Abstract: The method utilizes two PowerPoint lecture presentations – a complete version used by the lecturer, and a corresponding partial version available in advance to the students. Pre-prepared lecture presentations allow for an easy control of exactly how much of the lecture material students are privy to prior to class time. The benefits for the students: (i) absenteeism is discouraged; (ii) skill of taking notes is still practiced; (iii) the organization of the material and the notes is obvious. The large time investment in creating and animating the lectures is outweighed by easy editing, refining and sharing.

Introduction: Academic lecturers face many challenges today\(^1\):
- large class sizes and multiple sections in large courses
- variable abilities, interest and motivational levels of students
- absenteeism
- poor performance, increased course drop rates and course repeating
- variable access to technology

Delivery methods very often decide how popular the course is and how successful the lecturer is in the transfer of knowledge. Historically, lectures were delivered by the lecturer standing in front of the class, often behind some sort of a partition, delivering notes on the blackboard. This method could be very engaging and flexible, as it allows for questions to be posed by the lecturer and students to be worked into the lecture. On the other hand, students must write and listen at the same time, and therefore, often miss some important details. Also, class missed means no notes! Notes on acetates hand written while in class or pre-prepared and subsequently “revealed” to students are common modifications of this traditional method. Providing complete lecture notes (packages) eliminates the need to take copious notes and allows to focus on the lecture material, but introduces an increased risk of absenteeism, increases the cost of course materials, does away with the practice of note taking, and for some less mature students often means a misconception that what is not in the notes is not required. A compromise between these two diametrically different methods of lecture delivery is the use of partial lecture templates.\(^2,^3\)

Lecture Templates: Several software packages, such as Microsoft PowerPoint and Apple Keynote, are currently available for preparing and delivering lecture presentations in academic settings. While textbook publishers include PowerPoint lecture packages as part of the ancillaries and course management systems, many lecturers choose to develop their own lectures and adjust them for the depth of the lecture material, degree of preparedness and motivation of students in their classes and desired student participation. We have used lecture templates which utilize two forms of PowerPoint lecture presentations – a complete version used by the lecturer during classes, and a corresponding partial version available in advance to the students in undergraduate and graduate chemistry courses. We have paid attention to the type of information included in the partial notes as well as to what we believe students should write by themselves in the spaces provided. Making some information available to students dramatically decreases the amount of time students need to read ahead to take notes in class which allows them to focus on the material being explained. Another benefit is that it provides structure and organization.
As can be seen from the above table, the students must still write down the most important information. Because lecture templates are detailed enough and can make frequent references to features in the textbook (such as pages, formulas, figures, tables, appendices, etc.) they can serve as a guide for students who wish to read ahead or have missed a class. On the other hand, these templates are not complete enough to encourage students to habitually miss classes. Most of the information that students put in empty spaces is displayed on the screen, in class, as part of the lecturer’s complete version and is not available to students at any other time. The lectures are animated and paced depending on class response. Each page can be animated to a desired detail, even one character at a time, easing initial skepticism (in both students and faculty accustomed to the more traditional methods) that an extensive use of lecture delivery technology may not be appropriate at an early undergraduate level. Essentially, a pre-prepared lecture presentation displayed on the screen can be as good and detailed as if it were written by hand, but without the bad handwriting! In addition, lecturer can also add and point to features on graphs or plots (available to students in a partial form), temporarily highlight text, connect information or re-hash parts of a lecture. Individual lecturers who share notes can make some modifications to the lecturer’s version while staying within the agreed upon framework.

All in all, students appreciated the effort that went into preparing textbook specific PowerPoint lectures and generating the corresponding lecture templates. Here are a few unedited comments from students in the General Chemistry course:

- “These Powerpoint lecture notes are a convenient way of providing notes for each chapter. They help me to follow along with the teacher’s lectures.”
- “In my opinion, the lecture templates make learning chemistry much easier. Instead of worrying about taking notes and wondering if you wrote the important information down, you have exactly what you need to know right in front of your face.”
- “It also makes it easier to catch up in class in case you have to miss class”

In summary: We found that this way of lecture delivery helped us to stay on the topic, to cover more of the required material (a very important aspect in team taught courses with common final exams) and to provide the structure and organization many of our students were lacking. Seeing this organizational structure as well as still having to take partial notes helped students improve their note-taking skills.

References: