

SHIFTING PARADIGMS IN MANAGEMENT EDUCATION: WHAT HAPPENS WHEN WE TAKE GROUPS SERIOUSLY?

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For 10 years, authoritative critics such as Derek Bok (1988) have been calling for a revolution in higher education, with new curricula that put less emphasis on transmittal of information to passive students and more emphasis on teaching methods that enable the students to actively construct their own knowledge and skills (Davis, 1996; Lempert, Xavier, & De Souza, 1995). Despite these calls to action, efforts to change the core technology of higher education have been sporadic, probably due to the relative isolation of teachers and administrators from market pressures (Miller, 1998).

In management programs, the functional toolkit can be communicated using traditional pedagogical methods (lectures, readings, and a few exercises), but absorption of conceptual tools is no guarantee that they can be used to solve problems because acquiring and using tools involve two very different cognitive processes that are facilitated by different teaching strategies (Baldwin & Ford, 1988). The challenge is to create opportunities for students to practice using concepts (Bonwell & Eison, 1991). In many business schools, problem-solving and analytical skills have traditionally been taught

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using the case method (Lundberg, as cited in Vance, 1993). Some MBA programs seek to focus on both conceptual knowledge and action skills (e.g., Adams & Mazzoleni, 1995; Davis & Hogarth, 1992; Kedia & Harveston, 1998). One way is by front loading core courses and combining later electives into team-taught interdisciplinary courses involving intensive student work on complex cases and cross-functional problems. Examples include Babson College (Schlesinger, 1996), Boston University (Young & Kram, 1996), U. of Denver (Gallos, 1996), and Bocconi University (Adams & Mazzoleni, 1995). Leadership skills have been more difficult to develop, but some believe that these can be nurtured through soft skills (e.g., via outdoor exercises) and group work (e.g., via field projects); see Hogarth and Ginzler (1993) and Adams and Mazzoleni (1995).

Restructuring the curriculum is useful because it can give students hands-on experience using toolkits to solve real problems and opportunities to practice leadership. In our opinion, such curriculum restructuring does not go far enough. The real world does not come in well-scripted and digestible 5- to 10-page bites from Harvard or Cranfield. The real world is messy, with incomplete and sometimes inaccurate data that make management like a search for a needle in a haystack. Giving students "cleaned" and "canned" cases instead of challenging them with the "messiness" of reality is consistent with early 20th-century pedagogical (i.e., teaching children) principles, instead of late 20th-century andragogical (adult-learning) theory (Cantor, 1992; Knowles, 1996; Renner, 1993; Rogers, 1989).

The andragogical perspective is in line with calls by Bok (1988), Bonwell and Eison (1991), Davis (1996), and leaders of the Organizational Behavior Teaching Society (e.g., Vance, 1993) for changes in teaching methods to enable adult learners to actively construct their own knowledge and skills. This perspective often involves students working together in groups, which offers two great advantages: First, groups facilitate creative problem solving by reframing the context—exploiting the diversity of functional and sectoral experience in most graduate classes; second, groups develop the relationship and team-working skills required for a successful career in modern organizations. Andragogy also involves innovative didactic methods because such methods create emotional involvement, motivation, and commitment among adult learners, who consequently learn more.

This article describes 2 years of experience with a full-immersion capstone MBA course designed according to andragogical principles, where participants spend 90% of their time working in teams solving complex multidisciplinary problems. The Turnaround Management course was approved in 1994 and delivered in 1997 and 1998 at Bocconi University in Milan, Italy. Our experience is relevant to this special issue because the entire course is

built on a *Lotus Notes* platform, and we are convinced that our didactic model would have been unfeasible without the advantages provided by groupware technology. After describing the program context, the didactic model, the course activities, and the centrality of information technology, we present the results of a questionnaire asking participants about their experience. We interpret that data with the aid of other documentary evidence and direct observation. Our goal is not to test any particular hypotheses but to describe and explain what happened from our point of view and that of the course participants, to encourage others to take bold steps to develop new didactic methods for the 21st century.

The Turnaround Management course was designed and implemented by 12 faculty members from five departments, plus consultants and technical experts (audio-visual, database, and local area network specialists). The faculty members were compensated for working a total of about 500 days over a two-year period to develop the course and cases. Bocconi invested more than \$250,000 to develop this course, not including investments in software and hardware upgrades (e.g., new servers, new work stations, and a fast ethernet instead of a token ring-based network).¹

The SDA Bocconi MBA Program and the Turnaround Management Course

The Bocconi University International MBA Program lasts 16 months from entrance (September 1) to graduation (mid-December). The program was redesigned in 1995, taking effect in 1996-1997 (Adams & Mazzoleni, 1995). MBA candidates have widely different educational and professional backgrounds and an average of 3 years of work experience. What makes the Bocconi MBA one of a few truly international programs is that only slightly more than half of the candidates come from the host country, Italy; during the last three editions, participants have come from 40 countries. Interactions among participants are real learning opportunities, so our teaching methods are designed to use participant diversity as a point of leverage. In addition to faculty and guest lectures and individual study, strong emphasis is given to group work (which includes formal assignments such as case preparation and presentations, role-plays and computer-based simulations, and informal tutoring).

Every candidate is expected to take personal responsibility for developing four types of attributes that we believe will make the difference between an extraordinary and a merely successful career—capabilities (knowledge and skills), attitudes (affirmative thinking, the desire to relate positively with

others, and a sense of ethical responsibility), listening skills (focused on both people and one's environment), and the habit of learning how to learn (the quest for knowledge, experience, and professional growth). These attributes are developed during the four phases of the MBA program, although with differing weights. In Phase 1 (Pillars) and Phase 2 (Functional Management), everyone attends all classes together in either the Italian or English classroom. This intense experience allows participants to assimilate basic concepts and values of management and to experience an intense and unique interchange with their colleagues and faculty members. Phase 3 (General Management) lasts 2 months and consists of a series of team-taught sessions based on interfunctional themes such as business process reengineering, with groups wrestling with complex and challenging cases. The Turnaround Management course occurs in the final 2 weeks of this phase, before the in-company field projects and elective courses.

Group work is such an important part of the Bocconi MBA experience that it deserves additional comment. Students are divided into groups of six to eight persons at the beginning of the program. The groups are carefully mixed to maximize heterogeneity of gender, nationality, and educational and functional backgrounds; they stay together for 3 or 4 months before being remixed. All professors who assign group work use these preassigned groups. During the Pillars phase, there are 5 full days of training in group dynamics and how to use the Bocconi peer-evaluation system to give anonymous bimonthly feedback to all members of one's work group. Faculty have no access to the peer data until the General Management phase, when it counts as part of course grades. By the time MBA candidates get to the Turnaround Management course, they have worked in three different groups and have received five or six cycles of peer feedback on their individual contribution to the team.

In Turnaround Management, our mandate was to achieve the following learning objectives by providing (a) a deep knowledge of the course content (the management of company turnarounds), (b) a challenging opportunity to apply conceptual knowledge acquired during the first half of the program to a real problem, (c) a chance to experience and exploit modern groupware technology and multimedia cases, and (d) opportunities to develop leadership skills.

THE DIDACTIC APPROACH UNDERLYING THE COURSE: THE BUSINESS NAVIGATOR MODEL

Given our objectives, a natural starting point seemed to be the principles of adult learning theory (see above discussion), as almost all of our students

were in their late 20s or 30s and had significant work experience. According to Angehrn, Doz, and Atherton (1993), the traditional case method of teaching creates a real business context in which theory can be applied to specific industries and organizations. The case method emphasizes the skills in a managers' toolkit (analysis, synthesis, diagnosis, problem solving, decision making, and communication).

Their Business Navigator model (see Figure 1) improves the case method on three fronts and incorporates some elements from business simulations. First, the content of the information changes: Whether bought off the shelf or written for that specific class, traditional cases rely on preselected and often predigested excerpts of information designed to communicate the key elements of the case in a limited time; in contrast, the Business Navigator model provides students with an abundance of raw information sources. Second, the learning style must change: Whereas traditional cases are read passively by the students, it is impossible for every student to read all the raw data, so students must work actively in teams to interpret the data and synthesize it into a coherent story, rather than reading a professor's synthesis. Third, the delivery mode changes from reliance on a single medium (the written case, with text and the occasional graphic), becoming interactive and multimedia.

We wanted students to be active in the construction of their own knowledge, so instead of presenting them with "predigested" cases of turnarounds, we decided to empower teams to use *Lotus Notes* to sift through mountains of raw data and write the cases themselves—reconstructing the company history and making recommendations for future strategic choices.² To develop leadership skills, we had to trust and empower student case team leaders to emerge and enact their visions of reality. This role reversal required instructors to fade into the background during the course but required much more advance preparation. Because adult learners retain more when emotionally involved, we designed the course with meaningful content, plenty of debating opportunities, and multimedia presentations. With the pressures of tight deadlines and complex tasks, and the use of high technology, participants were challenged to think, move, understand, and act in modern business environments that are diverse, socially complex, information intensive, competitive, and cooperative.

COURSE ACTIVITIES AND THE ROLE OF INFORMATION TECHNOLOGY

Turnaround Management is a mandatory course for all 114 full-time MBA students. It lasts 2 weeks, during which there are no other program activities, and is built around data from three major European businesses that

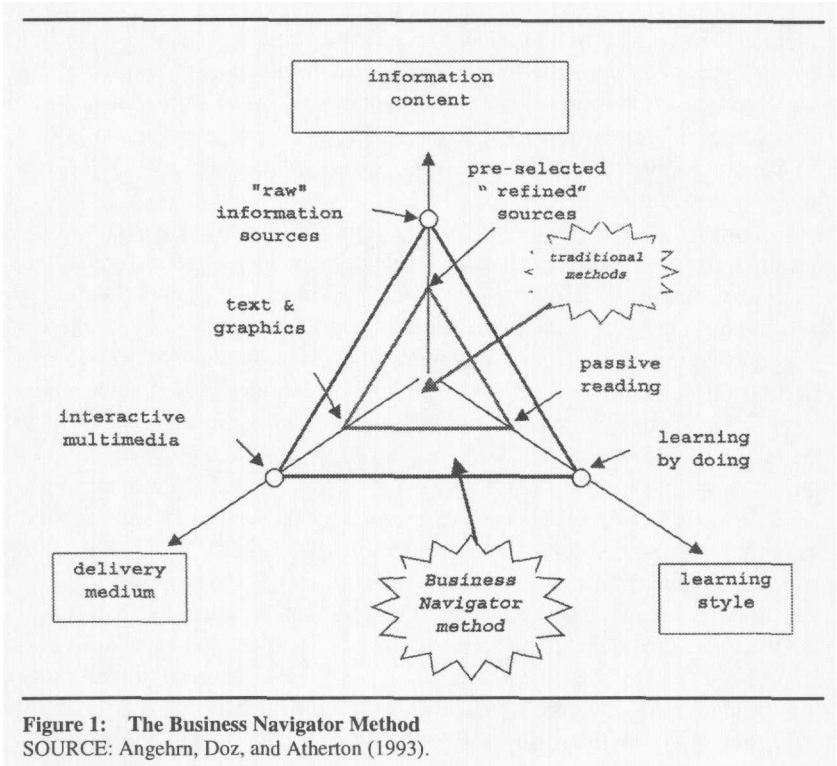


Figure 1: The Business Navigator Method
SOURCE: Angehrn, Doz, and Atherton (1993).

experienced dramatic changes in the 1990s: Pirelli (tires and cables), Banco Ambrosiano (commercial banking), and New Holland (agricultural equipment). Data from these three companies is stored in three *Lotus Notes* databases. A team of 35 students works on each case, and 9 students form a fourth team of consultants who serve the case teams by using the academic literature on management turnarounds. Each team has one classroom with a networked PC and videobeam and one reserved cubicle with a networked PC for every two members of the team.

Lotus Notes fulfills three key roles. First, the four *Case Materials* databases store the raw material gathered by the faculty during the design process. This raw data includes thousands of pages of internal documents (e.g., memoranda, audits, spreadsheets, organization charts) and external documents (e.g., press conferences, analysts' reports, transcripts from government hearings, and scholarly materials), plus about 12 hours of video for each case (e.g., speeches, interviews, and TV broadcasts). This material is made visible to participants on the *Case Materials* database as

new assignments are “published” on the *Course Work* database (see below). Case teams must sort, absorb, digest, and present the information. We suggest that they imagine themselves on a quest for the most relevant diamonds of information, after which they must polish and set those diamonds into a clear and coherent strategy for the firm, as required by the assignment.

Second, the four *Course Work* databases are the medium in which assignments are given, course work is done, and feedback is delivered. These databases function like electronic bulletin boards so that each team and the instructors can continuously track what is being created in real time. They are the main communication medium for all team members and faculty and accommodate many formats (Microsoft Word, PowerPoint, Excel, images, and video/audio). Individual students and subgroups of case teams respond to their parts of the assignments by creating and publishing their work on the database in the form of “works in progress” documents (to facilitate feedback). These documents become instantly visible to all student and faculty members of their case team. As the assignment deadline approaches, the leaders of a case team combine these documents into larger final documents, which are published as responses to the assignments (to be graded). The transparency of this groupware platform gives a sense of security to everyone that the students will not get too far out on tangents (even though faculty interventions have rarely been necessary).

Third, the *Participants* database is the space dedicated to group formation and coordination: Every case team finds it necessary to subdivide into smaller teams in order to process the data on the *Case Materials* database and publish the final document (answer) on the *Course Work* database. The *Participants* database enables both students and faculty to keep track of all the subteams set up by students during the 2-week course, thereby serving as a kind of internal directory of people and activities during the course and an archive of the organizational structure adopted by the case teams. Participants are also invited to contribute to a *Feedback* database dedicated to discussions on the learning process during the course.

During the first day, we explain the technical characteristics of the 10 databases and the course structure, requirements, and grading. After practicing on a sample database, students read a two-page abstract, a sample assignment, and a few representative documents and videos from each case; and then they must register online in the *Course Participants* database, joining one of the four case teams. Each faculty case team then “publishes” (i.e., makes visible to the students) the first assignment on its *Course Work* database, officially launching the course.

There are five or six assignments to complete in 2 weeks. Each assignment (see Appendix A) describes the scenario, the tasks to be accomplished, the

deadlines, and the time and place of any plenary sessions for presentation, dialogue, or debrief with faculty members. The assignments are cumulative, with each one building on the knowledge acquired from previous ones. Case teams must make presentations in plenary sessions aimed at checking their work and debating with instructors, and diffusing the knowledge throughout the case team and occasionally across case teams. The last assignment is the most comprehensive and may involve a detailed presentation of the situation at the end of the turnaround and a strategic plan for future relaunch of the company (including an implementation plan). Presentations and debrief of the final assignment are in front of top executives from the company or external financial analysts who specialize in the securities of the company.

Each case team is empowered with the resources needed to complete the assignments and is given complete operating autonomy. Responsibility for tasks is delegated by the team to subgroups and then redelegated to individuals; these individuals and subgroups are accountable to each other and to their own organizational structure—the faculty task team *never* micromanages the subgroups or individuals. The assignments are released about every 48 hours and are usually not delayed if student teams are late in publishing or presenting the previous assignment. Assignments are designed to be impossibly difficult for a small group of people to finish in the time allotted; so to produce good quality written output and presentations, each team must organize themselves to use all of their human resources effectively and efficiently. The physical proximity of students and faculty in the same building allows continuous coordination, but we have observed student teams using both face-to-face and virtual (groupware) coordination mechanisms.

Each case team “publishes” a series of final documents on the *Course Work* database, which are graded. The average of these counts for half the grade of every member of that student case team; the other half is the rating of that person’s individual contribution to the team (half of this individual rating is by faculty consensus, and the other half is given by the student’s peers). This system creates strong incentives at the group level but with a mechanism by which students can punish free riders.³

THE ROLE OF TECHNOLOGY IN A STUDENT-CENTERED COURSE

In addition to being one of our course-learning objectives, the use of groupware technology turned out to be an important facilitator of our andragogical approach for three reasons. First, the databases provided multimedia platforms for information on the three real turnaround cases, which theory says enhances knowledge retention because it captures the learner’s attention

(Alavi, 1994; Alavi, Wheeler, & Valacich, 1995). A total of 36 hours of digitized audio/visual material provided participants with insights about the companies that are difficult to absorb from written cases (e.g., dramatic TV news announcements during the Banco Ambrosiano crisis). This video was delivered via our dedicated video-on-demand server able to stream audio/video segments simultaneously to all 120 clients on the network. Second, groupware technology proved to be an effective and efficient tool to distribute a huge quantity of information and coordinate the work of large case teams under immense time pressure; we doubt that the course could be accomplished in a full-immersion format without the technology. Third, the open learning platform created by the groupware technology allowed even shy students to participate actively in the learning process, unlike in lectures or class debates. Bringing in shy students enhanced the quality of learning, as they often bring experience that is otherwise not available to the case team.

Discussion of Selected Results From a Survey of Participants

We next discuss what happened during the first two editions of Turn-around Management. As part of a larger research project on the effectiveness of the didactic model underlying the course, we collected data using two structured questionnaires, participant observation, and other available documentation such as student assignments and grades, including peer evaluations (Scarpanti, 1998).

We administered the same precourse and postcourse questionnaires in 1997 and 1998 (see Appendix B). The high response rate from both classes is probably due to the noncontroversial nature of the questions and the fact that although not anonymous, it was administered by a researcher who was not a member of the faculty teaching team and who did not share the data with the faculty team until after grades were assigned. The dominant reason for non-response was absence on the days the questionnaire was administered, and given the high response rate, systematic bias is unlikely. Due to space limits, we discuss only the most interesting items from the questionnaires. We also had access to quantitative data on attendance records, the grades of each team for each assignment, and the faculty and peer evaluations of each individual performance. Finally, the technology gave us a bird's-eye view of groups forming and dissolving and all students' work as it appeared on the databases.

In addition to the survey and archival data, we collected lots of participant observation data. Both authors found themselves at the core of the course design and delivery experience and thus admirably positioned to absorb a

rich flow of qualitative data from students and faculty members.⁴ Absorption was also facilitated by the course structure, which gave us physical presence at the work site but did not require us to concentrate on lecturing or leading discussions. Students offered plenty of verbal feedback as they experienced technical or organizational challenges.

We use this quantitative and qualitative data in exploratory, inductive, grounded theory mode (see Glaser & Strauss, 1967), not trying to prove a preexisting theory but, rather, to explore the data to discover relationships that can be used to construct hypotheses with other data sets.

PRECOURSE QUESTIONNAIRE: PRIOR EXPERIENCE

We administered a precourse questionnaire in 1997 and 1998 for the two editions of the Turnaround Management course, focusing on (a) the extent to which the students had worked in groups prior to entering the Bocconi MBA, and (b) their precourse experience with information technology (groupware and intranets).⁵

In response to Question 1, 9% of 187 respondents reported never having worked in groups in their previous jobs, 19% reported always having done so, and the remaining respondents were evenly split in the middle between occasionally and often. Interestingly, there were no big differences on this item between the 1997 and 1998 classes. In Question 2, students were asked about their pre-MBA work with groupware or intranets. We noticed some differences between the two classes: compared to the 1997 cohort, 14% more students in the 1998 cohort had at least some work experience using groupware or intranets. The percentage of constant users doubled from one year to the next (from 7% in 1997 to 14% in 1998), reflecting the diffusion of groupware/intranets in the corporate world.

POSTCOURSE QUESTIONNAIRE: HOW PARTICIPANTS EXPERIENCED THE COURSE

The first six tables present the percentage distributions for selected items from the survey of course participants, and Table 7 presents the correlations among most of these variables. Probably because the content and learning processes were identical, there were few differences in the annual subsamples, so we pooled all variables except the one measuring perceived group autonomy and responsibility (GAR).

Table 1 clearly shows that the vast majority of students perceived the didactic innovation in the course. As seen in Table 2, many reacted to the difficulties inherent in the role of active learner with greater emotional commitment and consequently greater work. This self-report data is also confirmed

TABLE 1
Selected Results of Survey of Course
Participants—1997 and 1998 (in percentages)

<i>Perceived Innovation</i>	<i>None</i>	<i>Little</i>	<i>High</i>	<i>Very High</i>
Perceived innovation, as measured by distance of Turnaround Management didactic approach from traditional approach	1	14	48	39

TABLE 2
Selected Results of Survey of Course
Participants—1997 and 1998 (in percentages)

<i>Course Involvement</i>	<i>Much Lower</i>	<i>Lower</i>	<i>Unchanged</i>	<i>Greater</i>	<i>Much Greater</i>
Involvement and work in course as a whole, compared to other courses	1	10	43	38	9

TABLE 3
Selected Results of Survey of Course
Participants—1997 and 1998 (in percentages)

<i>Group Autonomy and Responsibility (GAR) and Individual Autonomy and Responsibility (IAR)</i>	<i>Complete Disagreement</i>	<i>Moderate Disagreement</i>	<i>Moderate Agreement</i>	<i>Complete Agreement</i>
GAR: 1997	1	6	40	53
GAR: 1998	5	11	44	40
IAR	3	25	53	19

by faculty observations of the large amount of energy invested in the course by members of the case teams and the generally high quality of the written assignments produced by the various case teams.⁶

Although the vast majority of participants reported more motivation, we also investigated some reasons for the 11% of the cases reporting less involvement and work. The one student who reported much less course

TABLE 4
Selected Results of Survey of Course
Participants—1997 and 1998 (in percentages)

<i>Role Experience as Active Learner</i>	<i>Not</i>	<i>Modestly</i>	<i>Quite</i>	<i>Very</i>
Innovative	2	12	47	38
Stimulating	1	11	43	45
Satisfying	3	14	51	32
Difficult	20	33	41	7

TABLE 5
Selected Results of Survey of Course
Participants—1997 and 1998 (in percentages)

<i>Individual Outcomes Beyond Course Content Learning</i>	<i>Complete Disagreement</i>	<i>Moderate Disagreement</i>	<i>Moderate Agreement</i>	<i>Complete Agreement</i>
Learning of new skill in using information technology	7	11	40	42
Discovery of new personal talent	16	34	42	8
Development of the ability to teach what has been learned	5	21	58	16

TABLE 6
Selected Results of Survey of Course
Participants—1997 and 1998 (in percentages)

<i>Respondents Reporting That Groups Are Effective at These Activities</i>	<i>Precourse Opinion</i>	<i>Postcourse Opinion</i>	<i>Change During Course</i>
Brainstorming	89	94	+6
Problem setting	61	57	-7
Data analysis	19	40	+111
Problem solving	65	57	-12

involvement and work had experienced significant conflict with his group early in the course and effectively did as little as possible for the remainder of the course, receiving a low peer-evaluation rating. About half of the remaining students reporting less involvement and work were women, whereas

TABLE 7
Selected Intercorrelations From Survey of Participants

	1	2	3	4	5	6	7	8	9	10	11
1. Perceived course innovation	1.00										
2. Course involvement (relative)	0.13	1.00									
3. Group autonomy & responsibility	0.06	0.11	1.00								
4. Individual autonomy and responsibility	-0.09	0.11	0.32*	1.00							
5. Perception of role innovation	0.26*	0.21*	0.06	0.02	1.00						
6. Perception of role stimulation	0.16	0.32*	0.19*	0.00	0.38*	1.00					
7. Perception of role satisfaction	0.10	0.33*	0.08	-0.07	0.35*	0.57*	1.00				
8. Perception of role difficulty	0.21*	-0.07	0.01	-0.03	0.18	0.17	0.17	1.00			
9. New information technology skill	0.20*	0.00	0.08	0.04	0.20*	0.15	0.08	0.06	1.00		
10. Discovery of new personal talent	0.19	0.29*	0.16	0.26*	0.20*	0.16	0.25*	0.14	0.11	1.00	
11. Development of teaching ability	0.12	0.18	0.09	0.10	0.29*	0.28*	0.35*	0.12	0.28*	0.33*	1.00

*Significant at .01 level.

women formed only about 20% of the course participants. Prior to the course, these women had been concentrated in the international classroom (with an Anglo-Nordic cultural majority), but once dispersed amid the four case teams, it is possible that they found themselves marginalized in case teams dominated by men, the majority of whom were from Mediterranean cultures. Based on direct observation, we can state that a number of others who reported less involvement and work were free riders who were not afraid to admit this in a questionnaire that would not be seen by faculty members until after they had received their grades.

As shown in Table 3, about 90% of students perceived the high levels of autonomy and responsibility delegated to their groups, and 75% perceived the high levels of autonomy and responsibility delegated to them as individuals. The high-group autonomy perceived by the participants is largely determined by the choice that the faculty design team made in structuring and executing the course—the choice to empower students and groups to the maximum was hotly debated at the time but has worked well. The course structure and the tight scheduling of assignments amplified the need to get work done autonomously, both at the individual level and group level, as the only way to analyze data and contribute to the online debate. In several circumstances, we noted the heated atmosphere due to tight deadlines for publication of a final document on the database. We speculate that some of the differences in perceived group autonomy between the two course years are due to the fact that in 1998, we more clearly predefined the activities of the Consulting Theorists group (9 participants) to ensure better integration with the other case teams.

Surprisingly, the correlations among these items (innovation, involvement, and autonomy) turned out to be mostly nonsignificant. The one exception is that between group autonomy and individual autonomy, which provides evidence that they are not incompatible design choices. Overall however, we can confidently assert that our andragogical approach to the course was perceived by the students as creating an innovative and empowering experience. According to andragogical theory, this should motivate adult learners; in fact, we observed that many participants were curious and sometimes even impatient to see what was still to be released in the *Case Material* databases. These data are also consistent with the quantitative and qualitative data collected from participants at the end of the course through the formal and anonymous course evaluation system. The very positive reaction to the course design should give great comfort to proponents of andragogical approaches who may worry that taking risks on very innovative course designs may result in mediocre or poor course evaluations.

Table 4 shows how participants perceived their experience in the role of active learner. Although the vast majority perceived their roles as quite or very innovative, stimulating, and satisfying, only half perceived their roles as quite or very difficult.⁷ The strong or moderate correlations among these four variables and the strong correlations between three of these variables and course involvement support the claims in the andragogical literature (Knowles, 1996; Rogers, 1989) that adult learners are more motivated under such conditions. The nonsignificant but negative correlation between role difficulty and course involvement is likely due to the lack of linearity of this relationship. Because difficult roles can turn out to be frustrating (a negative interpretation) or challenging (a positive interpretation), we suspect that the true relationship between course involvement and role difficulty is curvilinear, with greatest involvement at moderate levels of difficulty. Given the diversity of backgrounds, cross-cultural factors may also explain some of the variance in role difficulty or the way in which role difficulty was interpreted by participants.

Three items on the questionnaire asked respondents to report the extent to which the course enabled them to discover or develop new skills or talents beyond the content of the course (see Table 5). The discovery of new talent is interesting because according to andragogical theory, it will most likely augment the participant's enthusiasm for the subject matter and ignite an emotional desire for more learning in this mode. Examples of new talent discovery include the following: the ability to prepare a multimedia/animated-based MS PowerPoint presentation, the ability to work in a pure bilingual environment acting as a *trait d'union* among different groups, and the ability to make decisions under pressure, with results due in a matter of hours. About three quarters of students reported acquiring new skills in using the *Lotus Notes* technology or teaching others what they had learned, while half reported discovery of unspecified new personal talent.

For most students with limited experience using *Lotus Notes*, this was the first time that they had been forced to work intensively using groupware technology, which they reported (in both the formal course evaluations and informal remarks to the authors) added real value to their MBA experience. The acquisition of information technology (IT) skills variable was correlated with variables for course and role innovativeness, suggesting that the heavy reliance of IT was an important reason why some students perceived the role and course as innovative. The correlation of the IT skills variable with the development of teaching skills supports the authors' observation that an important part of the cross-learning that went on within small groups concerned effective and efficient ways to use *Lotus Notes*.

In addition to being correlated with the acquisition of IT skills, the variable about the development of new teaching skills was correlated with the more generic "discovery of new personal talents" variable, as well as three of the four role variables—role innovation, stimulation, and satisfaction. We hope that these correlations are not surprising to our readership in the management education community! Not surprisingly, development of teaching skills was not correlated with role difficulty; it seems less probable that participants experiencing role difficulty would discover as many opportunities to teach others.

The discovery of new personal talents was moderately correlated with role innovation and satisfaction, which suggests that such opportunities are rare and appreciated among MBA students. The correlations between the discovery of new personal talent and the course involvement and individual autonomy variables probably reflect bidirectional causality. Putting these correlations together in a feedback loop, we suspect that the high levels of involvement and individual autonomy probably create opportunities to discover new personal talent and that the resulting feelings of stimulation and satisfaction may further increase course involvement and the sense of individual autonomy.

Given the increasing amount of work performed in teams throughout the Bocconi MBA program, we were curious to know whether a capstone course that was almost totally based on team work but facilitated with modern information technology (i.e., groupware) would change participants' beliefs about the effectiveness of groups. Table 6 shows that the experience doubled the number of participants who reported that groups are effective in data analysis, with more modest changes for the other activities. We speculate that this is due to the deliberately high volume of data that had to be analyzed in the course, which made it nearly impossible for data analysis to be done in one person's head—so students had to learn how to analyze data well in groups, thus proving the old adage that necessity is the mother of invention. The reduced belief in the effectiveness of problem solving is also not surprising, given the large case teams and the absence of an externally sanctioned leadership structure.

Conclusions

Although we should obviously be careful in drawing conclusions from one study of one course design, the data here is remarkably coherent and consistent and provides strong support for the andragogical didactic model, in

general, and the Business Navigator model, in particular. The latter is characterized by an almost complete role reversal between teachers and students, putting the latter in the driver's seat and requiring teams of students to teach each other based on their particular talents and experience. Overall, the findings for both structural and attitudinal variables confirm that participants in the Turnaround Management course played an active role in their own learning at both the individual and group level. The strong intercorrelations among the three individual role variables discussed above (role innovativeness, role stimulation, and role satisfaction) and course involvement provide strong support for the claims in the theoretical literature that individuals are more motivated and learn more when they work in groups, thereby explaining the synergy that is often created by groups.

We observed that greater delegation of autonomy and responsibility to student case teams creates opportunities for teaching and learning among groups of students. Individual subgroups of students are required to explain and defend their use of a particular theory in solving a problem that the case team has assigned to them. In integrating the work of the separate subgroups into a coherent response to a complex assignment, the students are forced to negotiate to convince the other subgroups to adopt their proposed solutions. The benefits from this role reversal may be a reason to question the assumption that MBA students should not be given teaching experience like many Ph.D. candidates are. Explaining one's ideas under time pressure to a critical audience of peers forces one to sharpen and hone the ideas as well as communication skills. Both are important in the business world, and we hope that such andragogical models of learning become diffused in the management education community.

Given that the extreme reliance on group work is a key element characterizing the didactic structure of the Turnaround Management course, these data provide powerful evidence of the general effectiveness of the andragogical philosophy and the specific effectiveness of the Business Navigator model underlying the Turnaround Management course.

However, a word of caution is appropriate here: Cross-cultural and specific institutional factors are probably key factors in our findings. The Bocconi MBA experience is intended to bring different cultures together in a common learning "playground," thus surfacing differences rather than homogenizing them. By the time our candidates begin the course, they have had intense training and experience in teamwork and have at least some experience as users of *Lotus Notes*. All are bilingual, and more than half are multilingual and have extensive experience working in very heterogeneous teams.

It remains to be seen how important these cultural and institutional factors are for the success of similar initiatives.

We learned a lot during the 4-year experience of designing and delivering this course. We had to apply theories of course design in a very complex institutional and program context. We built a consensus on the course structure and rules among a dozen faculty members from five departments. We used all of our political skills to continuously sell the project to people controlling key human, financial, and technological resources. We learned to work effectively with the consultants who designed the course software. We learned to manage technical difficulties, which meant adjusting student activities and deadlines in midstream. All that said, knowing what we do now, we would both repeat the experience in a heartbeat.

We hope that readers have increased their appreciation of the importance of integrating 21st-century technology into the classroom in a way that goes beyond the gee-whiz aspects. We hope to stimulate educators to deeply rethink the value that can be added by teachers of management. If management education is going to keep up with the pace of change in the business world, we must move toward more andragogical teaching techniques such as hands-on use of rich multimedia cases by teams of students. This article is *not* intended as a definitive statement on the role that technology can play in shifting from a pedagogical to an andragogical paradigm. By sharing one particularly exciting and rich experience, we open a dialogue with management educators about the opportunities for and limits to integrating information technology into the core technology of learning. We hope that our 4-year journey can inspire others to embark on similar adventures.

Appendix A

Sample Assignment for Pirelli Case Team

Assignment n. 4	Title: Prepare to meet your Gekko!
Assigned to: Pirelli Case Team	Submission date: 24/07/98
Plenary session	day: 24/07/98 hour: 12:00 place: R03

Description:

Imagine that you are Leopoldo Pirelli and his top management team preparing to meet the shareholders at the meeting called for the end of 1991.

- a. Prepare a letter to the shareholders to explain the reasons for the strategic choices of the Continental affair. It must be convincing, as your jobs are all on the line! (not to mention your MBA course grades). This letter must be formally prepared in a document, in English, and put on this database before 10:30 on July 24.
- b. At the same time, you should get ready to simulate the actual shareholders meeting with a "live" online discussion forum at 11:00, Friday, July 24. (Hint: to prepare for this role, see Gordon Gekko's speech to shareholders in the popular film *Wall Street*). You will be evaluated on how well you respond to the shareholders' queries.

NOTE: Most assignments are longer (2-3 pages of explanation) and require considerably more time and work (e.g., 30 PowerPoint slides) than this one, which is included because it gives the live-action flavor concisely.

Appendix B

Sampling Data

	<i>Number of Participants</i>	<i>Number of Respondents</i>	<i>Response Rate (%)</i>
1997 precourse	124	99	80
1997 postcourse	124	111	90
1998 precourse	110	88	80
1998 postcourse	110	101	92

Notes

1. Although we recognize that replication of our experience may be difficult for most readers due to the massive resources required, we believe that those who work in schools with more lim-

ited resources may find our experience useful when planning smaller scale innovations in course design.

2. The sources and media of these data are discussed later in this article.

3. This was subject of many heated discussions among the faculty design but has worked remarkably well, and there has been little variance between the individual ratings given by the faculty and the average peer evaluations. Although the grades exhibited the usual amount of variance, we have had relatively few complaints about the grading system—and mostly from students who had received low grades from peers!

4. The second author was project director responsible for the design, development, and implementation of the Turnaround Management course. The first author worked on the didactic model of the course and one of the case development teams.

5. There was also a question on participants' beliefs about what activities are effectively conducted in groups, but this will be discussed in relation to the postcourse questionnaire.

6. The quality of course assignments was not universally high, but early quality problems were due to the students' need to learn how to organize themselves better in their new environment as well as uncertainty about how to effectively and efficiently use the groupware technology. We deliberately refrained from giving them much counseling, although we did answer most specific questions. This strategy paid off, as the quality of the assignments steadily improved during both editions of the course and reached a peak during the final assignment that was presented to external consultants, financial analysts, or executives from the company being analyzed.

7. The very small numbers of participants who experienced the role as *not* innovative, stimulating, or satisfying were mostly those who were observed by the faculty as having a great deal of difficulty working in small groups. For those who had been experiencing discomfort with group work from the beginning of the MBA program, an intensification of the program emphasis on group work was not surprisingly interpreted negatively.

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