



Challenges of Virtual Teams in the Classroom

Anthony F. Chelte
Western New England College

ABSTRACT

Virtual teams have received considerable attention in the literature. Little systematic or empirical investigation to support the widespread use of these teams appears in the literature, however. Anecdotal evidence is highly touted in supporting the wider use of virtual teams and it has been suggested that the virtual team may be the organizational structure of the 21st century. This paper examines the use of virtual teams in the context of an MBA distance-learning course. Four teams were assigned for the course. Of these four teams, only one maintained a virtual team structure. Some initial findings are presented derived from team reports and a Team Assessment Survey.

Introduction

Team-based organizations are becoming firmly established features of the corporate landscape. Organizational experience has demonstrated that teams of employees are more productive, more creative, and better able to meet the challenges of an increasingly dynamic business environment (Townsend and DeMarie, 1996). Based on this knowledge, new organizational structures are emerging that provide flexibility, diversity and better access to information for all organizational members. The continual improvements in technology have, in part, paved the way for deployment of the virtual team that is an important element of these new structures (Nemiro, 2000). The ever-increasing deployment of this organizational element has given validity to the argument that the dominant structural property of the 21st century organization is that of virtual teams and networks of teams.

These new organizational elements are seen as the smart way to organize for flexible and cost-effective operations particularly for global operations (Lipnack and Stamps, 1999). These economies are achieved through the utilization of human capital across space and time through the deployment of virtual teams. The membership in these teams is typically based solely on needed expertise even when there is no history of interaction and the potential performance of such a virtual team is unknown (Potter, Cooke and Blathazard, 2000). The assumption, of course, is that these teams will be effective without face-time, and without the benefits of “knowing” your team members personally.

The technological revolution that has been occurring has greatly enhanced the speed in which new and innovative organizational structures are developed. The argument has been made that the “team” revolution and the technology revolution have been occurring simultaneously. The introduction of more effective and faster communication systems, high speed processors, and ever more sophisticated software has allowed organizations to enter the era of the virtual connection (Townsend and DeMarie, 1996:124). This virtual connectivity has created the opportunity for team members to interact meaningfully regardless of distance. The



effective deployment of this super connectivity can reduce costs, travel time, and increase organizational efficiencies through the development of virtual teams who may never meet in the traditional sense.

Formally defined, virtual teams are groups of geographically dispersed organizational members who communicate and carry out their activities through information technology (Kristof, Brown, Sims & Smith, 1995; Lipnack and Stamps, 1997). The traditional organizational structure is undergoing significant change as individuals are finding themselves working in an anywhere/anytime mode, connected to co-workers through information technology (Nemiro, 2000; O'Hara-Devereaux & Johansen, 1994). The emergence of virtual teams as a "hot" topic in management circles has been widely documented (Matthews & Gladstone, 2000; Melymuka, 1997; Soloman, 1998; May, 1997). However, little empirical research exists that explores the dynamics inherent in the virtual work environment (Furst, Blackburn & Rosen, 1999).

The literature is not in agreement as to the functionality or desirability of virtual teaming, however. For example, Glacel (1998) raises the question as to whether virtual teams can "really exist." Her contention is that "given the strict definition of teams, virtual teams exist only with great difficulty, if at all. For virtual teams to "evolve" and develop, a "firm foundation of non-virtual, face-to-face relationship building is essential and serves as a prerequisite for virtual teaming" (1998:12). Other criticisms suggest that without specific training, individuals cannot be effective virtual team members. Equally critical, some argue, is that many of the traditional cues of social interaction such as body language and hand gestures are lost in even the best teleconferencing and communications systems. One thing is clear in the literature, however. The concept of virtual teams has received little systematic empirical study. Much of the support for the value that is added by virtual teams comes from anecdotal evidence and individual company experiences. Thus, we have little consensus in the academic literature as to whether or not virtual teams are effective. As such, one wonders whether they will be lasting features of the organizational landscape. Despite the lack of systematic study, businesses are making wide use of the virtual team concept particularly in global firms.

With the trend for business decisions to be made by work teams rather than by individuals, the need to examine virtual team formation, deployment and performance in a variety of contexts becomes more pressing. Critics of the effectiveness of virtual teams stress the need for balance between high-tech and high-touch interaction among team members. The deployment of virtual teams in organizational settings requires that business students gain some experience with processes of "virtual teaming" prior to career entry. Business courses that provide a context in which to experience the strengths and limitations of virtual teams may prepare students to effectively manage the challenges that may be encountered in their professional lives.

To be sure, student teams (whether virtual or face-to-face) experience many problems along the way. Poorly defined goals and expectations, social loafing, mismanaged conflict, team member dissatisfaction and poor communication represent several of the potential dysfunctional elements of teaming that can occur among student teams (Cox and Bobrowski, 2000). However, when deployed effectively, student teams can increase productivity, raise morale and encourage



innovation. Effective team management by team members is the key element in minimizing dysfunction and enhancing the likelihood of a positive experience.

This paper provides an initial examination of the results of the use of virtual teams as a primary learning vehicle in the distance-delivery of an MBA course, Organizational Theory and Behavior which is part of the core in the MBA program. The course discussed in this paper was structured and delivered entirely on-line using an asynchronous delivery model. Students who enrolled in the course did so voluntarily as the opportunity to enroll in a traditionally structured course was also made available. As we have discussed elsewhere (cf. Chelte & Hess, 2001), distance-learning platforms are not appropriate for all. Students enrolled in this distance-learning course had experience with distance learning but did not have any experience with virtual teaming. The course structure represented an opportunity for direct experience with a virtual teaming process that was largely unfamiliar to the students enrolled in the course. Given that no student had prior experience with this process, we had the opportunity to “assess” the effectiveness of virtual teams in a distance-learning environment. Further, we were able to elicit the feedback of the students as to levels of satisfaction with the virtual team experience and its contribution to their learning goals.

The Setting

The College is a small private school in New England that has schools of Business, Engineering, Arts & Sciences and Law. The Business School offers the BSBA and the MBA degrees. Consistent with the College’s strategic plan, and the AACSB accreditation candidacy of the School, the College has committed itself to “elevating” its reputation beyond the northeast region. The School of Business has adopted a strategy which is mission driven and is characterized by a process of continuous improvement as it pursues AACSB accreditation.

Until recently, distance learning has accounted for a relatively minor proportion of higher education activity. “Now...it has become a pervasive and growing phenomenon. New technologies create more effective techniques to distribute learning in non-traditional ways. As a result, new organizational structures and learning arrangements are appearing throughout higher education” (AACSB, 1999:7). To be effective, however, these new structures must develop from specific and well-defined strategies that drive the institutions to respond to new and emerging market opportunities. It is clear that certain segments of the student market have responded positively to these options (Simons, 1999). Much less clear, however, is the answer to the question of which of these options represents the “right choices” for the B-School, its strategy and its stakeholders (Chelte & Hess, 2001).

As part of the overall College strategy, a systematic distance-learning initiative has been implemented as one vehicle for expanding the reaches of the institution. To this end, the College has provided significant funding for course development and delivery of Internet-based courses. The College has its own proprietary courseware platform and its use is gaining popularity among faculty and students. The courseware technology is also used as an enhancement to traditional courses. Over the last three years there has been a significant increase in the use of technology for course enhancement at the institution across all three schools. Interestingly, there has been very little resistance to technology among faculty at the College.



Individuals enroll in distance learning courses due to the increased time pressures in non-traditional students' personal and professional lives. These students look aggressively for educational programs that allow them to better balance the demands of the program and the demands of the other areas of their lives. Distance learning options have provided one alternative. It is important to note, however, that distance learning options are not preferred universally. There remains a strong demand for traditional classroom experiences characterized by face-to-face contact in which interactions occur between students and instructor and among the students themselves. For these students the value of educational technology is not so much for personal convenience as it is for improving the effective uses of the classroom time (Chelte & Hess, 2001).

The need to implement virtual teams in the classroom and to gauge their effectiveness as part of the larger educational experience is driven by the school's mission. The mission focuses primarily on the career preparation of students [1]. Further, the mandate to develop "technology-delivered educational" structures (AACSB, 1999) is consistent with the need for curricula to reflect changes in the increasingly technological workplace. As businesses make wider use of virtual teams, there is a responsibility on the part of schools of business to provide students with direct experience in the process of virtual teaming.

Despite the virtual teaming trends in business organizations, the use of virtual teams in delivering business education has not received wide nor systematic attention in the literature. The limited literature that is available has primarily focused on the technology involved in facilitating team-based communications or in conducting global research (Rockett, Valor, Miller & Naude, 1998; Miesing, 1998). This paucity of research should be cause for concern, as the deployment of virtual teams in organizations appears to be increasing. This environment represents an opportunity to carefully consider and implement virtual team processes as part of our course delivery mechanisms.

The Framework

A total of 20 students were initially enrolled in the course. Two students withdrew from the course voluntarily and subsequently enrolled in the traditionally delivered section. These two students withdrew within the first week of the course. Therefore, the teams that were created did not involve these two members. The eighteen students were grouped into four teams (Two teams of 4 members; and two teams of five members). The team members were selected at random by the instructor. None of the team members in any of the four teams knew one another prior to the course. This represented an ideal situation in which to note the process, progress, and problems associated with team formation and performance in a virtual team environment.

This approach approximates that of several organizations that have created virtual teams among members who have not worked together in the past and are often located across wide geographical locations. The students in this class were located within a 60-mile radius of the main campus and had attended courses at the main campus in the past. Because of this proximity to the campus (and to each other) students could meet face-to-face if they elected to do so. This became an important issue as the course developed. We will return to this topic later in the paper. Instructions were provided to all students explaining in detail the concept of



asynchronous distance learning, what to expect, and communication tools such as “chat” technology. Virtual teams were carefully defined and each individual’s responsibility was outlined clearly. Teams began with module 3 in Ancona et al. (1999) to set the stage for the development of team expectations, goals and individual roles.

The text and case material was drawn from various modules in the Ancona, et al. (1999) text. The reference to Module 3 in the instructions to the students is particularly important. Each team was required to complete and submit a “Team Report” at the beginning of the second week of the course. In this initial report, each team had to provide answers to the following questions:

“Who are we?”

“What do we want to accomplish?”

“How can we organize ourselves to meet our goals?

“How will we operate?”

“How can we continuously learn and improve?”

This requirement provided the opportunity for each team to establish its own ground rules before engaging in the assigned tasks for the course. This is an important consideration given that a “team often make assumptions about ground rules. Members believe that everyone knows how it should be and how everyone should behave. When someone else’s behavior fails to conform to one’s own expectations, people tend to be surprised” (Cox and Bobrowski, 2000:92). It is also well known that if rules are not clear and that there has been no discussion as to how problems will be managed, unnecessary conflict will occur. Katzenback and Smith (1993) found that effective teams develop rules of conduct at the outset to help them achieve their objectives and performance goals. Establishing ground rules can help to prevent social loafing and free riding (Cox and Bobrowski, 2000; Shepperd, 1993). Research by Gersick (1988) and Feldman (1984) and the process developed by Cox and Bobrowski (2000) suggest that the emphasis on the front-end development of group rules may be critical to team effectiveness. “While group norms usually develop gradually and informally as group members learn what behaviors increase effectiveness, it is also possible to short cut the process by conscious group decision” (Hackman, 1976; Cox and Bobrowski, 2000:93).

In addition to the teams’ setting of their ground rules, they also defined their goals for the course and the processes that they would use in fulfilling the requirements. The teams were required to chart their progress on an on-going basis and to modify (if necessary) their goals and processes. Approximately halfway through the semester a team report was required that reflected on the goals and processes of the team. This report would indicate whether the team goals and processes had changed and would reflect team performance and effectiveness. The procedure was repeated again at the end of the semester.



Collective responses are valuable from the team. However, we were interested in individual perceptions as well. Therefore, each individual completed a 34-item questionnaire developed by Ancona, et al (1999) that asks a battery of questions on various dimensions of team performance, effectiveness, interpersonal relations, and satisfaction. These data were collected at the end of the semester. In addition to individual responses to the questionnaire, teams were required to complete the same questionnaire. Each team completed this questionnaire at two points during the semester (at the midpoint and at the conclusion of the term). The teams could not simply “average” their collective responses, but were required to reach consensus over the rankings for each item. This provided an indicator of team effectiveness over time. Results of selected items from this instrument are discussed below.

In summary, team development, effectiveness, performance, interpersonal relations, and satisfaction were measured at key points during the semester. A combination of qualitative narratives (Team Reports) and a structured questionnaire (for individuals and teams) provided the opportunity to assess the overall effectiveness of virtual teams in the context of an on-line, distance course.

Findings

Four virtual teams were created for this course. Members of the class were informed as to who their teammates were through the electronic classroom (Manhattan). All of these students are employed full-time across a wide range of organizations including high-tech, health care, aeronautics, retail, and non-profit. Each of the team members had some experience working in teams in their organizations.

The electronic classroom was set up as a closed environment that was password protected. Each team had their own discussion area (Team Discussion) in which they could communicate privately to each other (without the professor or other teams). A Team/Teacher area was also established where teams could communicate with the professor privately (without other teams). There were other communication vehicles available including email and real-time chat modules that could be used by team members. As this was a distance-learning course, there was no requirement for any face-to-face meetings. However, if a team requested a meeting with the professor, he would be available for such a scheduled meeting.

Three of the four virtual teams met face-to-face prior to the first assignment. It was clear from their initial “Team Report” that these individuals were not comfortable working with people whom they had not met. Further, these individuals made it clear that they were unable or at least, uncomfortable, working at a distance on tasks that required team input. Before the first assignment was due (approximately 3 weeks into the semester) three of the four teams had begun to meet face-to-face on an on-going and regular basis. These meetings were held at least once per week. This behavior continued for these three teams throughout the semester. It appeared that virtual teaming (without face-to-face interaction) was not an option that these individuals preferred. All three of these teams also requested meeting face-to-face with the professor at least once during the semester. The remaining team did not meet face-to-face at any time during the semester. Nor did the members request any meetings with the professor. The four members of this team communicated through email, real-time chat, and telephone. Interestingly, this team neither performed better or worse than the other three teams.



The fact that three of the four teams decided to meet face-to-face is in and of itself an important development. These students made clear that they were not comfortable with the virtual team concept. Figure 1 provides selected comments from the Team Reports. These reports provide insight as to the motivation to avoid, abandon, and/or adhere to the virtual team structure. The team who maintained a virtual structure never met face-to-face yet were able to maintain a high level of communication utilizing the technology available. Figure 1 provides some insight as to this team's position.

Figure 1

Selected comments from Team Reports

Teams Rejecting the Virtual Team Structure

We have discovered that the on-line chat meetings were not very effective and have thus discontinued this method as a means of communication. We plan on increasing our frequency of face-to-face meetings, as these meetings are the most productive.

Our team agreed that meeting face-to-face to make decisions is the most productive way to proceed.

Face-to-face meetings helped us all to be able to put faces to names and get to know each other better.

Additional email correspondence will supplement the discussions from the [face-to-face] weekly team meetings.

Team Embracing the Virtual Team Structure

Due to the fact that we all have jobs, families, social lives and class on top of all this we need to be very organized and efficient. We will stay in constant communication through the use of Manhattan.



Given that three teams were not “virtual” and one team was, there is the opportunity for comparison beyond the “qualitative” comments derived from the Team Reports. The Team Assessment Survey developed by Ancona, et al. (1999) was completed both individually and collectively as teams. This 34 item questionnaire afforded us the opportunity to examine whether or not differences existed relative to the several dimensions reflected in the instrument. The teams completed the survey at two different times in the semester: at the mid-point and again at the conclusion of the course.

The 34 items in the Team Assessment Survey were derived from three separate sources (Ancona, et al., 1999). An initial exploration of the data to determine whether there are separate dimensions of the instrument revealed that there are eight distinct factors. The sample size, however, is very small. Further work needs to be done in determining whether these factors exist for larger sample sizes across different team types (virtual and otherwise). While beyond the scope of the current analysis, it is interesting to note that the preliminary investigation determined that individuals (and teams) are responding differentially to various aspects of the team experience. The factor analysis was performed for all individuals aggregated as well as for the team responses. The team questionnaires, as you recall, were administered at two different times during the semester. The factor analysis yielded the same eight factors across all conditions.

For our current purposes, selected variables from the questionnaire were analyzed to explore individual and team responses and to see whether there were differences between the teams that elected to meet face-to-face augmented by technology and the one team that maintained a virtual structure throughout the course. For purposes of clarity of presentation, Teams 1, 2 and 3 are designated as the conventional (face-to-face) teams; team 4 is the virtual team (Table 1).

TABLE 1:
Selected Results from Team Assessment Survey

Item	Mean Team 1	Team1 T1	Team 1 T2	Mean Team 2	Team 2 T1	Team 2 T2	Mean Team 3	Team 3 T1	Team 3 T2	Mean Team 4 virtual	Team 4 T1	Team 4 T2
Global	4.75	4.0	4.0	3.8	4.0	3.0	3.8	4.0	3.0	3.8	5.0	3.0
<i>Fair Share</i>	3.8	4.0	4.0	3.75	4.0	4.0	4.25	4.0	4.0	4.5	4.0	4.0



<i>Dec Making</i>	4.75	5.0	2.0	3.0	4.0	4.0	4.20	4.0	4.0	3.5	5.0	5.0
<i>Effec w/ Time</i>	4.5	4.0	4.0	5.0	5.0	5.0	3.6	4.0	3.0	4.0	5.0	5.0

The global item in the questionnaire asked whether “Members view themselves as a team (e.g. they work interdependently, have joint accountability, and are committed to joint goals), not a collection of individuals who have their own particular jobs to do.” The results indicate that the three conventional teams score on the positive side of neutrality (4.75, 3.8, 3.8). The mean response for Team 1 is clearly very high. The other teams’ scores are between “to some extent” and “to a very great extent.” The virtual team results are the same as two of the three conventional teams (3.80). When asked to respond to the survey as a “team” rather than as individuals, the results on this global item reveal an interesting finding. The three conventional teams report a 4.0 on this item. The virtual team, however, reports a 5.0 on this item. Remember, that these figures for the team reports reflect responses at the mid-point of the semester. When looking at time 2 (or the end of the semester), the results for the team reports suggests a downward trend for two of the teams and no change in two others. The virtual team’s score at the end of the semester, decreased significantly from the midpoint (3 versus 5). This is an interesting finding and one that needs to be further explored. One of the conventional teams also reported a decline in their evaluation of team performance (3 versus 4). The other two conventional teams had no change from the midpoint to the end of the term.

One of the controversial areas in utilizing teams in classroom settings is whether or not social loafing is allowed to occur. One item in the questionnaire asked whether “every member does his or her fair share of the work.” The results indicate that there are no substantive differences. At the team level the responses indicate that there is a perception of an equitable distribution of work. The same responses are reflected for individuals. Therefore this item did not appear to be a significant area of dissatisfaction for these students.

Responses to the item that assesses whether “all team members participate in decision making” reveals mixed results at the individual level. For the three conventional teams the means are 4.75, 3.0 and 4.20. At the team level, the conventional team’s scores are 5, 4 and 4 at time 1. At time 2, the conventional team’s scores reflect a downward trend in one of the teams (5 to 2) and stability for the other two teams. For the virtual team, the individual scores reflect an average of 3.5 and no change in the team score from time 1 to time 2 (5 at both reporting times).

One final snapshot item of the 34 included in the questionnaire assessed whether “this team keeps getting more effective all the time.” The data suggest that for two of the conventional teams’ individuals this is true (4.5 and 5.0). For the third conventional team’s



individuals, this is less so (3.60). The pattern for the time series for the conventional teams indicates a decrease in level of effectiveness for one of the conventional teams (4 to 3) from time 1 to time 2. For the other two conventional teams, the level remained the same (4 to 4 and 5 to 5). As for the virtual team, they reported an average of 4.0 as individuals. As a team, they report a high degree of satisfaction that remained constant from time 1 to time 2 (5 to 5).

Discussion

While there is considerably more to analyze, this first pass at the data does not yield appreciative or discernable differences between conventional and virtual teams in this class. Further analysis which closely examines the eight factors (which emerged from the factor analysis) and their relationship to virtual and conventional team structures may provide more insight as to similarities and differences among teams.

Most of these students resisted the virtual team structure. In fact, they created their own team structure that relied on significant and formalized face-to-face interaction throughout the semester. Their reliance on the technology of the classroom was limited to using it as a supporting vehicle for communication among the team members in the interim period between meetings. As for the virtual team in this class, they did not seem to report significant differences when contrasted with the conventional teams.

It is important to note that the four teams in the course performed comparably. There were no substantive differences in grades for the teams. There was no correlation between performance and team structure. There does appear to be some differences on the various “satisfaction” and “team performance” elements reflected in the Team Assessment Survey. Through more careful analysis of these data, we can begin to discern where there are differences based on team structure. Similarly, the qualitative data collected in the team reports may yet yield additional insight as to the motivation for structuring the team experience either along virtual or conventional lines.

In their team reports, three teams provided some insight as to what motivated them to avoid or abandon the virtual team structure. Issues of “trust” among team members, the ability to show “appreciation” for others’ ideas, and the ability to be “supportive” of ideas presented, were often cited reasons for the meetings. For one team in particular, they addressed the issue of “virtual teaming” head-on. For them it was an issue of effective communication. Another team, who met weekly, indicated that the technology (chat, email, etc.) was effective to summarize the face-to-face meetings and to keep members informed in the interim between their meetings. For another team, the use of the technology was seen as supplemental to face-to-face meetings.

Business schools seek to prepare individuals for effective career pursuits. Part of this preparation requires us to provide experiences that are consistent with organizational practices. Virtual teams certainly fall within this realm. It remains uncertain, however, how and when to deploy virtual teams in the classroom environment. More importantly, we need to understand why individuals resist virtual team formation, when given the choice.



For a virtual team to be effective, everyone on the team must be autonomous and self-reliant but still be able to work interdependently. It may be, as Glacel (1998) points out, that virtual teams “exist with great difficulty, if at all.” She suggests that a firm foundation of non-virtual face-to-face relationship building is an essential prerequisite for virtual teaming. This raises an important question: “at what point do individuals feel comfortable in transitioning to a virtual team?” In the current case, it appears that for most of these students, virtual teaming was not a preferred option. Students opted to establish a strong non-virtual set of relationships that transcended any attempt toward the development of virtual teaming. It may well be that for some individuals (perhaps many) that the demands of the high-tech requirements for virtual teams cannot be outweighed by the high-touch demands of face-to-face conventional teams.

Whatever the results of future investigations, it remains clear that organizations will continue to deploy the virtual team on the assumption of efficiencies and effectiveness. The lack of systematic empirical study of the role of virtual teams needs to be addressed. The reliance on anecdotal data is not a firm basis upon which to build organizational strategies and processes.



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Endnote

[\[1\]](#) The mission statement of the School of Business is as follows:

Our mission is to facilitate learning about business to prepare the diverse community of students whom we serve for successful careers and productive lives. Our greatest priority is to create a varied and responsive learning environment for our students. Through an emphasis on teamwork, communication, and problem solving skills, combined with an atmosphere of personal concern for the learning needs of each student, we provide academic challenge and individual support to enable each student to strive for personal and professional excellence.

High quality in our business programs is facilitated through the integration of liberal and professional curricula, the extensive use of information technology, and learning experiences beyond the classroom. Our educational programs are designed to support our students in gaining the knowledge and skills needed to enable them to become active in their communities, and ready for the personal and professional challenges of a rapidly changing global environment.

In all our programs and processes we maintain high quality through continuous improvement. In our undergraduate programs, the goal is preparation for entry to careers and graduate studies; in our graduate programs, the goal is career enhancement. Our part-time programs at both the undergraduate and graduate levels reflect our historical and continuing commitment to the educational needs of working adults.

We are committed to faculty scholarship with primary emphasis on instructional development and applied research. Service to the College and community is valued and encouraged as an essential responsibility of every member of the faculty.

We value all our stakeholders. Our students, alumni, the faculty and staff of the College, our trustees, and the business community are important partners in our mission. We view each of these groups as an invaluable resource in our continuing efforts to enhance the learning of our students.