

Message from the Chair

WHERE'S THE REVOLUTION?

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Several years ago, I gave a presentation entitled, "A Report from the Barricades of the Multimedia Revolution." At the close of my remarks, someone in the audience objected that the term revolution was inappropriate, since technology would not cause enough change in the way that we teach to justify this description. He predicted that in a decade we would still be teaching the same things in chemistry classes, with the only change being the possible addition of a few technological bells and whistles. If I remember correctly, I replied that we would have to wait to see if I were right or not.

I was reminded of this conversation during the on-line CONFCHEM sessions early this year, especially the one concerned with what we teach in general chemistry. For me the significance was not just the challenge to the status quo, but the fact that 800 chemical educators from all over the world were involved in the discussion. In the past, a proposal of this type could attract the attention of a relatively small number of college teachers for a very short time at a conference or in a journal. I was impressed with how much technology is changing the way we communicate. This role of technology as a facilitator of change may be far more important than any specific new teaching technologies introduced into our classrooms.

This impression was further heightened a short time later when I read an article entitled, "The Future That is Already Here" by Philip Clark in the April 1999 issue of The Technology Source (<http://horizon.unc.edu/TS/vision/1999-04.asp>). Without electronic communications, it is unlikely that I ever would have seen this article, and it even possible that it would not have been written. Clark argues that, to a large extent, we can now identify the factors that will shape the future of higher education and the rough shape of that new world is already visible. One of the most important of these factors is surely computer-facilitated communications, and as noted earlier, we are already beginning to see the effects of this. Clark argues that the future of higher education is already in place and we should focus on trying to harness the driving forces behind this change.

The coming decade may present a special challenge

for all of us in higher education and especially for the Committee on Computers in Chemical Education. Whether it will truly be revolutionary remains to be seen, but it will certainly involve many challenges to our normal way of doing things. This Committee will increasingly be called upon to provide the technology needed to facilitate changes in both how we teach as well as what we teach. Our most important task is to remember that technology must always be the servant of pedagogy. As long as the main goal is to improve the educational process for our students, we are on solid ground, whether we call it a revolution or not.

Multimedia in Lecture Continued

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I've just finished my first semester using PowerPoint in lecture. Here are some observations while they are still fresh. You can spend a great deal of time putting together your own PowerPoint lecture material. Add to this a less than clear idea of what you can use under copyright law in your lecture, on an intranet, or the Internet, and I'd suggest asking the author(s) of the textbooks you are using if they have material available.

Jack Kotz, 'Chemistry and Chemical Reactivity', is making his PowerPoint material available at <http://www.saunderscollege.com/chem/general/masterton/> for users of his textbook. You need User ID and a password available from a Saunders representative.

Karen Timberlake, author of 'Chemistry', Harper Collins, has some of her PowerPoint lectures available at: <http://www.lavc.cc.ca.us/dept/chemistry/timberlake/>

Just as we don't use textbooks verbatim I'm sure you will want to make changes even in excellent work such as these, and it will give you a really useful start. You'll want to customize it for your situation. A number of people suggested using a dark background, such as deep blue, with yellow-gold fonts. I experimented with some PowerPoint backgrounds, designs, and color schemes. Between those included with PowerPoint and the PowerPoint value pack there is a wide variety of choice.

You can strip out anything you don't like. Bring up one of the designs in PowerPoint and play with the entire screen, I stripped out the background shapes and put in some of my favorite molecular structures made in a drawing program. The structures are faint and don't seem to affect readability, a number of students commented positively on it. Once you get a design you are happy with go to View-> Slide-> Master and save your creation to be the default for your slides.

I used both a dark blue and a dark green for background. Jack Kolz uses lighter backgrounds and his looked great projected. He also tends to use a lot of graphics and at least 32-36 font, colored boxes, and shadow effects. There are many ways to set up the title with text and graphics. Having a title box and a textbox on the master worked well with the font size and color set. It is quite easy to add additional textboxes and graphics, buttons, links to movies, programs, or the Internet.

Other admonitions are to use at least a 28 font, Arial seems to project very well with my system, but any plain font seems all right. You can use a lot 'animations' in PowerPoint. These are ways to have your text move onto the screen, some with sound. Many experienced users suggest not mixing too many fonts, 'animations,' and sound effects. Personally I like 'appear' and 'zoom in' with an occasional 'fly from the left' for special emphasis.' Looking over slides I have used this last semester the ones that appeal most visually are those with a 32 font and graphics. Another suggestion is not to put up too much text. This is easier said than followed in practice since there are advantages to having a complete concept or problem available on one slide.

Graphics: A picture is still worth a lot of words, and is often a good take off point for discussion. Having the graphics supplied with the PowerPoint lecture material from a publisher without concern for copyright is helpful. JCE: Software has a number of CD's with graphic material including QuickTime movies available at <http://jchemed.chem.wisc.edu/>, for use as additional mate-

rial. Let us know if you find other sources.

I ran a simple questionnaire past my students about a month into the semester to get feedback about PowerPoint while I could still use it, and found that they generally like the PowerPoint format quite a bit. A few felt we were going too fast. Most of the remarks made to me in person about going too fast were from students who never made it to class on time, and then took another lengthy period to get their material out and start taking notes.

With a remote in one hand and a laser pointer in the other I find myself walking more among the students, and in particular spending more time near students who are doing poorly. It is interesting, many are just doodling, and gentle suggestions that it may be a good idea to copy down some of the material resulted in better performance. Some of my A students took virtually no notes, but were generally attentive and interactive.

In place of a screen the lectures were projected on the side wall. This allows me to have a large Periodic Table at the front and room to put up additional material on the board in response to student questions. A number of students commented they got more out of the problems done at the board than those laboriously done in PowerPoint. Since those done at the board were in response to specific student questions it is not surprising.

As mentioned last time I projected some examples where students answered multiple choice questions or parts of questions by holding up cards with a-d on them. This continual feedback on how the entire class is doing was helpful. It also keeps the daydreamers more involved.

I used a number of QuickTime movies and Director animations, http://www.eclipse.net/~pankuch/use_animation.html (which I made myself). There are 2 ways I can call up QuickTime movies. One is to make a link from the slide by selecting a button or graphic on a slide, and command-k (on a Mac) then choosing the address of the movie. Clicking on this link allows you to open the movie in Simpletext where the movie plays fine, except you can't resize the movie or anything else. OK for me since I have software that allows me to enlarge the movie to my hearts content. Though this is a little tedious. An alternative is to link to MoviePlayer, which usually plays the QuickTime movies. In MoviePlayer you can resize the movies directly, loop endlessly, etc., but you have to use File in MoviePlayer to open your movie.

I decided I didn't want to be fumbling between many different electronic systems to show QuickTime movies

and Director animations, simulations and programs. I wanted it as smooth as possible-click and connect. This means having everything I use on my PowerBook hard drive. At the moment my PowerPoint files are about 400 MEG and growing. I can access anything with a few clicks. Drives 8-9 G are available with 36 G shortly available, and of course DVD is also available so you can have a lot of storage.

Showing a 30-60 second QuickTime movie once is not effective with my students. What seemed to work was putting a simulation up on loop letting students watch and discuss it with their study group. I asked the students to write up the important points they saw individually, collected them, and read a few anonymously, discussing with the class what was being missed. I then summarized the important points. I didn't announce it, but put up the same simulation for the next test. Students were asked for an explanation as an extra credit problem - virtually everyone did quite well.

This would cost a great deal of time to do with each QuickTime movie, perhaps doing it occasionally will develop some critical ability that carries over.

My decision has been to use my big desktop machine at home for all development work. Primarily because I have a 20" screen and the mouse is much faster than the touch pad at the moment. Only "finished" work is then transferred to the PowerBook. Unfortunately some links seem to be lost doing this unless I do a complete transfer of the whole 400M file. Clicking on links and having them fail in the middle of a lecture is not fun. A cable can be used to hook the PowerBook directly to the desktop computer it then acts like another hard drive and transfer of the entire 400M file is a couple of minutes.

When comparing different strategies I use, students at the end of the semester had the most positive remarks about having them solve problems at the board with their study groups (I also use the study groups on research projects). They were positive about PowerPoint, and linked animations. When asked for suggestions of what to tell students starting the course my interactive chemistry programs were at the top of the list.

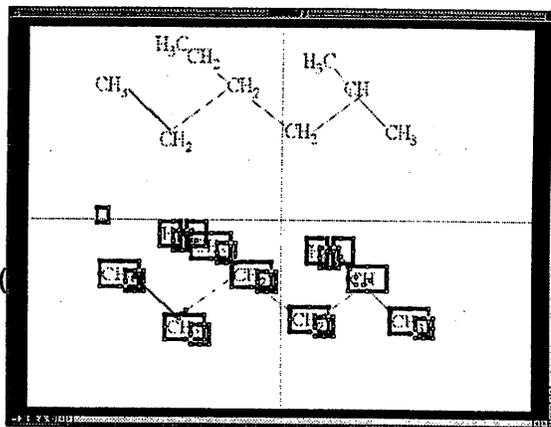
Tests that had been given previously were used for comparison. No meaningful differences were obvious looking at grade distributions.

I did, however, have one lecture in which no one earned less than a C, which has not happened for over a decade. I'll be impressed if this happens often. For the moment it is a lot of time and energy, but bouncing out of bed early on Saturday and Sunday to enthusiastically try a new idea is great. Personally I'd recommend it

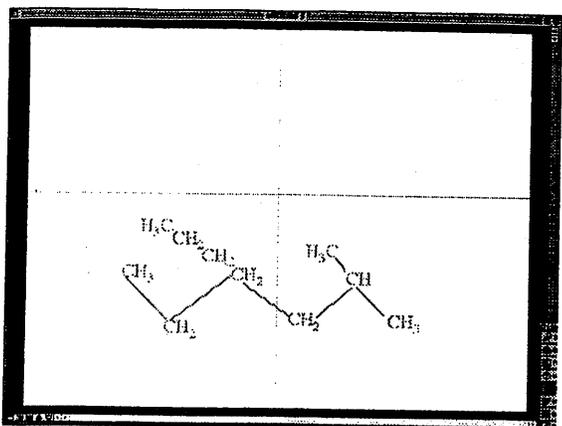
highly if you enjoy playing on computers and exercising some creativity, but I'd start with as much already done as possible from your publisher, and spend your extra energy on being creative for your individual students. Enjoy!

Adjusting molecular structures in PowerPoint:

If you take a structure built in a drawing program such as ChemIntosh 3.4.4 the structure may be somewhat different than you want. Or you may want to make a few changes in it without leaving PowerPoint. A handy way to make changes in PowerPoint is to take the structure, select it then choose ungroup



At the top of the figure is the molecular structure. The bottom of the figure is what it looks like after it has been selected and ungrouped. I have the icons for group and ungroup on my toolbar. For those with contextual menus (on a Mac) you can select any portion of the drawing holding control and a popup menu will give you access to group and ungroup.



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Possible change:

We've been discussing switching from a printed Newsletter to only electronic on the Web. If you have any ideas pro or con send comments to me at pankuch@eclipse.net.

I've taken the original structure, ungrouped it, selected and duplicated a CH₂, pasted it in so I've added a CH₂, and thickened the bonds in the backbone.

In the above figure the new structure has been selected (use your mouse to draw a selection rectangle around the entire molecule) and regroup clicked on. The resulting structure may be moved, stretched, shrunk etc. You can ungroup move, delete, copy and paste parts and group together as often as needed.

Personally I find this easier if I don't have the drawing program up and running.

Using Multimedia II - Setting the Stage
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The topics of room design, equipment selection, and teacher training are too complex for a short presentation of this type, and fortunately administrators are normally willing to dedicate serious resources to these decisions. Unfortunately, there are some other basic requirements that are not very glamorous but are equally essential to support a computer-based lecture. These often-overlooked topics include well-designed lighting, good technical support, and an assurance that the teaching space will continue to be available from semester to semester. The absence of any of these can create a potential disaster, despite a well planned facility.

Considering how much money is being spent on equipment for multimedia teaching, it is amazing how often I encounter rooms where the lighting is inadequate. In one case, I visited a campus to give a talk and was assured that the lighting in the room where I was going to speak was adjustable. It was; I could either turn the lights off or on. Neither level was satisfactory.

In order to give a lecture from a computer, an intermediate light level is necessary, that is dim enough to make the projected images clearly visible but bright enough so that the audience doesn't fall sleep. With modern equipment, a fully darkened room is no longer necessary for computer projection. On the other hand, even with carefully designed frames, normal room lighting is often too bright. Like the story of Goldilocks and the Three Bears, an