geographically distributed learning environment. Key to this model is a champion on each campus and a shared commitment to providing cross-national technology-facilitated learning communities.

The results of this research could have far-reaching implications. We have shown that it is possible to use a suite of commercially available technologies to create a geographically distributed graduate learning environment. We have also realized that critical to the success of such an initiative are institutional factors (agreements, assessments, etc.), human factors (culture, training, site coordination, administrative and logistical support), and technology factors (adequate information and communications technology infrastructure).

However, there are many unanswered questions emerging from this study. Perhaps foremost amongst these questions is the role that prior experience/socialization plays in computer-assisted learning. Additional research is needed to tease out carefully the complex roles of culture, gender, and age cohort in virtual learning situations. Questions as to what extent (and whether) students on a specific team adopt the actual perspective of the assigned stakeholder group needs in-depth exploration. The role and impacts of technology in such processes has yet to be addressed.

The specific influence of instructor roles and techniques also needs to be explored thoroughly. What about seminars where the instructor is never physically present or seminars that are taught by different instructors in collaboration with one another? The details of interinstitutional learning documented in this study need to be thoroughly examined. Do such collaborative efforts become institutionalized over time? What factors contribute to the success of such processes? As technology changes, how do the new configurations influence (if at all) virtual learning outcomes? What is the interaction between the subject matter of a course such as globalization and the information society and the mode of teaching such a course as it relates to successful learning outcomes?

In international studies future curriculum building, offering a course that provides an opportunity for participating in global virtual teams should be considered and may, indeed, be a mainstay. While some may argue that such a learning experience could be a fad, this case study illustrates that the international studies classroom of the future can institute a technology-facilitated cross-national learning environment that links students and faculty, recognizes and builds on cultural differences, and supplies opportunities for actually participating in and learning from the very information-intensive phenomenon about which they are studying.

While there are still a plethora of unanswered research questions to consider, the case study presented here does provide a replicable foundation that highlights the importance of trust and culture in designing successful cross-national collaborative

learning experiences. What this case study also does is illustrate in rich detail an option for learning that can only occur using technology that transcends classroom walls, national borders, and digital divides.

We are convinced that this virtual cross-national teamwork component of our case study provides value-added to traditional classroom learning, and gives tomorrow's international studies graduates an experience that matches the new possibilities for postgraduate working conditions. But this added value can only occur when attention is given to the cross-cultural communication and social interaction skills of all involved.

Appendix

Placeware Conference Server 3.0 was the primary collaboration tool in the seminar and was used for delivering weekly audio lectures in real-time (Voice Over IP (VOIP, Internet audio) using PowerPoint slides, live Web pages, and anonymous polls as visual pedagogical tools. In addition to the professor's lecture, Placeware allowed for formal and informal student questions and presentations to the seminar; real-time communication within teams; and voting, comments, and questions from the audience.

O'Reilly WebBoard 3.5 served as a venue for online discussions (threaded), listserv activity, group announcements, brainstorming, and exchange of files (through attachments), while its built-in HTML chat added a synchronous (real-time) component.

Xerox DocuShare 1.5 was used as a document management system and a virtual "team-space" that supported submitting and retrieval of assignments, group calendars, collaborative (asynchronous) editing of documents, or announcements.

All of these tools were integrated via the course Website, served by Netscape FastTrack 3.01. This featured seamless access to the course syllabus, reading list, digital library (password protected), seminar participants, contact and logistical information, and links to relevant Web resources. In selecting these tools for the *Globalization Seminar*, the course planners tried to avoid those that required anything other than a standard browser (Microsoft Internet Explorer or Netscape Communicator) of 4.x vintage or newer, which could be downloaded free from the Web. Even plug-ins and helper applications were frowned upon. With these self-imposed restrictions, the learning environment ensured that each student, in front of any computer equipped with at least a 28.8 kbps connection and a relatively recent Web browser, could engage in the following synchronous and asynchronous activities.

Synchronously

- Participate interactively in weekly lectures and seminar discussions
- Ask questions directly to the professor and to the other seminar participants
- Give their own presentations to the seminar and receive instant feedback
- Participate in real-time chat sessions with other students
- Discuss presentations with their fellow virtual team members as the presentation is being heard
- Engage the professor and site coordinators in virtual office hours

Asynchronously

- Read and respond to messages posted by other students on a discussion board
- Submit assignments to the instructor
- Download a paper or presentation being worked on by her group, contribute changes/additions, and upload it back

Check the date and time of a scheduled, online meeting of her group
 Access recorded lectures
 Check reading assignments and access some of the required materials
 Approach the instructor or the assistants with questions and comments

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