WHY I NEVER USE POWER POINT WHEN I TEACH:
SOME THOUGHTS ON TECHNOLOGY AND INSTRUCTION

James Trefil

Robinson Professor, George Mason University, Fairfax, VA 22030, USA
jtrefil@gmu.edu

How to teach, especially if you have to teach at university level? Shall you use a powerful and sophisticated computer-based technology, using a widely known Power-Poi nt program? Or, perhaps you should stick to the old-fashioned chalk-and-blackboard style? Through a series of nice examples the author explains the source of his reservations about the use of the modern technology, that for sure cannot compensate for the poor content, and sometimes could even severely distort the message.

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A while ago I had an interesting experience. My friend and colleague Prof. Vladimir Petrushevsky of the Chemistry Department at Ss. Cyril & Methodius University was visiting the United States. He was in Washington DC attending a seminar on tolerance (organized by the American Jewish Society and Friedrich Naumann Foundation), and we managed to squeeze in a day for him to visit my university, which is in the suburbs of that city. I asked him to talk to my class, which was a group of first year physics students. Because the class lasted for 90 minutes, I gave a short lecture on the Bohr atom at the beginning, then turned the class over to him. He talked to the students about the Republic of Macedonia and the situation in the Balkans then asked for questions.

Some of the questions were what you would expect – How are classes organized in Macedonia? What is student life like? One student, however, posed a question that surprised both of us. “What was the biggest difference” she asked “between Prof. Trefil’s lecture and what you would expect in Macedonia?”

My friend thought for a while, then said “What surprised me most was that he gave the lecture using only chalk and a blackboard. In Macedonia he would have used a computer and made it into a Power Point presentation or using an overhead at the very least.”

The class went on, with the students getting a good introduction to the political situation in the Balkans, but the more I thought about that exchange, the more I realized that what had been uncovered was a basic issue in the philosophy of education – the question of the relative importance of content and manner of presentation. Why do I (and many of my colleagues in the United States) still use the old fashioned chalk-and-blackboard style? Is it just inertia, or are there more important issues involved? Over the past year I have wrestled with this question, and I’m writing this note to explain the conclusions to which I have come.

A word of history: As a physicist, I have been involved with computers throughout my career. As a student working for the summer at Argonne National Laboratories near Chicago, I used an old computer that had to be programmed in machine language. I have followed computer technology from mainframes to shared access to personal computers to laptops, learning to use each as it became obvious that it would help in my work. In that odyssey, I have noticed several things about the way that available technology shapes everything in intellectual life, including teaching.
The medium can’t compensate for poor content

If you have only a few, poor quality data points, presenting them in a beautifully colored three-dimensional graph doesn’t really change anything – it’s still poor quality data. Similarly, if you don’t have something significant to say, having text fly in from the side of the screen doesn’t really add anything significant. The problem, in both cases, is that the overpowering visual effect of the presentation can obscure the poor quality of the ideas behind it.

This fact has had extremely pernicious effects on public debate in the United States. When presenting the results of computer modeling of greenhouse warming, for example, environmentalists often show maps of the temperatures predicted for a century from now. The maps invariably show the center of the North American continent in blazing red, conveying visually the extent of the predicted warming. These maps have an enormous impact, particularly on people who don’t understand the complexities and uncertainties involved in climate modeling. Like people who believe that if something is printed in a newspaper it must be true, they assume that if a computer produces a beautiful graphic, that graphic must have some relation to reality. A different presentation of the results – a table of predicted temperatures with error bars, for example – would be more honest, but wouldn’t have the same impact. (I sometimes entertain the unworthy thought that the people who use these graphics know this, but are so sure of the rightness of their cause that they choose impact over honesty).

Actually, it shouldn’t be too surprising that graphics – even misleading graphics – have such a powerful effect on us. We are primates, after all, and like the rest of our kind we have evolved to be highly visual in our approach to life. We say “I see” when we mean “I understand”. In a sense, then, the use of computers to produce graphic images is the continuation of an old human tradition that goes back all the way, I suppose, to paintings on cave walls.

The medium we use shapes the way we think about a subject

This truth is as old as the human intellect. When knowledge was passed on by oral tradition, only a few people could have access to it, and information was taken in by listening. The development of writing (and later, printing) made information much cheaper than it had ever been, and thus greatly expanded the availability of knowledge, first in Latin, then in the vernacular languages. But there was another effect of this technology. Because of the way a book is laid out – one page following another – arguments and writing had to proceed in a linear fashion, going more or less directly from point A to point B. This inescapable fact shaped the way people thought, a fact that has been pointed out by countless scholars. Despite attempts by some writers to overcome this aspect of the written word by using modern information technology (by producing hypertexts with links that move you around inside the overall work, for example), the written language remains basically linear. Please note that this is not a complaint – there is a lot to be said for linear, logical thinking – but simply an observation on the effect of a medium of communication on what is being communicated.

Compare the printed word to a medium like television, which operates in pictures. When you look at a picture, you see many things at once – in essence, you approach reality as a gestalt rather than as a linear chain. Again, as many scholars have pointed out, this changes the way that young people perceive the world. I have seen the effect of this new perception in the writing of textbooks in the United States. Instead of a textbook being a long series of pages, presenting an argument in a linear fashion, the pages are broken up into little boxes, each of which has part of the message, and the student is invited to jump from one box to the next rather than to read the text straight through. The effects of this new kind of organization on learning remain to be determined.

So where does Power Point fit into this scheme? You might think that because it is a visual technique, it would be more akin to television than to a book, but that has not been my experience. It seems to me that the internal mechanics of Power Point often constrain speakers to a kind of hyper-linearity, often exemplified in the use of a standard screen with bullet points. This often has a constraining effect on the presentation, making it less than it could be. This point is often made by people of a more humorous bent by taking a famous speech or poem and converting it into a Power Point format. In the United States, we might choose something like the Gettysburg Address, a speech made in 1863 by our President Abraham
Lincoln – a speech that every school child learns. But consider, if you will, what a Power Point presentation of the famous poem “Т’га за Jug” by Konstantin Miladinov might look like:

- Wings of eagle
- Fly back, homeland
- See Stambol, Kukush
- Dark sun?

As with this example, there are often situations where the constraints of Power Point change the message in unfortunate ways.

There’s nothing you can do with Power Point that you can’t do with other media

When you come right down to it, there really isn’t all that much to Power Point, at least as it is used by most speakers. Displaying words on a screen (by far the most common use I have seen) can be done by overheads, ordinary 35 mm slides, or (dare I say it?) with chalk and blackboard. The same is true of images—in fact, I would argue that a speaker drawing a sketch on a blackboard while explaining what he or she is doing is probably a better way to convey information than having listeners passively watching an animation.

It’s not always a good thing to be the first to adopt a new technology

The problem is that new technologies are seldom designed to be user friendly. They are typically designed by engineers who concentrate on making the system work and don’t mind manipulating complex controls or dealing with inevitable bugs. First users typically have to spend a lot of time just getting the system to do what they want it to do. In addition, when systems are being introduced, they often don’t work very well, and require a lot of attention. I can remember colleagues – physics professors – literally spending months wrestling with recalcitrant software while their research efforts languished.

My question is simple: is it better to spend the time in this way, or to spend it in improving the content of your lectures or the quality of your research papers?

For me, the answer to this question is obvious – getting the work done is more important than getting the new machine to work. If you wait a while, the computer technology will become user friendly and reliable, so why rush in at the start? I don’t like to think about how many times I have sat idly in a seminar room while a visiting speaker tried to get his Power Point presentation to run on unfamiliar hardware. Wouldn’t he have been better off using a simpler presentation scheme? It is, in fact, a truism among people who often present talks at other institutions that you should carry a back-up presentation, usually in the form of overhead transparencies, for emergencies like this.

In the end, then, I see no point in putting down my chalk in favor of some other medium to teach my classes.

This doesn’t mean that I think that there is no place in education for new technologies – far from it. In the United States there is a clear educational niche for what we call distance learning, for example. This is a technology that allows a professor standing in a room in one city to be seen and to interact with students in other places. This is particularly important in the United States, because for historical reasons many of our major universities are located in small rural towns, far from major population centers. Without distance learning, the expertise of these faculties would be available only to students in their own universities, rather than to the entire country.

Similarly, I see a real place for the use of computers to lead students through repetitive learning drills – in language learning, for example. I am also interested in a new system for use in large lectures, in which students can interact electronically with the lecturer. The teacher in these lecture rooms can, for example, ask a question to see whether students understood a point made earlier and get real time feedback on what they have learned. (He or she can also display the results of the quiz to the class in real time, a process that seems to have a positive effect on learning).

The point of these examples is that in each case there is a clear educational rationale for adopting a new technology. Since I don’t see such a rationale for Power Point, I don’t see a reason to change the way I do things. As a result, when my Macedonian friends visit my classroom in the future, they will see lecturing done in old fashioned way.
Резиме

ЗОШТО НИКОГАШ НЕ КОРИСТАМ POWER POINT ЗА МОИТЕ ПРЕДАВАЊА: НЕКОИ РАЗМИСЛУВАЊА И СУГЕСТИИ ЗА ТЕХНОЛОГИЈАТА НА НАСТАВАТА

James Trefil
Robinson Professor, George Mason University, Fairfax, VA 22030, USA
jtrefil@gmu.edu

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Како да ги учиме слушателите, особено ако се работи за студенти на универзитет? Треба ли да се употребува моќна и софистицирана компјутерска опрема, на пример добро познатата програма Power-Point? Или пак, можеби, треба да се држиме до старомодниот стил на крeda и табла? Преку серија убаво избрани примери авторот ги изложува причините поради кои е резервиран во однос на употребата на модерната технологија, која тешко може да ја компензира слабата основа, а понекогаш може дури и сериозно да ја изопачи основната идеја.