

Narrated PowerPoint as a Self-Learning Resource

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Abstract: In addition to being used to create lecture room slides, PowerPoint can also be used as a simple entry-level medium for creating self learning resources for students. This article explains the concept of using narrated PowerPoint slides as a teaching resource and examines some of the advantages and disadvantages of using PowerPoint as the medium for this kind of learning object. Feedback from staff and students who utilised such a resource for a business statistics class is provided and discussed, together with thoughts of future research into the effectiveness of narrated self-learning tools and the appropriate mediums for them.

Keywords: Narrated PowerPoint, Self-learning, Multimedia Instructional Tool, Learning Object

Introduction

THE USE OF PowerPoint has traditionally been limited to the lecture theatre, however, the programme also provides a simple and familiar interface for producing self learning resources for students. This kind of resource is particularly useful for helping to engage with students in distance learning courses, although it is equally valuable as a self-learning resource that can be used to supplement lecture or classroom activity.

Rather than thinking of PowerPoint as a presentation programme, we can think of it as a very simple tool for creating student centred, interactive learning resources. It requires no programming skills and is a programme which is already used by many educators, so no additional time is required to learn the programme. Educators can include graphics, sound and video and present it in a non-linear fashion in order to create a self learning resource. Although this article is aimed predominantly at educators who do not have a background in programming or more complex software programmes, the more technically proficient readers of this article will hopefully still be able to take some of the ideas discussed and extend them through the use of their superior software skills.

To assist students, particularly those who are not native English speakers, with the topic of hypothesis testing in a first year business statistics class, a set of narrated PowerPoint slides was created. The slides were provided as a supplementary, self-learning resource which students could work through at their own pace. A sample slide is shown in Figure 1. The slides featured the theory relating to hypothesis testing, together with fully worked examples and interactive questions for the students to attempt. Each of the slides has a "Play Voice" button, which activated the narration for the slide. The goal was to use

the full extent of the capabilities of the technology at hand, in this case PowerPoint, to create an effective learning resource [1].

Following a short discussion of the pedagogical ideas behind the resource, the article will detail the creation of the resource, the advantages and disadvantages of using this technique and the feedback from the lecturing team and from the students. The potential for future research and possible improvements to the resource are also discussed.

Pedagogical Considerations

As an educator, it seemed prudent to consider the relevant pedagogies before proceeding with the construction of the resource.

Mitchell's article about combining real and virtual learning environments to cater for individuality in learning [2] provided a good starting point. It focussed on individuality and diversity and discussed how the different learning styles of students were an important consideration as they could affect the success of being able to meet learning outcomes with an e-learning resource.

Whilst there is a plethora of literature of different theories on learning styles, many of which contradict one another, particular consideration was given to Honey and Mumford's personality types (activist, reflector, theorist and pragmatist) [3], Kolb's cycle of learning [4] and most importantly the idea of visual, auditory and kinaesthetic learners. Although it is difficult for a resource to be all things to all people, the ability of narrated slides to convey information both visually and aurally, with theoretical and interactive practical examples suggests that it can be an effective medium for a diverse group of students.

Karampiperis *et al.* [5] take the concept of learning styles into the 21st century by examining the cognitive traits of the users of their hypermedia learning



objects in order to tailor the learning experience to each individual. Although this would be more difficult to do with PowerPoint as the medium of deliver, the article provides a good demonstration of the need to cater to student diversity within an e-learning environment in the same way that you would within a classroom.

Coffman [6] states that making interaction an integral part of the learning process helps to students to take responsibility for their learning. These sentiments are echoed by Ramsden [7] who discusses the need for stimulation in the teaching/learning environment. These thoughts strongly indicate the need for a resource with a strong interactive element rather than a passive, lecture equivalent. In addition to providing the relevant interactive content and theory of the topic, the information must be provided within a context that demonstrates to the students why it is relevant to them. Contextual learning is an important but often overlooked factor in e-learning tools which must be addressed in order to maximise the potential of a learning object [8].

From a subject specific level, the use of learning objects has been shown to have a positive impact on student results and the overall level of engagement of students [9]. Hunt and Tyrrell's [10] discussion of utilising new technology in statistics education reinforced the strong potential that learning objects

and e-learning can have when applied appropriately. Their caveats echo the sentiments of discussed above; ensuring that resources are interactive, easy to use and cater to a diverse student population.

One final educational notion that was considered during the construction of the slides was the idea of statistics anxiety in the students [11]. Statistics anxiety is defined as "the feelings of anxiety encountered when taking a statistics course or when doing statistical analyses: that is, gathering, processing and interpreting data" [12]. Statistics anxiety has been shown to have a strong negative effect on the success of students in statistics courses, so for the resource to be effective it would have to reduce the anxiety levels of the students by being easy to access, easy to use and easy to understand.

Producing Effective Narrated Slides

The goal of the slides is to create an effective self paced, student centred learning resource for on-campus and distance students to learn from. By using buttons on the master page to link the slides (as seen on the left in Figure 1) you get the same effect as "frames" in a web page. This creates a non-linear environment where students can choose the section they wish to examine.

The slide content includes:

- Unitec NEW ZEALAND logo
- ALAF 5401 – Business Statistics
- 2 Sample Hypothesis Tests
- experience REAL WORLD LEARNING
- Introduction
- 9 steps of a 2 sample test
- 2 sample test by hand
- Questions
- 2 sample test using Excel
- Questions
- Glossary of Terms
- Play Voice
- Stop Voice
- Relax & listen to some guitar

9 Steps for Conducting a Hypothesis Test

1. Establish Null & Alternative Hypotheses
2. Choose **significance level** α (usually $\alpha = 0.05$).
3. Decide which test to perform
4. Determine the **critical boundary statistic**
 - 5a. Find the sample statistics eg \bar{x} , n and s
 - 5b. Calculate test statistic
 - 5c. Compare test and critical statistics
 - 5d. Reject null hypothesis if result is significant
 - 5e. State conclusion of test.

Figure 1: Sample Narrated Slide for a Business Statistics Course

The narration doesn't require any expensive equipment or software to produce. It can be recording us-

ing an inexpensive microphone and the Windows sound recorder. A slightly better sound quality and

the ability to edit sound files can be gained from using a freeware sound editing package such as Audacity [13].

The nature of PowerPoint allows any jargon terms to be included as hyperlinks that take the student to the glossary for a definition of the term. In Figure 1 we see the terms “significance level” and “critical boundary statistics” are highlighted as hyperlinks, which link to the glossary page so that a student using the resource can check on the definition of each of the terms as they go.

So that the slides aren't completely serious, the bottom left button plays some original guitar pieces before remind the students that statistics is fun. By personalising the resource and adding humour, the students are more motivated to use it [14].

Advantages of PowerPoint as a Medium

The main advantage of using the PowerPoint programme is that it is widely available [15] and therefore in most cases it will require no special training. The simplicity of the interface makes it convenient and familiar for educators to use and for students to run. Using PowerPoint allows for convenient linking to the other Microsoft Office programmes, in particular Excel. Linking the slides to macro enhanced Excel files allows students to not only view the theory of hypothesis testing but to also be able to use Excel to conduct their own tests. Excel files can be set up to include data and macro driven demonstrations of how to perform the test.

Disadvantages of PowerPoint as a Medium

Whilst PowerPoint is a convenient medium to use for producing narrated slides, it is not necessarily the best possible software programme to use. Unlike a genuine programming language, it lacks the ability to add complete interaction. There are also drawbacks with regard to file size and performance for larger presentations

Once the audio files had been attached to the slides, the PowerPoint file was over 100 megabytes, making it too large for convenient web based distribution. In order to provide it to the students, it had to be placed on a shared network drive so that they could either burn it to a blank CD or copy it onto a portable flash drive. This is not ideal as it requires more time and effort for the students than if they were able to download the file from the web with the rest of their course materials. A PowerPoint file of this size is also quite slow to load on slower machines, which makes it of less use to students with older computers at home.

PowerPoint allows for linking to other slides in the file, web pages and Excel files and it interacts easily with the other programmes in the Microsoft Office suite, but it is not a genuine programming language, so does not provide genuine interactivity. It would be easier to produce genuine interactive material such as quizzes and student-centred activities in a dedicated programming language such as Java. Java scripts can easily be inserted into HTML code and do not require much programming experience to create.

Student and Lecturer Feedback

When examining any educational resource, we should examine it from the perspective of the student and from that of the lecturer. For the narrated PowerPoint slides, the feedback was very positive from both parties.

The student feedback regarding the slides has been very positive, particularly from the international students. A number of them already used voice recording devices in lectures, but the slides provided them with both audio and visual material. They appreciated the fact that they could replay the narration at their leisure and work through the slides at their own pace. Students comments included: “I like it. It is easy to read and understand (step by step and examples)”; “It is helpful to easily understand Hypothesis, especially with examples”; “helped me absorb the knowledge much better”. The feedback from international students indicated that this was a very useful resource for them and helped to overcome language difficulties that they may have encountered in-class.

The lecturers involved with the paper found that there was a noticeable improvement in the marks for the hypothesis testing sections in the assignment and exam in the first semester that the slides were introduced. When marking the assessments they found that a greater percentage of students appeared to genuinely understand the topic rather than just trying to regurgitate answers that looked similar to class examples.

No quantitative data was taken to compare the results of students who used the slides with those who did not, however, it has been shown that the integration of effective multimedia based instruction has been shown to enhance understanding, particularly in a multicultural context [16]. The anecdotal evidence from both students and lecturers has been very positive and suggests that the narrated slides are an effective educational resource.

Further Research and Changes to the Slides

There are two obvious follow-ups to this paper. The first is to quantitatively examine the pedagogical effectiveness of the slides. The second is to look at how the slides could be further expanded or improved.

From an analytic point of view, a formal comparison of student success in the topic, with and without the use of the slides would add significant evidence to the effectiveness of the resource. There is strong anecdotal evidence but a quantitative comparison would provide a better idea of the improvements that can be delivered by this resource.

The narrated slides pushed PowerPoint close to the limit of its capabilities, with the files reaching an unwieldy size and being slow to load. It would make sense for further improvements to this resource to take place within a more suitable software setting. Whilst PowerPoint is appealing as an initial programme, given that it is widely available and familiar to many educators, there are other programmes which would prove to be more effective in the long run. Two mediums that are still relatively easy to produce, but more efficient in terms of file sizes would be HTML and Flash. Similar resources could be produced with either of these programmes without too much additional effort, whilst reducing file sizes

which would make them more suitable for web based distribution.

Conclusion

PowerPoint is a convenient starting point for developing narrated learning objects and ultimately being able to examine their pedagogical effectiveness. It provides a simple interface for users to develop learning objects without the need for specialist software or programming skills.

Although the pedagogical effectiveness of the narrated slides described in this article has not yet been measured in a quantitative sense, there are strong indications that it is a valuable resource for students learning statistics. Based on the student feedback and anecdotal evidence from marking the assessments, the set of narrated slides has been an effective tool for assisting all students, but particularly those who speak English as an additional language, in learning about the topic of hypothesis testing.

The collection of quantitative data regarding the effectiveness of this tool will reinforce the anecdotal findings of this paper although hopefully the innovative use of the PowerPoint which illustrated in this paper will already provide inspiration for more educators to start developing learning objects such as narrated slides for their own courses.

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