Title
Rethinking PowerPoint for Active Learning: If we do what we’ve always done, we’ll get what we always got.

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OVERVIEW

Overview, Aims and Context
After a faculty-wide review of how Lecturers use PowerPoint and student perception of this, we designed a pilot rethinking its use. The aim was to foster a more active and participative approach to learning which also dissuaded a dependence by lecturers and expectation from students for text-heavy PowerPoint presentations.

Description
A review of the role of PowerPoint within the learning and teaching practices of the UUBS as a whole was undertaken. This involved a focus group with lecturers from across disciplines at each campus (Jordanstown, Magee and Belfast) followed by a Faculty-wide staff survey completed by 60 staff. A focus group with students was also undertaken.

Based on the findings of this review, we developed a pilot project in the initial three modules undertaken by first year BSc (Hons) Management and Leadership Development (MLD) students, rethinking the use of PowerPoint to facilitate a more active and participative pedagogic approach (PowerPoint for Active Learning, PPAL). Guidelines for the design and use of PowerPoint presentations were developed based on the literature e.g. Mayer’s (2001) multimedia learning. These radically reduced text and emphasised the use of imagery. In addition, Active Learning Worksheets for each lecture were developed. These sheets included key learning questions ranging from the formation of key definitions and evaluation of certain concepts or theory, to solving problems or set calculations.

Lecturers for the three modules met initially and then subsequently throughout the semester to ensure a standardized approach to their usage of PowerPoint and Active Learning Worksheets with the aim of delivering a holistic student experience.

Design
Qualitative and quantitative evaluation was undertaken to evaluate this pilot study utilizing a between-subjects design with the BSc (Hons) MLD students moving into second year serving as the
control group and the students that joined the course in September 2016 serving as the experiment group.

A focus group with a sample from the control group was undertaken in September 2016 as they were about to move into year 2. This explored their experiences of teaching and learning, engagement and the use of PowerPoint within their first year at University, particularly their first semester. A second focus group was conducted in January 2017 with a sample of students from the experiment group at the end of their first semester, with the intention of exploring their experiences of the new teaching and learning strategy. Each sample consisted of 8 students.

Focus groups were facilitated by a member of the project team not involved in programme delivery.

Quantitative data relating to student performance and attendance was collected for both the control and experiment student groups as a whole. This included analysis of weekly attendance and student performance.

In addition, the three lecturers involved in PPAL delivery completed a reflective account of their experiences in January 2017.

RESULTS

Findings and Conclusions:

Stage 1: Review of PowerPoint within the Faculty

Research shows that PowerPoint is widely adopted in Higher Education (Craig and Amernic, 2006; Roehling and Trent-Brown, 2011) and this was replicated in the Faculty review. 85% of lecturers surveyed estimated that they used PowerPoint to support 9 or more of their lectures in a typical 12-week module. There was a consensus among lecturers that students both expect and prefer PowerPoint presentations to be used.

PowerPoint has been shown to have “no measurable influence on course performance and minimal effect on grades” (Hill et al. 2012: 243) and in experimental studies, students retained 15% less of the information delivered verbally by lecturers when verbal content was accompanied by PowerPoint (Savoy et al., 2009).

Fig 1. UUBS lecturer perspective on PowerPoint supported vs traditional lectures

When asked whether students who attend lectures supported by PowerPoint presentations perform better in assessment than students who attend “traditional” lectures (e.g. “chalk and talk”), as shown in Fig 1 above, 40% of UUBS lecturers incorrectly (based on the research cited above) stated they did significantly better or better with PowerPoint. Interestingly, given usage, 35% stated they didn’t know or hadn’t considered this.

Lecturers from the focus groups reported concerns around student attendance and engagement:
“My concern in first year is that you give them everything in PowerPoint...they then don’t attend because they think they have it all, you hope that doesn’t happen in final year, but I think it does, and that would be my concern, and I do think we need PowerPoint but think we need to think about how to use it so as it’s not seen as an alternative to the lecture. Should be a support, not an alternative.”

“My concern would probably be, if all the slides are there that there is a lot of people sit at the back of the room and don’t engage and don’t understand what is being talked about in class, and then, you know, I’ve had examples of, they will ask me stupid things.”

Students from the focus group reported their expectation that PowerPoint would be used, confirmed that it provided a structure to the lecture adding that it allowed them to re-join a lecture should they get lost or check a point they had missed. While some students did mention the availability of PowerPoint as a significant factor in their decision to miss a lecture, they reported their decision would be more often based on their experience of particular lecturer’s use of PowerPoint. There was a consensus among the students that they didn’t want excessive text in the slides or a de facto textbook chapter. They cited the best lecturers’ slides to be concise; going so far as to discuss one lecturer whose slides would “just be key words and then he would talk about them” or another who used the slides: “like a skeleton... and then embellished their own [content]”. In contrast, they described how, with excessive text, it would be:

- “Like pick a wall and look at it, and after a while that’s just what it felt like, [the text] just did not go in, like it was horrible”.

Stage 2: Evaluation of the PPAL pilot

Qualitative Findings - Student Focus Group

Three key themes emerged from the focus group with the students from the experiment group.

Firstly, students discussed the importance of attendance: “It was very important [to attend] because a question came up in the exam for one of the lectures I didn’t attend and I didn’t know how to answer it”. Although, and perhaps of concern, some reported this was partly based on fear: “You couldn’t catch up. If there was notes you missed you couldn’t go back and get them so attending was just easier”.

Secondly, there was a significant number of comments focused on positive engagement created through the redesigned slides which emphasised imagery and minimised text:

- “I like more creative things, I liked the pictures better so...put up a picture and talk round it”
- “The pictures helped you remember information”
- “The slides were simplified but it was good...[the lecturer] engaged you with the way they would speak about the topic”

The students also reacted positively to the Active Learning Worksheets: “I liked them, to be honest I would prefer having them [worksheets] to the slide handouts”.

Lastly, students reported the redesigned slides and Active Learning Worksheets as significant aids in preparing for and undertaking assessment:

- “I think the way they did it too made it easier to remember because whenever you were revising it you could be like ‘that was the day they had this picture or that diagram’”
- “Each assignment you could go to the point on the worksheet and know what information you needed for it...it gave us a basis of what our plan was going to be for writing the assignment”
- “It was easier to go over exam stuff from the worksheets”

Qualitative Findings - Course Delivery Team Reflections

Feedback from the course delivery team centred around 3 key themes namely, student engagement, self-reflection and time commitment.
One of the most frequent comments made by the course team related to student engagement with all of those involved noting a marked improvement in the degree of engagement in class:

- “I thought engagement in class was definitely better. There was more discussion, the slides were less ‘important’ or central to the lecture... in previous years, I have noticed students rarely taking notes in lectures and I definitely observed them taking more notes within this module. I also found some of them to be discussing the content of the lecture during the break or after class” (Lecturer 2)
- “The lectures became much more interactive and less didactic in nature. I found that we were discussing issues more than I would have found previously...Students seemed to be less reliant on being spoon fed and were also more interested and awake for want of a better word” (Lecturer 3)
- “I noticed a tangible improvement in student engagement, it was the first time in a while where I really felt like the majority of the class were in the room and participating in the lecture and engaging with the content being addressed” (Lecturer 1).

Reflections also indicated that the pilot project initiated a period of self-reflection among the course team with one lecturer noting how “lazy” PowerPoint had made them. Similar sentiments were shared by the other lecturers with all of them feeling as though the new alternative approach offered a positive experience and an opportunity to look at and revise their use of PowerPoint resulting in benefits such as greater enjoyment in the teaching experience, feeling more engaged in class themselves and being better prepared and able to discuss concepts and points at a deeper level.

Despite the very positive reflections offered there were also some challenges identified and questions raised. Firstly, all of those within the course team referred to the time commitment required in developing the resources necessary for the new approach to PowerPoint i.e. developing Active Learning Worksheets, stripping back PowerPoint slides and replacing with suitable imagery, developing robust supporting notes for delivery. That being said, it was suggested that upon delivering the content again the time required for preparation of such resources would likely be less. Lastly, while the pilot project was designed in a way that meant students did not have access to the slides used in class, in the wake of persistent requests for access to the slides from students, questions have been raised as to whether this was the correct approach.

**Quantitative Findings – Performance**

<table>
<thead>
<tr>
<th></th>
<th>Experiment Group</th>
<th>Control Group</th>
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<tbody>
<tr>
<td>Semester 1 Average Performance</td>
<td>63.1%</td>
<td>63.2%</td>
</tr>
<tr>
<td>Year 1 Average Performance</td>
<td>61.4%</td>
<td>59.9%</td>
</tr>
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Disappointingly, as can be seen in Table 1, no significant differences in performance were found between the Experiment and the Control groups. However, this is in keeping with the literature previously cited by Hill et al. (2012) amongst others, that PowerPoint makes no discernable difference to student course performance. From a positive perspective though, lecturers can have confidence that stripping text out of their slides and even moving away from a dependence on PowerPoint should have no significant impact on student performance.

Fig 2. Attendance in Semesters 1 and 2 for the Experiment and Control Groups
Attendance dropped by 8% from semester 1 to semester 2 this year (the Experiment Group) compared to a drop of 17% in attendance from semester 1 to semester 2 the previous year (the Control Group). The difference between semester 1 attendance for the Experiment and Control groups was not significant but the difference between semester 2 attendance was.

The lecturers, assessment, attendance monitoring and attendance meetings were all identical in semester 2 for the Experiment and Control Groups. The PPAL pilot was purposively not continued in semester 2 so the learning materials were also exactly the same.

It could be argued that the difference in semester 2 attendance was due to naturally occurring or random differences in the groups e.g. the experiment group was just a better group, however, the entry criteria was the same, there was no difference in the UCAS points between groups, age profile was similar and if we look at semester 1 attendance, it was 79% for the experiment group while the control group was identical at 82% (p > .05) so both groups were equally good attenders in semester 1. This would suggest that the groups were similar. Lastly, when we looked at the year before the Control Group, the attendance drop between semester 1 and 2 was markedly consistent.

With these factors in mind, it would seem then that a habit or culture of attendance was embedded in the Experiment group that wasn’t in the Control group the previous year.

Conclusions

To summarise the findings and discussion presented above, the review indicates that PowerPoint remains one of the most dominant technologies utilised by UUBS lecturers, consistent with the published results. There was some concern among lecturers regarding students placing an overemphasis on the PowerPoint slides. Students reported an expectation that lecturers would use PowerPoint but did not want this to be excessive or for lecturers to be overly dependent, particularly on text heavy slides.

In this context, the PPAL was developed with the intention to return the point to PowerPoint.

The lecturing team reported that the pilot project requires time but felt there was a positive impact on engagement. Students too reported a positive perception of the project in terms of attendance, engagement and assessment. Quantitative data suggest the project had a substantial impact on attendance and that lecturers can be confident in rethinking their usage of PowerPoint as no detriment to performance was detected – rather a more selective and proactive approach may have benefits in terms of student engagement and overall student (and staff) experience.

EVALUATION

Reflective Commentary

Our reflections in many respects mirror those of the course team presented above within the qualitative findings.
The PPAL pilot worked well in terms of gaining evidence of engagement from the students, developing a culture of attendance that carried into semester 2 and showed that radically stripping out text from PowerPoint slides used in lectures had no impact on student performance which hopefully offers confidence to move away from passive PowerPoint as the dominant supporting technology as we transition into the other more active and proactive Learning Landscape initiatives.

An unexpected benefit was that the pilot project initiated a period of self-reflection with one lecturer noting how “lazy” PowerPoint had made them. Similar sentiments were shared by the other lecturers with all of them noting how the new alternative approach offered a positive experience and an opportunity to look at and revise their use of PowerPoint, much to the benefit of the students involved.

As noted above, despite the very positive feedback offered there were also some challenges identified and questions raised that would need to be taken into consideration.

Firstly, all of those within the course team referred to the time commitment required in developing the resources necessary for the new approach to PowerPoint i.e. active learning sheets, stripped back PowerPoint slides, robust supporting notes, etc. Some common uses of PowerPoint as reported in the literature, in the staff survey and by the lecturers involved in the pilot included the use of slides as: speaker notes; a way to facilitate student engagement; and an assurance that students had been provided with adequate coverage of the material that they could refer to post lecture. Redesigning PowerPoint required confidence to move away from these perceived benefits and in practice, this was more difficult than the team had first perceived.

Secondly, while the pilot project was designed in a way that meant students did not have access to the slides used in class, in the wake of persistent requests for access to the slides from students, questions have been raised as to whether or not this is the correct approach. In hindsight, we would incorporate the slides into the active learning worksheets. In particular, the imagery of the slides served as a useful visual anchor for content for students and as one delegate at our workshop at the CABS LTSE 2017 conference noted, why not provide the slides.

**Student Engagement (to be completed by the student partner):**

The student partner for this project was Amy-Joy McConville, final year BSc (Hons) HRM student as we did not wish to use a student from within the pilot group.

This project does seem worthwhile, some but not all lecturers can overly rely on lots of slides or a lot of text. It was good that this was introduced to all modules in semester 1 of first year as it is a significant change in how lectures are delivered and students will have to take a lot more notes. I would not want to see this brought in final year without an opportunity to get used to it in previous years. Students will need supported to learn how to take effective notes and it is good that the team included sessions on this within the student induction. I can see how this type of approach will require students to engage more in class, ask more questions and work with others in completing their notes which should help the learning experience and sense of belonging.

**Learning Environment and Engagement:**

The Learning Landscapes initiatives present exciting opportunities for our University. However, we were concerned about the extent to which such projects will succeed when rolled out beyond the enthusiastic ‘Early Adopter’ lecturers who pilot them.

To illustrate with a recent example: a room on the Jordanstown campus is currently part of a University wide pilot in which seating and tables have been reorganised from traditional lecture style to circular tables, seating six students facing each other with whiteboards and other resources. Despite the benefits of such a layout for participative and interactive learning, we are aware of
negative feedback from a student group via the Staff Student Consultative Committee on the basis that their necks were physically strained from repeatedly turning their heads to see the PowerPoint slides being displayed. Such feedback clearly reflects more on the teaching methods being utilised by some of the lecturers within this new learning space rather than a failure of the new teaching room layouts. Similarly, whilst digital apps, flipped teaching and other such innovations are important and valuable innovations, they are likely to encounter similar problems in practice if our pedagogic approach has led students to expect teaching supported by extensive, text heavy PowerPoint presentations.

Our review in stage 1 shows that PowerPoint remains as the dominant ‘supporting technology’ still used in the Ulster University Business School and we suspect the University more widely. Our pilot in stage 2 shows that rethinking our use of PowerPoint can foster a more active and participative approach to learning. It led to an improvement in attendance and showed no detriment on student performance. This refreshed approach, if employed more widely, should then serve as a stronger enabler for other innovative projects and the continued development of the new Learning Landscape for the University.

Impact

The project sought to improve learning and teaching in practice as well as develop pedagogic theory in terms of the use of technology and its impact on student engagement and active learning.

For those academics involved in the pilot, data analysis revealed that the activity has had an impact on their teaching and learning practices with all those involved adjusting their use of PowerPoint in light of the experiences gained. Through the dissemination of the project findings several HE practitioners have also indicated that they are considering changing their teaching practices and implementing the alternative approach proposed.

As well as with the academics, the project has also had an impact on the student cohort involved in the pilot. More specifically, the data indicate that the pilot has had a positive impact on their view of class attendance and its necessity in Higher Education. In addition, the evidence also points to improvements in student engagement and participation leading to a more positive learning experience overall.

Detailed evidence of these points can be found in the outline of the qualitative and quantitative findings within the Results section above.

STRATEGIC DEVELOPMENT

Transferability

The project was designed to explore PowerPoint and develop an alternative and more participative approach to its use in the classroom. The alternative approach was adopted within three different module settings each with their own unique content including a more quantitative module. Despite such differences, the pilot approach proved beneficial suggesting that such an alternative approach might be useful across a variety of different modules, courses and faculties. The basic premise and key principles identified through the project are relatively simplistic and open to cross faculty implementation but our review at the outset shows they are not common practice. Furthermore, it is believed that through such implementation and shared experiences the project may be further developed and enhanced.

Dissemination (internal and external)

The process of disseminating the findings of this project have already begun both internally and externally. Focusing on the topic of Active and Digital Learning this year’s UUBS Annual Learning and Teaching Enhancement Event provided the ideal forum to share the findings and insights generated
from this research. Externally the research was presented at the CABS Learning, Teaching & Student Experience Conference in Bristol in April 2017. In both instances, the project and its findings were well received, generating positive feedback as well as providing delegates with access to resources to assist in their implementation of the alternative approach proposed. Such resources included a support pack providing example PowerPoint slides and associated active learning worksheets.

Moving forward, the project team have submitted a proposal to the Active Learning Conference due to be held in September 2017 at Anglia Ruskin University. Attracting leading academics in the area of Higher Education practice and pedagogic research, this conference will also provide a suitable forum for further dissemination of the project findings and a fertile ground for its evaluation and subsequent development.

SUPPORTING INFORMATION

References


ULSTER LEARNING LANDSCAPE Faculty Active Learning Projects

- Paula Burns – Focus group transcriptions – p.burns@ulster.ac.uk
- Clare Carruthers – UUBS Teaching and Learning Coordinator who managed the active Learning Projects within the UUBS and provided support throughout – cf.carruthers@ulster.ac.uk
- Clare Taggart / Beverley McMunn – Advice on cost codes and processing of payments – c.taggart@ulster.ac.uk / b.mccunn@ulster.ac.uk