

The Interactive Classroom

The Newsletter for Interactive Classroom Teaching and Learning • Spring 1999

Classtalk Grows Up!

Spring '99 marks the third anniversary of the delivery of the very first production Classtalk system, and now we can definitely say that Classtalk has grown up. There are two signs that I would like to point to, that show this to be true. First, we have had only one call this semester to report a system crash or software bug. Second, the pedagogy is catching up with the software and there are now many users actively teaching with some of the advanced features that were designed and built into the system.

There are also other signs. So much of our early experience & reputation came from Physics taught in large lecture halls by the Eric Mazur's of the world, that the revolution in smaller classrooms has slipped by almost unnoticed. There are some important distinctions to make between teaching in smaller classrooms and facing a class of 250 to 500 students, and these differences are reflected in the pedagogy. For example, did you know that,

- we have some users who almost never use multiple-choice questions,
- that some teachers don't focus on whether student's answers are "right" or "wrong", but on the thinking behind them, and that some questions do not have right answers,
- the record for student achievement gains with Classtalk, come not from university physics but from inner city 5th grade reading comprehension,
- a whole pre-law course was taught only

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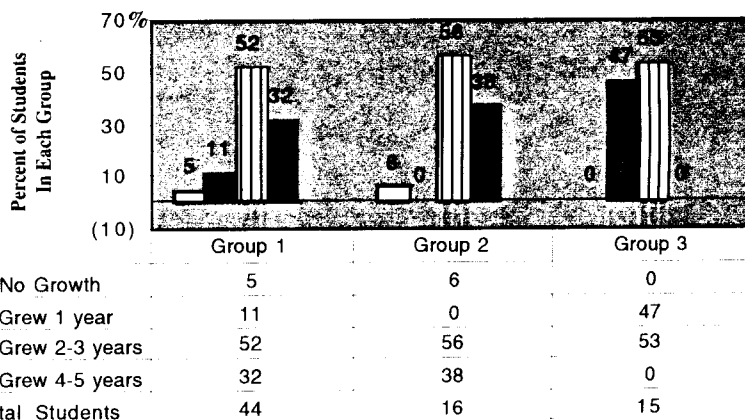
McIntosh Elementary School Gets Results in Reading Classes

Classtalk was used in a multi-strategy effort to boost reading performance of 5th graders prior to state mandated reading comprehension tests.

In the spring of 1996, Mrs. Carol Wiatt of McIntosh Elementary School in Newport News, Virginia began using *Classtalk* in her 5th grade classroom. Her goal was to help students successfully complete the standardized Degrees of Reading Power (DRP) test. The school was expecting 56% of the students to "pass" (i.e. scores "at or above grade level"). What happened next surprised everyone, 90% of the students passed! The school was besieged with visitors trying to figure out how

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**After Intervention: Reading Level Growth
 (Based on 5th Grade DRP Scores)**



Group 1- Had no special criteria and used Ct twice a week; Group 2- Were given a poor prognosis and used Ct once a week; Group 3- had a good prognosis and did not use Ct.

Univ. of Texas El Paso Breaks New Ground

After just using *Classtalk* once, Dr. Bob Webking had already done things no one had ever done before. The first time he tried the system in class he logged in 448 students, becoming the first professor to pass the 300 mark. Moments later he began to teach them Political Science ... another first. Many say the man has a lot of courage but according to Prof. Webking he needed a way to reach his students.

"The most important benefits come not merely from the ease with

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UTEP breaks new ground....

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which the system allows grades to be scored and recorded," says Dr. Webking," but with the pedagogical tools this facility allows the professor to employ. In a large class, no matter how interesting the material or how well it is presented, it is easy for students to nod off, do other homework, let their attention fade, chat with others, skip class, and so on. Classtalk creates an atmosphere in which each student must regularly interact with the material in class. It encourages attendance, but it also encourages attention. As the student's own comments show, it keeps people alert and engaged because they might have to answer a question at any moment. In some cases the motivation to get the questions right is enhanced by a certain competitiveness among the students or a certain pride in getting answers correct, motivations that are heightened by the fact that the answers are calculated immediately, and students can readily compare their answers to one another and to the correct response. As a news report noted, despite the size of the class, each student comes to feel personally involved every day. In short, Classtalk develops an active learning atmosphere even in a very large class. "

Webking was so impressed with the power of Classtalk to assist students in conceptual understanding that he decided to use the system in a setting very different from the large lecture hall. This was a class in "Law and Justice" with the purpose of learning the material, but also with a strong focus on developing analytical skills and skills in critical reading and argument.

Using Classtalk, the course was structured so that there was no lecture or direct instruction from the instructor. The class was conducted entirely through multiple choice questions. Carefully constructed difficult questions led the students to work intensely with the material and with one another to understand the arguments. Students usually worked in groups and would engage in much discussion. Typically, especially with the most difficult questions, groups would decide upon different answers and in the ensuing discussion when students and groups were explaining their thought processes, the whole group often worked its way to the correct answer. Each student knew that he or she could be called on at any time to justify an answer, so each student worked conscientiously to answer as well as possible. Two kinds of information available to the instructor through Classtalk were especially helpful here. When a student would dissent from his or her group, it was helpful to the instructor to know that he could call on that student to explain the dissent. Similarly, the instructor would watch the Classtalk screen on his computer while the students were working through their answers to spot students or groups who changed their answers, and then ask for an explanation of the change.

McIntosh gets results...

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they did it. A closer look at the strategies and data will help us to see how this performance was gained and how the interactive classroom system *Classtalk* fit into it.

The student population at McIntosh Elementary School is 79% "at risk." This means the student comes from a single-parent family or falls below the poverty line qualifying for free meals. The students need test-taking skills and reading skills and therefore, Mrs. Wiatt was 'teaching to the test'.

Some of the key strategies implemented were:

- 1) students complete reading assignment and answer questions on worksheet;
- 2) teacher addresses questions one-at-a-time with whole class, in the following way:
 - students send in their own answer by using calculators,
 - class looks at answer histogram (splits not embarrassing for individuals),
 - class analyzes "WHY" some choices are better, students explain, sometimes lots of class discussion;
- 3) students keep individual charts of their performance over the semester;
- 4) students receive a 'reward' if they miss one or fewer answers; and
- 5) as the test approached, the teacher allowed less time for answers to simulate the DRP test environment.

Data was collected based on the formation of three groups in the spring semester. The groups were divided as follows: Group 1 was randomly selected and used *Classtalk* two or more days per week, Group 2 had a poor prognosis & used *Classtalk* one day per week and Group 3 had a good prognosis & didn't use *Classtalk*. Students in Groups 1 & 2 (using *Classtalk*) advanced their reading skills more than those in Group 3. **Data shows that in Groups 1 & 2, 52 of 60 students (87%) advanced two or more years with *Classtalk* compared to 8 of 15 (53%) without *Classtalk* in Group 3.**

With funding from the Newport News School System, the Beasley Foundation, and equipment loans from Texas Instruments, McIntosh Elementary now has ten *Classtalk* systems and has extended the experiment to all 5th grade, all 4th grade, and two 3rd grade classes. Also, these systems are no longer being used just for reading comprehension, but for ALL disciplines.

New Voices at bE

Less bug reports from users, but more voices on the telephone at bE? How does that add up? It's simple - more sales in the pipeline! We're pleased to announce the hiring of two new customer support personnel, Aaron Hazlewood and Diem Pham. Their speciality is helping new *Classtalk* users get up to speed with the minimum of hassle. Best of all, their services are free!

System Wide Implementation

Some advice from the Naval Academy

Many of our customers ask for advice on how they should "spread the good news" so to speak. "I know others in my department who would like to try the system," they say. "They have lots of wonderful ideas and I want to encourage them, but I also want them to avoid the mistakes that I made."

I was speaking to Bob Shelby about this issue at a recent AAPT meeting. Prof. Shelby started using Classtalk in 1996 and since that time has managed to get every professor in his department to use the system. "It's not hard to have success with Classtalk," he said, "we've proven over and over that it can be done, all you have to do is follow certain guidelines." Bob is clearly a leader as well as being a wonderful teacher and I have great respect for what he has accomplished, so I asked him if he could please write some of the guidelines out for others. This is what he sent me.

1. Practice using the interface and doing a student sign on several times before trying to use the system in an actual class. This should include trying to follow the instructions that you will give the students for logon and answering questions. This practice session should be repeated a couple of times each semester to remind you of the procedures that the student users need to follow and the problems that they may encounter. You must be confident that the system can and will work or the students will rapidly find excuses to explain why they can't seem to make the system work properly. Your attitude is extremely important!
2. The first time that the system is used devote several minutes to walking the students through the login and question answer procedure. You may need to repeat this a couple of times, but the payback is in time saved later in the semester when operating the system has become second nature to the students.
3. Discuss the reasons that you have chosen to use the system with the students. Cover the positive results of peer instruction and the need to focus on concepts. Remind them that if they don't like the system, you can always spend all of each class period giving your "exciting" lectures. Getting students on board concerning the reasons for the use of Classtalk is another very important factor in successful use of the technique.
4. Don't try to do more than 2-4 Classtalk questions in any one class period. Like any technique, Classtalk is a partial answer to how we can make the classroom experience more active for our students. Remember to mix in group problems, some lecture and other techniques. Keep the students active and focused on ideas.
5. I prefer asking each question twice as Mazur does. The first answer is an individual response with no discussion. The second answer is given after a histogram of the first answers is shown and peer instruction has taken place. The first asking requires each student to start up their brain and the second asking encourages effective peer instruction. About 5-6 minutes are used per question, but the time cost is not large when compared to the payoff in active participation and concept review.
6. There are many ways that one can give credit for Classtalk answers. I suggest that only second answers be used for credit to encourage peer instruction. I also suggest that the importance of learning be stressed over evaluation in the use of these questions. One compromise is to count second answers 3-5% of the course grade. However, a colleague has been very successful in encouraging active use of the system by the students by using Classtalk answers as extra credit points.
7. If your students don't appear to be having fun using the system, something is probably not going well. Talk to some experienced users and discuss your situation.
8. Finally, there are many creative ways that one can use the Classtalk system, but my last advice is to start out your experience using techniques that have already been shown to work. After you get off to a good start, there will be plenty of time to make evolutionary changes to better suit your style. Many failed attempts have gone into establishing the guidelines listed above, so start out by profiting from our many errors.

The British Reconsider their "No Calculators Policy"

When Better Education introduced its Calculator compatible network they knew that some schools may be opposed to the idea of their students using calculators. Much has been written about the advantages and disadvantages of the use of calculator technology in education at various levels and in various disciplines and it is difficult to make broad generalizations when discussing this topic. It has become clear however, that when used with care, calculator technology can add significant value to a lesson. The interesting part then becomes planning calculator technology into your lessons.

The British have been much more conservative than the US in adopting the use of calculators in their curriculum and it was only last year that Strathclyde University, one of Britain's most progressive institutions, made graphing calculators legal on their exams. One of the factors that helped influence their decision was that graphing calculators could be used as communicators in the classroom with a Classtalk network. Prof. Jim Boyle made a strong case for the benefits that Classtalk would provide their students. Boyle actually made two trips to the United States in order to meet professors who had been successfully using Classtalk for several years. He used the information he gathered on these trips in conjunction with other research to describe in detail how Classtalk could be used to greatly enhance the classroom experience.

See [What's New At the Web Site](#) (on page 4) to find out how to download the write up on "Taking advantage of handheld technology and calculator networks," a workshop by Jim Boyle and Harry Gretson.

Get Started today with Flashcards

The real magic of interactive teaching is in your pedagogy - not in the tools you use. All that tools can do is make it easier, more efficient, & more effective. Obviously these are worthwhile things, or we would not have gone to the trouble of developing Classtalk. But, there is another alternative if you don't have the money for technology. Get started today with Flashcards! Eric Mazur describes them in his book "Peer Instruction", and Mani Manivannan of SE Louisiana Univ. has presented several papers on their use. Louis

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Flash Cards cont...

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Abrahamson, one of the inventors of Classtalk, also used this technique at the University of Zimbabwe in June 1991. He describes his experience.

"I was teaching a software engineering course to about 80 second-year computer science students. Zimbabwean students tend to be very passive, so I wanted to engage them more than I could by just lecturing. At my father-in-law's house I got some white card and five old cans of different colored paint. I painted one side of the cards to make 35 packs of colored cards (about 8"x6" in size). An elastic band held each pack with five different colored cards together. At the start of my first class, I asked the students to form themselves into groups of 2 or 3, and for one person from each group to collect a pack of cards. Later in the course of my lectures, I would ask multiple-choice questions and color-code each option, giving the class a fixed amount of time (1 to 3 mins) to discuss the answer among themselves in their groups. At time-up one person in each group would hold up a card (with the colored side towards the front), and five volunteers in the front row would stand-up, turn around and count a color. I drew the resulting histogram on the board, and would use it as a springboard for discussion, resolving conceptual differences, or simply for brief comments before moving on to the next topic. Of course, I had no permanent records so student commitment to their answers was not as high as in Classtalk classes, but the process was quick, smooth, effective, and very rewarding in terms of class involvement with the material. I would do it again in a flash!"

Classtalk grows up....

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with questions, small-group work, and class discussion (ZERO lecturing),

- that the two biggest Classtalk sites (the US Naval Academy and McIntosh Elementary School - seven and ten classrooms respectively) are exclusively SMALL classes,
- that discovery-based learning and Socratic teaching can work together in ways no-one imagined a year ago,
- that the disciplines using Classtalk include physics, chemistry, biology, sociology, mathematics, political science, pre-law, psychology, reading comprehension, business negotiation, and history.

Unquestionably, these results vindicate our ambition to expand on the power and flexibility of Classtalk. But, we're nowhere near the end. Stay tuned as we continue to grow and mature!

What's new at the Web Site?

<http://www.bedu.com>

The following articles have all been added to the publications page. They can be viewed in either HTML or downloaded to your computer in Adobe Acrobat's PDF format.

<http://www.bedu.com/publications.html>

- Bob Webking, a Political Science professor at the University of Texas El Paso describes his experience using Classtalk in two distinctly different settings.... A five hundred seat lecture hall where he teaches Political Science and a 23 student class where he teaches Law and Justice to students preparing to apply for law school.
The paper described above by Dr. Webking was originally in a multimedia format. Video clips that further illustrate certain passages are referenced throughout the paper and can be downloaded from the following URLs. For a CD ROM please contact us.
- Bob Shelby, a Physics professor at the US Naval Academy, publishes a white paper on the advantages of Classtalk in small Classrooms.
- Classtalk makes the Boston Globe.
- The paper by Dr. Louis Abrahamson presented at the "Samos International Conference of the Teaching of Mathematics entitled *An Overview of Teaching and Learning Research with Classroom Communication Systems (CCSs)*
- Jim Boyle an Engineering professor at the University of Strathclyde conducted a day workshop at the University of Birmingham on 1/8/99. The workshop was entitled *Taking advantage of hand held technology and calculator networks*. CTI Mathematics, which hosted the workshop, publishes a summary.
- An extensive index of FAQs are available to the user group. If you have not registered with us and gotten your password you can send an e-mail to support@bedu.com with the subject "Register Me".

The Interactive Classroom

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