Teaching outside the Textbook: a multimedia approach to teaching statistics tutorials

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Introduction

I teach business statistics to second-year university students, all of whom are with me because statistics is a required course. Most of them start the semester nervous of the conceptual challenges that statistics offers. There is clearly a motivation problem here for both students and instructor. The textbooks do not help much, written as they are in a dry, technical manner. One can hardly blame the authors for that, because being dry and technical is the only way in which they will get all that content between two covers.

My contention is that today's instructors should look beyond the two covers and consider using today's tools (Smith, 2007). The written word, in the form of a textbook, remains the cornerstone, but the textbook is just one of a range of possible instructional media. As Smith points out, 'teaching today's students requires communicating with them and keeping their attention while they live their lives in high gear, with access to music, video and friends on demand' (Smith, 2007). We have only to look around to see our students communicating and learning through different modes, sometimes simultaneously (Billings, 2009). Why not use and adapt to their needs? As Kagima and Hausafus (2001) observe, 'by using familiar technology environments, today's faculty can cultivate a learning environment in which they can better reach today's students'.

There does seem to be some merit in comments such as those of Kagima and Hausafus (2001), at least on an anecdotal basis. For the past year, I have given my students a choice of different media with strong encouragement to pick and choose as they wish. The lectures go on as usual, and the additional media are merely supplements to the lectures. As Brooks (2003) points out, in the classroom 'the live non-verbals can be captured instantaneously' but this does not mean that the teaching relationship ends at the classroom door. My students have welcomed my provision of supplementary media, and I am working on further techniques. I currently provide two electronic media to support my lectures. These are screencasts, delivered through

Youtube; and downloadable mp3 audio files. I describe the two media in more detail below.

Screencasts

A screencast is a short video, frequently tutorial in nature, which is delivered to the user's computer screen. Youtube is the well-known video-sharing site, and very familiar to my students. I record screencasts of some lecture content, typically of some statistical calculation, and then upload the screencasts to Youtube. I provide my students with a document containing links to the screencasts, structured according by lecture sequence. I have found my technique helpful to both my students and myself, particularly when the topic requires some repetitive action. For example, my statistics courses are taught in computer-equipped classrooms, with considerable use of the spreadsheet program Excel. Some Excel procedures can be intricate and it is easy to make a misstep. As Excel proficiency is tested during examinations, the students pay close attention to the classroom demonstrations and exercises, but tend to forget once the class is over. The screencasts allow them to review and practice at leisure, and I am no longer required to keep repeating the methodology. I am of course not alone of course in providing materials in this way. Agazio and Buckley (2009) describe the potential for the use of Youtube in nursing education as 'an untapped resource', while Desmet (2009) describes how students can learn to appreciate Shakespeare through Youtube.

Youtube is an open-access resource and my screencasts are therefore available to anybody. Some screencasts have been viewed well over a thousand times, and I receive helpful comments and tips from all over the world. I am not alone in providing such free help; there are several other sets of statistics lectures available on Youtube, but these appear to be more theory-based than mine, which concentrate on using software to solve problems. One unintended advantage of making my screencasts widely available is that as a content provider I gain some statistics concerning the physical location of my viewers and frequency of viewing by month. I have graphed the total number of 'views' of my top five screencasts, and the results appear below as Figure 1.

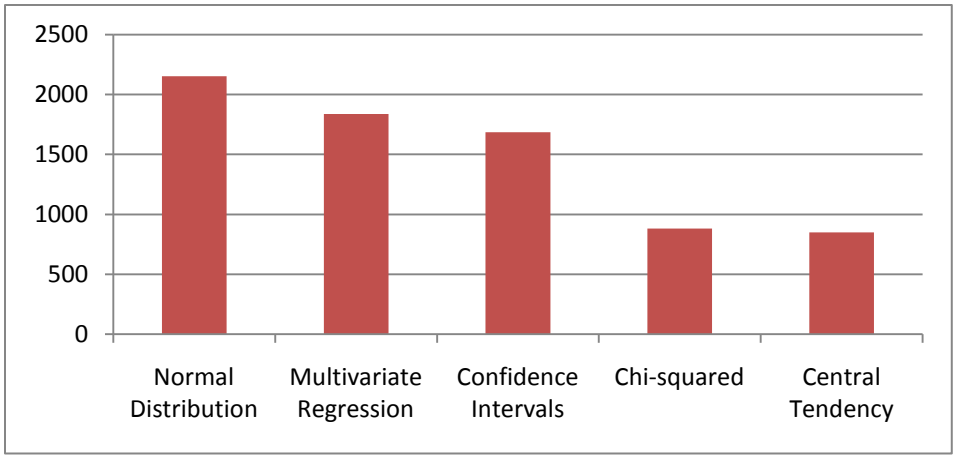

Figure 1. Top five most-viewed screencasts by topic. The vertical axis indicates the number of views since the screencast was made available on Youtube.

Each of the five screencasts is about the same length (approximately five minutes) and was uploaded in the same time-frame. It is tempting to suppose that the most viewed topic is the one that students find most difficult, but there are many potentially confounding variables. There is clearly scope here for interesting research, some of has been begun in the health sciences (Burke et al., 2009).

Audio files

My second electronic medium is the recording of audio on mp3 files. The recordings consist of me talking through my lecture slides, spending just enough time on each one to make sure the take-home message is clear. Each file is about fifteen minutes long, which is about half the time it would take to deliver the same content in a classroom. If the lecture content is especially long, perhaps more than twenty slides, then I break the recording into two files. The students download the files onto their personal players, and then (they tell me!) listen while on the bus or are otherwise engaged. The slides are available to them and so they can follow along, slide by slide. On enquiry, I found that a wide range of students listened to the files, from those who were struggling and who needed the opportunity to listen again and again, to the capable who wanted to do some last-minute revision. The audio files are available only to students registered in my classes, and because they are highly lecture-specific it is doubtful whether they would be of interest to a wider audience.

Software

The software I use is easy to obtain. For the screencasts, I use a proprietary program called Camtasia. I understand that there is now some free software (such as Jing) available. The screencast files can be uploaded to Youtube from any computer. For the mp3 files, I use a free program called Audacity, which is free and simple to manage.

Next steps

I feel that I have probably sufficiently exploited the mp3 and screencast modes of delivery. These two media have the limitation of being simply extensions of the parent-teacher relationship. They make learning easier for the student, but do not by themselves stimulate curiosity or the desire to make interesting advances on an individual basis. The advent of the more interactive capacities of recent web developments, such as the Wiki, may help in this regard (Duffy, 2007). I am currently working on a scheme for a Wikistats, written and edited by my students. The degree of professor oversight is an interesting issue; too much and the exciting opportunity for peer-to-peer exchange and learning is stifled, while too little oversight might result in potentially damaging inaccuracies.

Conclusion

I have found that the provision of learning materials other than the traditional textbook to be helpful to my students, but I have not yet been able to quantify the benefit. In addition to the direct benefits that students gain from receiving instruction through the media with which they are most familiar, there is an indirect benefit. This is

that the students recognize that the instructor is doing her or his best to provide them with materials suited to their needs. The techniques are simple to master, and the instructor can save valuable time by simply not having to repeat rather tedious materials. Everyone benefits. There is considerable scope for further work, especially in exploiting the more interactive features of the Web, such as the Wiki. To see my screencast tutorials, go to www.youtube.ca. Then search for 'stephenpeplow'. Thumbnails of my screencasts will then appear. I would very much appreciate constructive criticism, especially suggestions for measuring the effectiveness of such non-traditional content delivery techniques.

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