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POWERPOINT AND PEDAGOGY

MAINTAINING STUDENT INTEREST IN UNIVERSITY LECTURES

Jennifer Clark

Abstract. This author discusses the relationship between the use of presentation software and the maintenance of student interest in university lectures. The evidence of surveyed university students suggests that PowerPoint, used as a presentation tool in university lectures, is pedagogically effective only while it provides variety and stimulates interest in the learning environment. That stimulation can be increased if Power Point is used to bridge the direct and constructivist teaching models.

Keywords: *lectures, PowerPoint, student interest*

Lectures in tertiary institutions can be notoriously boring. The lecturer traditionally talks at students while they take notes without thinking about what is being said. The creative use of information and communication technology (ICT), especially presentation software such as Power Point, can bring renewed energy and changed direction to the lecture format. Better learning outcomes can be achieved in the process by stimulating interest,

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improving note taking, and promoting higher-order thinking. ICT can creatively enhance the lecture and help bridge the divide between direct and constructivist learning models. The key element in the use of PowerPoint as a presentation tool is its potential to increase and maintain student interest and attention to the lecture when combined with active teaching and student involvement.

PowerPoint has not been introduced into the classroom or the boardroom without some fear and trepidation. Much of the literature discussing PowerPoint focuses on the training of users in an attempt to remove uncertainty and encourage confidence in a technocentric environment (Adams and Blauer 1998; Baines

2000; Griggs 2002; Holzl 1997; Walsh and Frontczak 2003). Another body of research examines student use of Power Point as a learning tool. Perry (2003) and Siegle and Foster (2001) report positively on this aspect. Perry (64) particularly argues for the application of PowerPoint to support multiple intelligences. Other researchers measure PowerPoint's effectiveness in student assessment. Here the results are disputed. Reinhardt (1999), Parks (1999), and Lowry (1999) all argued that PowerPoint use produced better assessment scores. Szabo and Hastings (2000, 187) disagreed, arguing that PowerPoint "does not result in superior academic performance." Rankin and Hoaas (2001, 113) also found "there is no significant effect in terms of student performance."

PowerPoint as a Presentation Tool in Lectures

My interest in experimenting with Power Point was specifically related to its use as a presentation tool within a lecture program. I wanted to increase student intellectual participation in the lecture, to move toward a more constructivist, problem-solving approach to learning, and to refigure the staid lecture format in a more creative way. In other words, I wanted to extend the work of Gilroy (1998), who believed "technology may provide one possible key for revitalizing the lecture" (5).

Gilroy recognized that "many students are not receptive to lectures," arguing

that in a technologically driven society "the screen is a fundamental part of their daily routines" (5). It seemed sensible, she suggested, to incorporate modern technology into the old-fashioned lecture format to "create a learning environment that is consistently intriguing" (5). The immediate focus of Gilroy's article is her perception that talking alone is not enough and students today would be happier learning from display, an approach that combines both visual and aural stimuli, sometimes in quite complex ways. The underlying importance of Gilroy's article is her understanding of the connection between learning and the attraction of student interest, in this case, an interest stimulated by a variety of technological forms and techniques including the use of presentation software. Reinhardt (1999) disagrees; she argued that PowerPoint presentations can create a passivity in student learning. Students may not take notes if they are provided for them on PowerPoint printouts; they may fall asleep because the room is darkened to facilitate projection; and they may become "spectators rather than participants in a classroom where the professor 'orchestrates' a multimedia presentation" (49). What both Reinhardt and Gilroy are really beginning to address is the impact of presentation software on students' participation in their learning. Student participation is reliant on the effective encouragement of student interest. Can PowerPoint, as one of the most popular and easily accessed forms of presentation software, be a means to that end? Specifically, can using PowerPoint encourage the development of a constructivist-learning environment? More broadly, can presentation software impact pedagogy in such a positive way?

Technology and Pedagogy

The debate over the impact of technology on pedagogy is not new. In 1964, Marshall McLuhan aired his famous comments on the importance of the medium of communication, even above its content. More recently, in an article titled "How Computers Change the Way We Think," Turkle (2004) quite explicitly claimed, "the tools we use to think change the ways in which we think" (B26).[1] Power Point "carries its own way of thinking, its own aesthetic," she wrote, and "in that

aesthetic, presentation becomes its own powerful idea" (B26). The implication is that the use of presentation software in the corporate boardroom is indicative of a wider "culture of presentation" where "appearance is often more important than reality" (B27). Turkle argues in this example that presentation software has "fetishized the outline at the expense of the content" (B27). There is much truth to this argument. Turkle's reading of Tufte (2003), who condemns presentation software as "PowerPoint Phluff," (4) informs her views. Tufte criticizes PowerPoint for the paucity of space per slide allocated to original material, the replacement of complex processes with oversimplified and unconnected bullet points, low-resolution image reproduction, restrictive templates, and promotion of intellectual simplicity. "Audience boredom is usually a content failure, not a decoration failure" (24). The answer, according to Tufte, is nothing less than "product recall" (24).

Tufte is not alone in condemning Power Point. In July 2003, two months before Tufte published his book, Oliver Robinson reported in the Sydney Morning Herald that modern presentation technology was killing our power to communicate. Graham Jones, speechwriter and journalist, called it "Death by PowerPoint" (Robinson 1). "The difficult thing," said speechwriter Brian Jenner "is if you're giving PowerPoint presentations, you're not using yourself to communicate, it's more about giving people information which doesn't inject any passion into the message" (Robinson 1). According to Robinson, business leaders are turning away from PowerPoint and rediscovering the impact of old-fashioned speechmaking. Robinson invited his audience to "forget the high-tech gadgets when you're making a presentation. Just be yourself" (1). Those who write about PowerPoint use in education do not go that far, but they do warn that PowerPoint must "support effective teaching" (Walsh and Frontczak 2003, 41).

Frey and Birnbaum (2002) acknowledged that "PowerPoint is often the first step" for tertiary teachers wanting to introduce ICT into the university lecture (7). Frey and Birnbaum surveyed 160 students about their response to PowerPoint and what value they gave its use as an instructional tool. Although the results

were overwhelmingly positive, Frey and Birnbaum concluded that "continued research is needed on successful strategies for using presentation software to achieve course goals" given their belief that the literature in the instructional use of PowerPoint was "limited" (8, 3).

It is clear from the literature on PowerPoint use in education that we still know very little about how best to use it, how to overcome any inbuilt shortcomings, and how it might presuppose learning directions. In particular, what elements of the PowerPoint presentation either contribute to or discourage the maintenance of student interest? How can teachers capitalize on student response to improve learning outcomes? How can PowerPoint be used effectively to support a more constructivist pedagogy? Or does instructional technology by its very nature, that is, the limitations of its "medium," produce a learning environment so overwhelming that, as Apple (1991) suggests, "[t]he discourse of the classroom will center on technique, and less on substance" (75).

The constructivist learning model's aim is to encourage students not just to remember information but to engage it, work with it, take ownership of it, and understand it by adding to known knowledge and building on new knowledge by exploring possibilities. The key descriptor, says Perkins (1992), is "'active'—not just responding to stimuli, as in the behaviorist rubric, but engaging, grappling, and seeking to make sense of things" (49). This approach seems to offer no place for presentation software that according to Tufte is "presenter-oriented, and not content-oriented, not audience-oriented" (4). Following this position, PowerPoint is connected with displaying authority and therefore allied to the direct learning model: "[t]he fans of PowerPoint are presenters, rarely audience members"(4). Presentation software, however, can add an extra dimension to the lecture that can allow the lecturer to turn a traditionally conservative practice into a bridge between direct- and constructivist-learning models. This is where the teacher's role becomes crucial.

Tufte's examples of ineffective Power Point presentations all relate to inappropriate, restrictive, repetitive, and unimaginative uses of the software, such as relying on fixed templates, limiting the type

of material presented on slides, and compromising the content to fit presentation patterns. For example, when Tufte criticizes the "line-by-line slow reveal," it is because the presenter "unveils and reads aloud the single line on the slide, then reveals the next line, reads that aloud, on and on, as stupefied audience members impatiently await the end of the talk" (23). My aim in examining PowerPoint use was to identify those areas that made PowerPoint an effective teaching tool and then ascertain how best to capitalize on those features to produce more effective student participation in lectures.

Methodology

To explore whether PowerPoint could be used effectively in lectures, that is, whether form could enrich rather than stifle content, I surveyed forty-six history students in the second or third years of their university degree across several separate classes taught by different staff members using a variety of styles and levels of PowerPoint competence. The survey was anonymous and administered by a neutral third party. The questionnaire was used to elicit qualitative information about the positive and negative aspects of PowerPoint use in lectures and, in particular, to identify those elements that could help to maintain student interest. All students had been exposed to some use of PowerPoint in lectures: 39.13 percent of respondents said they saw a PowerPoint presentation occasionally, 36.96 percent most of the time, and 21.74 percent almost every lecture. Students responded favorably to PowerPoint presentations: 76.09 percent thought PowerPoint was an excellent method of presentation, and 89.13 percent of students reported that they believed PowerPoint aided their learning.

It is impossible within the scope of this study to analyze in detail what the students understood by "learning." However, their comments about the perceived benefits of PowerPoint in their learning environment provide some insight into what areas of the learning experience they saw as important. These comments included the way hearing the lecture and seeing projected information at the same time served to reinforce new material; the identification of key points made access to new information easier; information could

be presented in a way that was easier to understand; displaying information assisted note taking; the visual presentation of material, especially if accompanied by a printout, allowed time just for listening; and the presentation of a visual image with a verbal description made understanding easier. Some comments also suggested students were able to understand the lecture better because of the increased clarity of the presentation facilitated by PowerPoint and because they could think about the whole lecture without scrambling to write down basic information. Students believed printed handouts increased their retention of information and ideas presented in the lecture over time. In this context students included in their ideas of learning, knowing, remembering, understanding, and thinking about new material in their ideas of learning.

Both Gilroy (1998) and Frey and Birnbaum (2002) believed the use of ICT in tertiary education increased student interest. Sixty-nine percent of Frey and Birnbaum's surveyed students strongly agreed or agreed that PowerPoint held their attention (5). My survey results confirmed Frey and Birnbaum's study where students commented that they found Power Point helped in note taking, aided study revision, and helped keep their attention. Of the students in my survey, 95.65 percent answered "yes" to the question "Is your attention maintained throughout the PowerPoint presentation?" I was most interested in why students believed lectures with PowerPoint held their interest, because I wanted to use that data to explore ways to encourage greater intellectual participation in lectures, create more dynamic lectures, and increase the active-learning component of the lecture. PowerPoint should not be used to attract attention superficially so much as to maintain interest for the purpose of encouraging genuine ongoing engagement with the lecture's material.

Discussion of the Survey Results

The survey questions were designed to achieve some quantifiable data (yes/no answers), but primarily my purpose was to encourage students to write about PowerPoint in their own words (see appendix). Most of the questions were open-ended. I wanted to discover whether PowerPoint

presentations, perhaps because of their increasing use and the operators' limited skill base, were boring. Most important, I wanted to elicit a response to the use of PowerPoint that was not necessarily directed by predetermined suggestions; that is, I tried to limit the questionnaire structure to see what concepts the students worked with when asked to think about the PowerPoint presentations they had seen. In this sense, I wanted to see the conceptual level the students applied to the analysis of their own learning using PowerPoint as a starting point. I also wanted to elicit ideas about those features of a lecture that held a student's attention without directly asking. The data that interested me most were not necessarily statistically significant but qualitatively significant. When students had an opportunity to give their opinion about the use of PowerPoint in lectures, what sorts of responses did they have and what did they say about the maintenance of interest?

Much of the student comment presented in the questionnaire about interest levels and maintenance came from an appreciation of visual stimuli. PowerPoint presentations they saw not only projected the written word as difficult texts, foreign words, complex spellings, summaries, or main points, but projections, invariably included diagrams, graphs, portraits, maps, landscapes, and examples of architecture and art. Something to look at other than the lecturer helped focus attention. Listening alone was considered more boring than watching and listening together. Students enjoyed seeing pictures. Some students explicitly identified the active aspects of the visual stimuli as significant, but they did not differentiate between the animation within each slide and the progression of slides and simply referred to the presence of "movement." "Often there are pictures/diagrams and the movement gets your attention," reported one student.[2] Interest was linked to anticipation: "You have to remain attentive, waiting for the next slide"; "the movement of the slides keeps me going." Here the PowerPoint presentation compares favorably with the old-fashioned overhead projections. Even when prepared clearly in color, overhead transparencies are one-dimensional. The integration of more than one image is difficult, the combination of image and

text is clumsy and the renovation of the overhead impossible. Design was also an important element related to interest: "colors and graphic design always attracts my attention"; "it keeps me more interested with the colors and the movements"; "there are also colors that make the lecture more alive rather than plain black and white overhead slide projections." The key factor was, as one student said, "pretty lights." Twenty-six of the forty-six respondents specifically offered the variety of movement and color as rea-

PowerPoint maintained student interest when the slides varied in style, format, purpose, and frequency.

When asked specifically, "Have you ever felt bored with watching yet another PowerPoint in lectures?" only 10.87 percent of surveyed students answered "yes" and 86.96 percent answered "no." Those who had not felt bored justified their answer in terms of a positive response to variety: "There is always something new to read about and study"; "They are always different—never the

by interesting Lecturers"; "Attention is maintained most of the time if accompanied by an interesting, good lecturer"; "Interesting lectures also help"; "different teachers used them differently, so some are effective and others are not." Teachers must make effective use of the projected material, not "flick" through the slides or laboriously read what is on the screen while standing with their back to the class. The teacher must be able to judge the presentation's pace so as not to move too fast or too slowly through the slides. Sometimes slides are useless in their brevity or burdensome in their detail. The survey indicated very clearly that the level of student interest in a PowerPoint lecture was dependent on presentation management. Clearly, students did not see PowerPoint in isolation but rather as part of a pedagogical package, including the interest the topic held for them, the personality and delivery style of the lecturer, and even whether the lecture was delivered at the end of the day. The teacher's role is seen as crucial. There is an integrated relationship between the lecturer, the content, and the slides. The students recognized the importance of this link, as did Turkle. "Of course in the hands of a master teacher, a PowerPoint presentation with few words and powerful images can serve as the jumping-off point for a brilliant lecture" (B27).

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sons for the maintenance of their interest in PowerPoint slides.

The effectiveness of design was also commonly linked to the perceived skill of the lecturer in developing a PowerPoint presentation. "Lecturers must use PowerPoint with some design flair and skill. Those without these could do with some training or help with design," said one student. The experience of surveyed students pointed to the quality of PowerPoint as an important factor in maintaining interest. It was not PowerPoint itself that was interesting but how it was prepared and what features of the software were employed. For example, one student wrote: "When well created, i.e., use a great mix of graphics and text to really draw the viewer in they hold an audience." One student explained that PowerPoint lessons were effective "only when they are well presented; the creator's skill must be at a competent level." Color, animation, variations in design, and slide progression elicited a positive response to PowerPoint. On the other hand, the absence of these features was linked to poor preparation, lack of skill, and consequent ineffectiveness: "when ill prepared, they are boring and repetitive."

same." Variety extended past the presentation to the frequency of presentation style: "I don't always get them, so I don't have one class with PowerPoint after another." Boredom "depends on whether they are used all the time." PowerPoint "should be used not sparingly but at the same time not used continuously." Students wanted to see PowerPoint presentations because they understood their benefits, but at the same time a very small number, perhaps paradoxically, acknowledged a potential for boredom. This boredom did not just relate to repetitive style or format, but one student acknowledged that using PowerPoint too frequently caused boredom.

These survey responses superficially suggest that form, rather than content, impressed students. They equated variety, color, and movement with good teaching. But at the same time, they believed these features helped keep their attention and maintain their interest in the lecture; that is, the form was directly related to their increased ability to focus on the content. This is where the student responses take issue with Tufte.

Students did not fail to link the lecturer with the success of PowerPoint. A good PowerPoint experience "is presented

Implications

Educationalists are just discovering the pedagogical potential of presentation software, but it is useful to think about the extent to which PowerPoint can be used to facilitate variety in the lecture to maintain and encourage student interest. Although my survey indicates an overwhelmingly positive response to PowerPoint, the collected comments show a preoccupation with difference, movement, change, and variety as the reason why interest is maintained and attention held. One response even admitted that PowerPoint presentations were "usually . . . made to be entertaining." PowerPoint is appreciated because it facilitates variety. Student perception of interest depended so heavily on the colors, design, and even the number of slides shown, although, most important, PowerPoint was deemed effective only when it was used by competent and inter-

esting lecturers. Lecturers need to limit the use of the repetitive bullet-point style and instead incorporate diagrams, graphs, images, and sound bites when appropriate. PowerPoint offers a host of opportunities to present slides in a variety of ways, and it is important that variety be exploited if interest in the lecture is to be maintained.

PowerPoint, however, is only a delivery system for presenting information to students. It is important that the variety students identified as being so integral in maintaining their attention is pedagogically directed. Attractively presented slides are useless unless their intellectual content is challenging and important. Form without substance will not engage a class, but variety in form may help make new material more accessible, memorable, and easier to understand. Although the technology is inbuilt with variety, the greatest variable rests with the teacher, who can use the technology in pedagogically exciting ways, even in a lecture. It is fashionable to criticize the direct-learning model, best exemplified by the lecture format, as "irrelevan[t] to the needs of today's students" (Roblyer 2003, 59–60). Roblyer believes that students are left unmotivated, cannot use skills in unfamiliar situations, are unable to solve problems, and have trouble in cooperative situations. Students need to be stimulated to respond to presented material imaginatively, analytically, and aesthetically so they can think critically, question, and explore. The major way to encourage student interest in lectures is to seek their participation. "Proficient technology-oriented teachers must learn to combine directed instruction and constructivist approaches" (56).

With ICT, the lecturer can encourage a greater degree of constructivist learning within the lecture format. The easiest way to do this is by posing questions and problems, offering visual imagery to stimulate a creative response to issues, and teaching across Gardner's multiple intelligences (Gardner and Hatch 1990). Written text can be projected to allow for extended analysis, which provides more opportunities for students to understand concepts and ideas. It is also possible to project an image to use as the basis for a mini-discussion, or to screen multiple images for comparison. PowerPoint can be used to create an emotional response in stu-

dents by combining image, sound, and text. The visual or musical learner can particularly relate to the presentation of material in this way. PowerPoint becomes an essential ingredient in encouraging students to engage lecture material. PowerPoint is best used as a tool to reach learning objectives, not as a means to reinforce the direct-learning model's worst features. PowerPoint need not be the authoritarian weapon of Tufte's scenario.

The lecturer is ultimately responsible for encouraging interest by remaining student focused, rather than presenter focused, and by enhancing his or her ICT use and design knowledge. Each slide carries content of the lecturer's choosing. It does not have to be trivial, and it does not have to be the only material presented to the students. Lecturers can encourage students to make their own connections and construct their own understanding of the visual and the aural stimuli. Lecturers must also be aware of their own pace, movement, injection of drama, systematic organization of material, and voice production as well as the use of hall lighting. The lecturer must reintroduce spontaneity into the lecture and be confident enough in the structural preparation of the PowerPoint presentation to break away from it and still know how to find his or her way back. It may be useful in some classes to abandon PowerPoint altogether and to approach the material in a completely different way, to do something where note taking is not required or where learning can be drawn from the students' experiences. In this way, PowerPoint's benefits can be optimized without losing them to familiarity and expectation. There is a nagging suspicion arising from this research that the software that promises to maintain interest because of its encouragement of variety will ultimately lose its novelty. The design features will not be new and different anymore. The flying text and the sound effects will become boring. When variety is the key to maintaining interest, students may eventually tire of the kind of variety PowerPoint can offer. The survey respondents identified novel stimuli as important to maintaining interest. This is why students enjoy PowerPoint lectures and why lecturers must be more aware of the importance of management of variation. To this end, lecturers must con-

sider PowerPoint's more advanced and innovative features.

It is clear from the survey that students favored higher levels of design skill in their classes and a more imaginative use of PowerPoint software. Students' preference for color and movement showed they were looking for a presentation that held their interest. PowerPoint is an effective delivery system for information, but neither fixed templates nor repetitive and unimaginative use of the bullet point, which should be used to support, rather than direct, the lecture, should restrict the lecturer. Presenting summarized information is PowerPoint's most limiting feature. Yet, it is the one most commonly used and for which the software is most noted. Surveyed students referred to taking notes from PowerPoint slides as both beneficial and difficult. Students took notes and listened, but they could become lost if the teacher wandered away from the notes and the projected screen was seen in isolation. Students responded best to printed PowerPoint slides they could keep that reduced the impulsive desire to copy the notes from the screen. If printed slides are distributed, then the lecturer is in a better position to develop the constructivist techniques that move the lecture away from direct learning. With copying eliminated, students can be asked to comment on the notes, engage in discussion, and move out from the information given to explore deeper implications. Students can refer to notes in their hand and compare that information with material projected onto a new screen. If desired, that information can be overlaid with sound bites or an explanation from the lecturer. Ultimately, and fundamentally, with note copying eliminated, students can be asked to think about what they hear and see in lectures and to make their own, personal notes; they can be confident that they already have the information the lecturer wants them to have. This development is essential to the encouragement of higher-order thinking. Students should be encouraged not to copy, but to express; this conceptual shift should be possible within the lecture format with the use of PowerPoint.

We need to free ourselves from fixed formats and tried purposes and consider instead how to use PowerPoint more innovatively. This may involve exploring and

integrating its diverse capabilities. Power-Point can, for example, be used to project all kinds of material, prepared and selected especially to illustrate the lecture or to stimulate discussion. This material can be summaries or notes, but also more complex text, images, film clips, and sound bites. What we choose to project should require deeper engagement by students and more higher-order thinking.

Internet access is another more complex feature of PowerPoint that presents enormous opportunities to bring immediacy and interactivity into the lecture hall. It is possible to use PowerPoint to hyperlink to the Internet and access digitalized archival documents, interactive Web sites, the course's home page, up-to-the-minute information such as news reports, or purpose-built Web sites. When used in this way PowerPoint is much more than presentation software used only to display information; rather, it becomes a gateway through which a much wider range of resources can be accessed and a wider range of activities can be employed to encourage student learning. Whatever is available on the Internet becomes accessible in the lecture hall and can be integrated, as appropriate to the discipline, into the lecture.

PowerPoint can also work in conjunction with compatible technology to encourage higher-order thinking and more extensive student involvement in the lecture hall. Using a Sympodium, it is now possible to project material onto a Smartboard (an interactive white board) and then edit or annotate directly onto the screen. This feature would be particularly advantageous, say, in the discussion of a complex text, a set of figures, or a significant image. The slide would be projected onto the Smartboard and then the lecturer could directly annotate the projected text. Students could participate in this process and the annotations could be edited and re-edited until the screen expressed the direction of the discussion or met a particular learning outcome. The new edited screen could then be saved, printed, e-mailed, or published to a Web page for later reference or act as the basis for a student exercise.

Conclusion

Students appreciated PowerPoint only while it held their interest, which occurred when there was variety in the design of the presentations using color, movement, and frequency. That variety was a function of the lecturer's expertise in creating and employing the presentation in the class. My survey's evidence suggests students recognized the benefits of a PowerPoint presentation but were critical enough to equate the success of the class with the lecturer's ability to use PowerPoint as a tool in meeting teaching and learning objectives, rather than as the driving force of the lecture. If we believe that technology determines the educational environment completely and rigidly, then we underestimate the importance of the teacher's role in delivering effective pedagogy and the teacher's ability to engage the students by focusing on their learning as an active exercise—that is, by developing a more constructivist environment. PowerPoint can assist in meeting those goals when we use it to grasp and maintain student interest.

NOTES

1. My thanks to Carol B. MacKnight for directing me to this reference.

2. All student comments are taken from the open-ended questions in the anonymous student survey.

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APPENDIX
PowerPoint Questionnaire

1. Over what period have you experienced the use of PowerPoint presentations during lectures at UNE?
2. How often do you see a PowerPoint presentation in history lectures?
3. What is your opinion about PowerPoint as a method of presentation in lectures?
4. What do you like best about PowerPoint presentations?
5. What do you like least about PowerPoint presentations?
6. Do you believe the PowerPoint presentation aids your learning?
7. Is your attention maintained throughout the PowerPoint presentation? Why or why not?
8. Have you received printouts of the PowerPoint slides as notes? If yes, do you take other notes as well or do you rely only on the printouts for your lecture notes?
9. Has your opinion about PowerPoint as a method of presentation changed over time? If yes, why?
10. Have you ever felt bored with watching PowerPoint in lectures? Why or why not?
11. Any other comments?