

The Integrated and Interactive MIS Classroom: Using Meeting and Presentation Software to Create an Active Learning Environment

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ABSTRACT: *This paper describes the use of two software tools - Visionquest and Harvard Graphics - to help create an active learning environment. This approach, which I will call the IIC (for Integrated and Interactive Classroom) approach, attempts to create an environment where MIS students work in teams, provide feedback to the instructor, and present a term project to the rest of the class. Visionquest automates many functions of a meeting while Harvard Graphics is a presentation tool. The IIC approach uses these packages as a tool to support and improve the active learning strategy of a cooperative student project. By making use of widely available software tools, the teaching methods described here are readily transferable. This makes the IIC approach applicable to a wide audience.*

KEYWORDS: *MIS Education, Active Learning, Group Decision Support Systems*

INTRODUCTION

The content of the MIS core course typically involves introducing students to hardware and software, databases and telecommunications, transaction processing and decision support, life cycle and prototyping systems development, information ethics and computer security. Each of these topics can be truly interesting. Add artificial intelligence and virtual reality and we have material that is the stuff of science fiction movies and books. Yet, when we (MIS instructors) have actually "taught" the course, we find students lethargic and overwhelmed by the key terms and jargon. It is truly frustrating to observe how little they remember of our best analogies and war stories. The computer labs used to be fun until we found that each semester more of our students already knew how to delete blocks of text and create macros.

To deal with these problems, I decided to introduce an active learning component into the MIS course. The approach applies the learning strategies of small groups and cooperative work to the core MIS course. It also introduces timely feedback, a key principle of Total Quality Management (TQM), into the course. These strategies are facilitated by using the new teaching technologies of electronic meeting systems and presentation software.

This paper describes the use of two software tools - Visionquest and Harvard Graphics - to help create an active learning environment. This approach, which I will call the IIC (for Integrated and Interactive Classroom) approach, attempts to create an environment where MIS students work in

teams, provide feedback to the instructor, and present a term project to the rest of the class. Visionquest (from Intellect Corporation) is a group decision support system (GDSS) that automates many functions of a meeting including brainstorming, voting, ranking, and scoring functions. Harvard Graphics (Software Publishing Co.) is a presentation tool that can be used to create and display a variety of charts including bullet, pie, organization, and freestyle charts. The IIC approach uses Visionquest as a tool to support and improve the active learning strategy of a cooperative student project [10]. It also uses Visionquest to obtain feedback in a timely manner from the students. Harvard Graphics is used to support student presentations of their project. It also helps improve their communication skills.

LITERATURE REVIEW

The dominant learning strategy used in the introductory Management Information Systems (MIS) course still appears to be the lecture method. Research from learning theorists demonstrates that this "empty vessel" approach to learning is simply not very effective. This approach views students as empty vessels which are filled up with knowledge by passively listening to those founts of wisdom, the instructors. Meyers and Jones [10] cite studies that found that students retain only 20% of the information provided during the last 10 minutes of a lecture, that students are not paying attention to the lecture 40% of the time, and, most disturbing of all, that 4 months after taking a course students knew only 8% more than a control group that never took the course. An alternative approach called active learning is beginning to be adopted by instructors. The key assumptions of this approach are that learning is active rather than passive and that each student has his or her own learning style.

Experiential Learning Theory

The active learning approach appears to provide a more effective learning strategy. This concept is not restricted to educational institutions. Most corporations "re-engineered" their businesses by empowering their employees. Similarly, students become the "architects of their own learning" [3,15]. The underpinning of this approach is experiential learning theory. According to this theory [6], there are four learning styles that people use. These are the convergent, divergent, assimilative, and accommodative styles. The convergent style involves grasping abstract concepts through comprehension and transforming these concepts through experimentation (an

experimental scientist, for example). The divergent style involves grasping concrete life experiences by apprehension and transforming them through reflection (eg. an expressionist artist). The assimilative style involves comprehending abstract concepts and transforming them through reflection (eg. a mathematician). Finally, the accommodative style involves apprehending concrete experiences and transforming them through experimentation (eg. an auto mechanic tinkering with a carburetor). Through nature or nurture, individuals tend to favor one of these learning styles and, if the individual chooses a career where that style dominates, specialization tends to further reinforce one learning style. However, true human development requires individuals to develop an integrated learning

ments, learning strategies, and teaching resources. The key elements are talking and listening, writing, reading, and reflecting. Students do not passively receive knowledge but must actively construct their own frameworks. Each student has a preferred learning style that involves using some combination of reflection, talking, listening, reading, and writing that works together to add to and refine his or her knowledge structures. Active learning strategies attempt to provide an environment in which students have some flexibility to direct their own knowledge acquisition and can combine more than one learning element to suit their learning style. Learning strategies include small groups, cooperative work, case studies, simulations, discussion teaching, problem solving, and journal writing. Teaching re-

methods do not substantially overlap with mine.

DISCUSSION OF THE INTEGRATED AND INTERACTIVE CLASSROOM (IIC) APPROACH

The centerpiece of this approach is the cooperative student project. Teams of three or four students are formed early in the semester to carry out this project. The project consists of researching a specific area of MIS and presenting the research findings or the system developed to the rest of the class. In the process of carrying out this assignment, I believe that students learn a lot about MIS, acquire new computer skills, and improve their communication, creativity, learning, and group skills.

Setting the Stage

There are a few procedures used to help manage the approach effectively. First, I make sure the students know what to expect by providing them with a detailed course syllabus. This syllabus clearly describes the objectives of the course, grading policies, classroom procedures, and a tentative class schedule. It fulfills the requirements specified by active learning theorists [10]. I allow students to join any group. However, to provide some control over the group processes, if the majority of a group complains about any member, that person must complete the project individually. Students recognize that their success depends partly on maintaining a good working relationship with their team mates. To provide students with some background on Visionquest, we give them a copy of a Fortune article [5] on GDSS.

Selecting a Topic

Teams select a topic of their own choice. They could analyze an existing information system, design and/or develop a new system, compare various software packages or hardware devices, or research a topical area. The objective here is to promote self-directed learning and creative choices. In the past this step often ran into a number of difficulties. More aggressive students tended to force their choice on others in the team. Some teams would wait till the last possible moment and pick a topic randomly from the textbook. Most teams would generate only one or two topic choices. In fact, a number of teams would pick the same topic, usually something that was discussed recently in class. The IIC approach attempts to improve this process by using Visionquest, an electronic meeting system. Visionquest provides a brainstorming tool called Brainwriting that helps teams generate a large number of possible topics. All the team members contribute topic ideas and this interaction tends to stimulate many new com-

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approach that uses all four styles. The theory also suggests that creativity is the result of tensions generated by using multiple styles.

The theory has many implications for business schools. First, our student bodies are increasingly diverse and their learning styles are very likely to be proportionately diverse since age, gender, and culture factors often affect the learning styles used. It would appear that, to effectively meet their needs, these students must be offered more than one learning method. Second, if a key objective of education is to produce well-rounded, fully developed individuals, it is important to help students become integrated learners. Third, the marketplace demands creative and adaptive employees and this appears to also require an integrated learning style.

Active Learning Practices

A large number of practical tools and strategies are being developed to create an environment where students can use more than one learning style and can actively pursue knowledge rather than passively receive it. Meyers and Jones [10] describe the structure of active learning as being composed of ele-

sources include readings, homework assignments, outside speakers, teaching technology, and television.

Applying technology to support feedback has been adopted by other educators. Strasser [12] discusses the use of E-Mail to improve communication between student and instructor. It does not address group processes such as brainstorming and voting however, which are more effective when the object is to evaluate the course. Love and McKean [7] describe a real-time student feedback system where students can request a number of actions from the instructor. These actions include speaking faster or slower, using less technical language or summarizing, and so on. Students record their requests by pressing a particular key. This system appears to be somewhat intrusive. The authors themselves admit that a number of issues need to be resolved before the system can be widely adopted. Also, the system focuses on supporting the lecture method. The IIC approach, on the other hand, supports the cooperative project method. Finally, I am aware of some ongoing studies using group support systems to improve case analysis or systems analysis. Once again, their objectives and

binations and refinements. Visionquest also provides ranking and scoring tools that allow team members to select a topic in a democratic and scientific manner. At the end of this exercise, students have also been exposed to a key business application - the group decision support system (GDSS). They will learn about this application not only by grasping the concept but also through concrete experience and active experimentation.

The topic selection exercise consists of a three step agenda. In step one, team members brainstorm for topics. As they key in their ideas, other members' contributions appear on their screen. This triggers the generation of new ideas. In step two, each member ranks the list of alternatives from best to worst. They then submit their ranks for group averages to be calculated. Visionquest does this calculation in a few seconds and reports the averages to the team. In step three, the top five topics are scored using a multi-criterion system. The criteria include relevance, usefulness, audience interest, and feasibility. The topic must be relevant to the course, must be useful to the team members, should be of interest to the rest of the class, and should be feasible in terms of resources. The topic which receives the highest average score becomes the team's selection. If more than one team picks a topic, there are still four other choices to pick from. It is often useful to stress that topics should be connected to their own interests, both personal and professional (Shack, 1993).

Getting Student Feedback

One Visionquest session is devoted to obtaining feedback from students on the course itself and on the instructor's performance. This session accomplishes several objectives. First, it provides valuable feedback on our performance and does it in real-time. We can actually address student complaints or suggestions in the current semester. The information is also well organized which cuts down on clerical chores. Other methods for obtaining timely feedback are of course available but either do not offer the benefits of group interaction or are too intrusive ([7] for instance). Second, it sets a tone encouraging constructive criticism in the classroom which is important for the later stages of the project. Students will be required to identify problems with their own team and also grade the presentations of other teams.

In the second Visionquest exercise, the whole class is asked to provide feedback on the course itself. Students are asked to come up with suggestions for improving the course. Once again brainwriting is the tool used to support this activity. To keep the list manage-

able, the class is split into groups of ten students. The suggestions are then ranked from best to worst. Finally, the group votes "Yes", "No", or "Abstain" on which of the top ten suggestions should be implemented.

Once the topic has been approved by the instructor, it is important that the teams' progress be monitored. As with any group project, problems such as procrastination and loafing have been encountered. Once again, I have used Visionquest to counter these problems. The objective of this exercise is to evaluate the progress of the teams on their project and to generate solutions to the problems they are encountering. In this session with Visionquest, students are expected to brainstorm for ideas on improving their presentations and to evaluate their progress by responding to two questions - "What do we need to change in order to do a better job in the weeks ahead?" and "Is everyone contributing their share to the group?" [4].

Presenting the Project

The final stage of the project involves presenting the project to the class. Any student or professor who has been forced to listen to a dull presentation will tell you that a visit to the dentist is often less painful. The presenter reads off a piece of paper, rarely venturing to make eye contact with his or her captive, but not captivated, audience. When the ordeal is finally over, the victims of this perceived verbal abuse collectively offer up a sigh of relief. The presenter, too, spends days and sleepless nights preparing for the fateful event. He/she looks out into a sea of hostile faces and begins to spew out every statistic and piece of arcane jargon, without actually looking at the audience or coming up for air.

Despite the discomfort that presentations cause, they are an important pedagogical tool and learning experience. The sharing of experiences among students can also be a very effective means of learning. As noted earlier, talking and listening are two of the basic elements of active learning. Communication skills, greatly in demand by prospective employers, can be enhanced by watching and participating in these presentations. How, then, can we make them less distressing for all parties? I have used a presentation package called Harvard Graphics to help address this dilemma. Harvard Graphics is a program that can be used to create a variety of charts. Bullet charts, pie charts, bar charts, freestyle charts, organization charts, flow charts, even animation charts - Harvard Graphics makes them all in glorious technicolor. Best of all, these charts can be strung together to form a complete presentation and projected onto a large

screen. Teams presenting their project now have an impressive visual aid to help enhance the experience. Also, as with Visionquest, students learn to use an important computer package in the process.

The University has a number of multi-media rooms which contain, at minimum, a PC and a projection screen. The PCs are part of a local-area network (LAN) and have access to a wide variety of software including presentation software. Harvard Graphics is one such presentation software package that is available on the network. I allocate approximately one and a half hours of class time to conducting a tutorial on the software. This consists of building a sample presentation by creating a variety of charts and linking them together. I then get them to create a similar presentation of their own and to give us a printed copy of the charts. They usually get about 5% of their overall grade for completing this assignment. Every chart of each student must be unique - this results in very creative, and occasionally disturbing, output! After successfully completing this assignment, most students become comfortable with the software and will begin to offer us lessons.

At the end of the semester, teams of students present their term projects to the rest of the class. Harvard Graphics must be used in these presentations. The presentations are usually about twenty minutes long and attendance is compulsory. The rest of the class is expected to take notes on each presentation since they are included as material for the final exam. The audience grades the presentation as well and the average audience score counts for 20% of the project grade. The teams must also turn in a one-page summary or outline of their presentation.

RESULTS

As with most instructional approaches, it is difficult to measure precisely the effectiveness of our method. To conduct a scientific experiment, there would have to be a control group which would be excluded from using this teaching approach. For ethical and practical reasons, this was not possible. I must therefore rely on anecdotal evidence to support my claims. The University will soon administer a comprehensive exam at the end of the undergraduate program. The exam will contain questions from all core courses including MIS. I hope to carry out a study to track the performance of students in that exam. In this way, I will be able to validate the efficacy of the IIC method more scientifically.

I find that students are more enthusiastic about the course, make better presentations, and occasionally make helpful suggestions

that improve the class. I submit that this approach also promotes cooperation, creativity, and adaptability skills that are so important to the workplace today. By exposing students to a variety of learning strategies, this approach allows a diverse student body alternative paths to knowledge acquisition while promoting a more integrated learning style. Finally, the tools themselves update the traditional skills component by replacing Lotus 1-2-3 and WordPerfect.

Generating Enthusiasm

Students have consistently rated the term project and computer labs as being the most useful and enjoyable parts of the course. They have used Harvard Graphics in other courses and pressured other faculty to use the multi-media rooms. After they become comfortable with Visionquest, students will often stay on after the class to complete a session. This is in stark contrast to their behavior at the end of a lecture!

Improving Presentations

Even though most students dislike making presentations, they recognize the importance of communication skills and feel that they have improved their own skills through this project. The reluctant presenter is now armed with powerful weapons. First, all those eyes are now focused on the screen instead of being trained on his or her jugular. Second, he/she cannot easily forget his/her lines or lose his/her place since each letter is almost a foot high. Third, the audience, raised on MTV, responds more favorably to visual media, especially graphics and animation. Fourth, the process of creating the charts have helped organize his or her thoughts and rehearsed him/her. In the near future, the possibilities will be even greater. True multimedia capabilities such as video and sound can now be added to presentations through the use of multimedia authoring packages and CD-ROM technology. Just as with active learning approaches, it seems that elementary schools are at the cutting edge of this "learning revolution" [2].

Stimulating Feedback

Feedback is a critical component of any quality initiative [13]. Feedback from students, however, is unfortunately overlooked. Student evaluations are usually collected at the end of the semester when there is little motivation to make suggestions. Criticism is often muted since the critic's handwriting may give him or her away. Very often, the time provided for filling out the forms is limited. The IIC method uses Visionquest to collect feedback from students in the middle of

the semester when their suggestions can still be implemented. Since we devote an entire class period to this session, there is also more time to seriously evaluate the course. My experience has been that students generate many more suggestions, are more honest, and are more positive towards the course and instructor.

Supporting Group Dynamics

Cooperative student projects improve social skills and prepare students for the real world [1,9,10]. Most students have been exposed to team projects in a number of courses and are increasingly comfortable with the format. Once they understand that they can "fire" a team member for not contributing and that they can also evaluate each others performance, they feel more in control. These procedures also tend to keep potential free riders in line. The biggest contribution of the IIC approach in this regard is the creation of a more democratic process for selecting topics. Less aggressive students, who are usually dominated by team members, now have an equal say in topic selection. They are also more likely to "speak out" about perceived problems with the team's progress. Students also participate in an important creativity exercise when they brainstorm for ideas.

Updating Computer Skills


Students learn to use Harvard Graphics and Visionquest instead of revisiting standard packages like WordPerfect and Lotus. Harvard Graphics is not the only presentation software available - Microsoft's Powerpoint and Aldus's Persuasion are just two of the many alternatives to HG. It is, however, currently widely used in the business world. Groupware is widely recognized as an extremely valuable productivity tool [5]. Meetings take a small fraction of the time they used to. Also, anonymity offers the benefits of a more participative and honest discussion. Clerical chores are reduced since the feedback is already organized and student votes can be rapidly tallied. Once again, Visionquest is not the only groupware choice available. Lotus's Notes program is now practically an industry standard. TeamFocus is yet another GDSS package. Since the University had a grant from Collaborative technologies that allowed us to use Visionquest free of charge, we have naturally adopted this package. Also, Visionquest does not require any special hardware to run.

Possible Problems

There are a few drawbacks and caveats to using this method. First, obtaining multimedia rooms and computer labs are not always feasible. Perhaps, one day, every classroom will

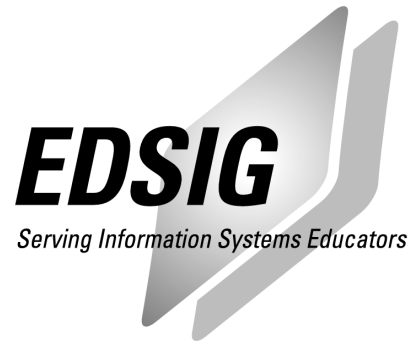
have a computer and screen instead of an overhead projector and every student will carry his or her own laptop. A short term solution could be for the multi-media center to provide a mobile setup on request much as they now deliver TVs and VCRs. Computers that attach to overhead projectors are also available and seem to offer an attractive alternative. Second, as with any technology, the potential for breakdowns exists. We have all occasionally been in situations where the projector didn't work properly or the whole system went down. Third, some students are still uncomfortable with computers and may press the wrong keys causing confusion and time delays during their presentations. It is critical to have all presenters do a dry run before their presentation. Fourth, some students get so caught up in trying to make dazzling charts, they err excessively on the side of style over substance. Fifth, true anonymity is difficult when students sit next to each other in a lab. It is advisable to separate group members so that they cannot see each other's screens. Finally, there is the "problem of large numbers." Most MIS classes I have taught have about 35-40 students and this is a manageable number. However, with very large classes, the only way to implement this approach would be to split the class into smaller "labs" and perhaps use teaching assistants as facilitators in some of these labs.

CONCLUSION

College faculty, faced with a diverse student body and changing job requirements, are realizing that reliance on lectures alone will not accomplish their pedagogical obligations. Active learning strategies are finally being implemented in college classrooms. However, information technology is only beginning to be widely explored as a teaching resource. I believe that IT is a powerful tool that should be used to support active learning strategies. In this paper, I have described how I use Visionquest and Harvard Graphics to support a cooperative student project in the core MIS course. Information Technology itself is a key topic in the course and so is naturally a very appropriate medium for instruction. Students learn about computer technology by using computers. However, I have also used this approach in organizational behavior courses and capstone strategic management courses at both undergraduate and graduate levels. 

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STATEMENT OF PEER REVIEW INTEGRITY

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