WHITEBOARD VERSUS POWERPOINT: FRIEND OR FOE?

Dr Soo Yuen Jien
Department of Computer Science

Introduction

Nowadays, students have grown to expect the lecturers to conduct their lectures with the use of information technology (IT). Presentation software such as Microsoft PowerPoint, Adobe Portable Document Format (PDF) and so on have virtually taken over the classroom. It is hard to imagine the speed in which this has happened, even for someone like me (and those in my generation) who personally experienced the transition. About 10–12 years ago, when I was an NUS undergraduate, there were still a few lecturers who wrote their lecture notes on the blackboard. Other lecturers used transparencies and overhead projectors for better portability and faster delivery. Lecturers who used presentation software were the minority. However, when I started lecturing five years ago, most, if not all lectures were delivered using presentation software instead of the more ‘traditional’ delivery methods.

This ‘invasion’ of technology leaves many with ambivalent feelings. Lecturers and students have grown to either love or hate this ‘new’ technology with different justifications. In this article, I will showcase a delivery method that attempts to incorporate the best of different delivery methods. This article will present a brief overview of the pros and cons of different delivery methods, suggest two lecture styles that can be used to enhance any software-based delivery methods and conclude with some comments and feedback from colleagues and students on the alternative lecture styles.

Common Lecture Styles

This section will attempt to capture the advantages and disadvantages of two common lecture delivery methods—the traditional method where the blackboard/whiteboard is used predominantly, and the IT-based method where presentation software is used. We will cover both the lecturers’ and students’ perspectives where possible.

Whiteboard/blackboard presentation

In this delivery method, lecturers deliver the lecture content verbally, write down some points occasionally, draw illustrations and solve problems on the whiteboard/ blackboard. Students are usually not given any handout in advance and they have to take notes during the lecture. For the lecturer, this delivery method requires comparatively more mental preparation as there are no visual aids to cue him during the lecture. However, the absence of predefined constraints on the content allows the lecturers to adapt the content on the fly (e.g. he/she can ask questions to explore a certain point further or use any spur-of-the-moment incidents as examples). Of course, this method requires the lecturer to have stronger organisation skills to deliver a tight and focused lecture. As the lecturer needs time to write on the whiteboard, students tend to be more comfortable with the speed of such lectures.

Usually, students should find this delivery method more captivating. As the handouts are not given out in advance, students tend to focus more intently on the lecturer. Hence, a skilled lecturer can take the students on a journey of discovery, exposing students to one interesting fact after another. As the notes are written with the lecturer’s explanation, students should have better retention of the content afterwards.

However, this delivery mode can cause note-taking fatigue, especially at the end of a long day. If the students lose focus for even a short moment, it can be difficult to catch up with the lecturer. To a certain extent, the legibility of the lecturer’s handwriting also plays an important role for the method’s success.

Pure PowerPoint presentation

The lecturer prepares and distributes the lecture slides to the students before the lecture. During the lecture, the lecturer shows the PowerPoint slides and explains the points. Students bring along the lecture handouts and take notes occasionally.

The lecturers need more effort in preparing the slides for this method. As the coverage and flow are fixed within a finite number of PowerPoint slides, this promotes better organisation of the lecture topics. During lecture, the individual PowerPoint slides serve as memory aids, which reduces the mental strain on the lecturers. Although the effort in writing a good set of presentation slides is considerable, they can be reused or adapted with ease for future lessons.

Students should find this delivery method less tiring. As most of the content are already on the handouts, this reduces the need to take notes during the lecture. Students should be able to pay more attention to the discussion on the topic instead of taking notes frantically. The handouts are also more portable as softcopies are usually distributed rather than printed copies. Students can easily view softcopies of the notes on any electronic device such as a personal computer, laptop or even a mobile phone.

However, there are numerous drawbacks to this presentation style. Many lecturers tend to create PowerPoint slides that are more suitable for reading than presentation. Such PowerPoint slides induce the lecturer to read from them verbatim without giving further explanation. As the content is fixed in advance, it can be difficult to adjust or adapt the content on the fly, resulting in a rigid and stale lecture.
Although students may find the handouts convenient, they soon find that it is less important to attend the lecture as everything can be found on the lecture notes. Besides, students can find the overcrowded PowerPoint slides overwhelming and these can take their attention away from the lecturer’s explanation.

As presentation software become more popular, the problems associated with it are more noticeable. For example, in the blog posts of a US student, Carolyn (2009) found that “PowerPoint wielding” lecturers tend to be very boring and less lively as lecturers simply read from the slides during lecture. Carolyn (2010) said “I prefer my professor’s illegible handwriting to your PowerPoint presentation” as she felt the blackboard style lecture helped her focus better on the lecturer’s discussion.

Proposed Alternative Lecture Styles

The traditional whiteboard/blackboard lecture style has many desirable traits, in particular, its ability to capture the students’ attention is instrumental in effective delivery. In this section, I will suggest two simple adaptations and how we can incorporate these traits to lectures that are delivered with PowerPoint.

Lecture style one: Giving students two sets of lecture notes

The main problem with the PowerPoint lectures is that students already know in advance the contents of the lecture from the handouts. One possible way is to hold back the handouts from the students until the lecture is over. However, it may not be easy for students to familiarise themselves with the lecture’s content beforehand without having the notes in advance. In addition, having to keep up with the PowerPoint slides and taking notes during the lecture may be too distracting for the students.

To overcome this, we can prepare two set of PowerPoint slides: one for distribution before the lecture (the print version), and another to be given out only during delivery of the lecture (the live version). The basic premise is to use the different sets of handouts is to capture the students’ attention. We suggest some possible ways to differentiate the two sets of lecture notes in Table 1. Other ways of utilising this style can be found in a short survey at the end of the article.

Table 1. Some possible ways of differentiating the two sets of lecture notes.

<table>
<thead>
<tr>
<th>Print Version</th>
<th>Live Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable for reading.</td>
<td>Suitable for presentation.</td>
</tr>
<tr>
<td>Contains detailed explanation, but does not contain exploratory notes.</td>
<td>Contains only major points with shorter phrasing. Additional explanations are given during live delivery.</td>
</tr>
<tr>
<td>Solution to examples can be omitted to encourage students to attempt the questions in advance.</td>
<td>Examples can be worked out on the spot.</td>
</tr>
</tbody>
</table>

Some students might find the different sets of lecture notes disorientating. However, the following tips can help to alleviate this problem:

- Inform students in advance of this practice
- Keep the slide layout, and more importantly, the slide number consistent in the two versions.

Though this lecture style means more work in maintaining two sets of lecture notes on the lecturer’s part, they can be reused with minimum updating and modifying after the initial effort.

Lecture style two: Turning PowerPoint into a whiteboard

Delivering a lecture using PowerPoint presentation can still feel quite stale compared to a traditional whiteboard presentation. It seems that the lecturer can only elaborate
on the topic verbally or through the words on the PowerPoint slides. Some lecturers try to use video/audio clips or animate some of the points to spice up the delivery. However, we can literally turn the PowerPoint into a whiteboard.

During the presentation, we can use the ‘ink annotation’ feature in the PowerPoint software, which allows us to use the mouse as a virtual pen to write/draw on the PowerPoint slide. With this tool, we make annotations on the PowerPoint slides to bring life to our lectures (see Figures 1 and 1A).

Figure 2A illustrates how simple drawings can be used to evoke students’ imagination and recapture the charms of whiteboard/blackboard magic. Instead of using the mouse as an input device, additional hardware such as a touch-sensitive monitor and a stylus pen can be used to annotate the PowerPoint slides to enhance this technique and make one’s handwriting look more natural.

Combining the Proposed Lecture Styles

The two proposed lecture styles can work together to create an interactive and interesting lecture. Below is an actual example from the course, CS3220 “Computer Architecture” which I taught in Semester 1, Academic Year (AY) 2008/2009. Figure 3 shows the PowerPoint slide in the print version of the students’ handout, with clearly labelled diagrams and complete explanations. During the lecture, only Figure 4 was shown and I annotated on the slide to explain how the mechanism works (see Figure 5).

Evaluation

I have utilised the proposed delivery style in different courses from 1000- to 3000-levels: CS1102C “Data Structure and Algorithms in C++”, CS2106 “Operating Systems” and CS3220 “Computer Architecture”. The following are some qualitative evaluations from students on the technique:

- “Knows how to draw relevant diagrams to illustrate a problem.”
- “Tries to explain complex concept with illustration, which helps us absorb the idea easier.”
- “I like the use of drawing pictures to explain things by this teacher.
- “It makes us understand the question better and understand its solution easier.”
- “His PowerPoint presentation works like an educational software, with clear and detailed explanation of codes and concepts.”
- “Another notable technique that he uses for lecture is drawing with the stylus to illustrate examples which proves to be extremely helpful in understanding.”

A Simple Survey

I conducted a simple survey for lecturers in the School of Computing who made use of similar techniques covered in this article. The sample size was small (seven lecturers), but should be helpful for teaching staff considering these techniques.
Tables 2 and 3 provide a summary of the results.

**Table 2. A summary of the results from the survey on using two sets of lecture notes.**

<table>
<thead>
<tr>
<th>Teaching Style: Using two sets of lecture notes</th>
<th>Summary of results</th>
</tr>
</thead>
</table>
| Why do you make use of this teaching style?    | • Can better engage the students.  
• The two sets of lecture slides serve different purposes.  
• Having the live version allows tweaking until the last moment. |
| What are the major differences in the two sets of lecture slides? | • Live Version: Complete set.  
• Handout Version: Missing portions of explanation.  
• Live Version: Presentation-friendly, less words and more visual aids.  
• Handout Version: With more detailed information to help students in their revision.  
• Live Version: Funny pictures, jokes, extra examples, less text.  
• Handout Version: Optimised for printing with smaller font and less white space. |
| What do you think is the major drawback of this teaching style? | • Maintaining two set of notes is time consuming.  
• Students can get complete set of notes from others. |
| Do you think this teaching style can help to capture the students’ attention? | • Agree (5)  
• Neutral (0)  
• Disagree |

**Table 3. A summary of the results from the survey on using the ‘ink annotation’ feature in PowerPoint.**

<table>
<thead>
<tr>
<th>Teaching Style: Using ink annotation on PowerPoint</th>
<th>Summary of results</th>
</tr>
</thead>
</table>
| How frequently do you make use of this style? | a. Almost every slide (4)  
b. A few times per lecture (3)  
c. Never (0) |
| How frequently do you use the whiteboard/blackboard feature in PowerPoint? | a. Quite frequent (1)  
b. 1-2 times per lecture (2)  
c. Never (4) |
| Do you think this teaching style helps in term of delivery (i.e. make the material easier to understand, less use of animation etc.)? | a. Agree (7)  
b. Neutral (0)  
c. Disagree (0) |
| Do you think this teaching style can help to capture the students’ attention? | a. Agree (7)  
b. Neutral (0)  
c. Disagree (0) |
| Why do you make use of this teaching style? | • Easier for student to follow the steps.  
• Easier to highlight points than a laser pointer.  
• Add more variety during the lecture. |
| What do you think is the major drawback of this style? | • PowerPoint slides can be messy after many annotations.  
• Needs practice to make one’s writing legible.  
• Can forget to mention some points.  
• Technical limitations (e.g. resolution is not good enough for certain drawing, sensitivity of stylus pen). |
Conclusion

In this article, I have surveyed the common lecture styles and suggested a possible way to incorporate the charms of a traditional whiteboard/blackboard lecture into a lecture delivered using PowerPoint. The proposed technique should break the mould of typical PowerPoint lectures that incubate a detached attitude in both lecturers and students towards lectures. By using separate sets of lecture notes with real-time annotation, the lecturer can capture the students’ attention and make their lectures more effective sessions for learning.

References
