

The iTest Process for determining guidelines for teaching spaces

Abstract

This document covers the process used by the iTest project to make recommendations regarding the minimum size of text used in presentation materials in various teaching rooms at Royal Holloway. A major goal of the project was to make the process extremely repeatable and very easy to confirm for both students and members of staff.

In a nutshell, for each teaching space in the College, we take a photograph of the teaching display from the student seat that is furthest from the presentation area. We measure how much space the teaching area takes up on the photograph and compare that picture with another photograph that shows the eyesight test required by the UK driving license. This comparison allows us to calculate the minimum sized font that a student in that seat would be able to read. We go into some more detail on this process in the following section.

Overview

It is self evident that Lecturers and other teaching staff should not teach from slides that use text that is too small. A problem arises when one asks the question ‘How small is too small?’ – particularly because the answer depends so much on both the conditions of the room and the eyesight of the student.

To deal with the first of these problems is easy – we simply measure each room independently. To deal with the second requires a certain amount of assumption about the eyesight of the student. After looking into a variety of possible averages and measures for the (corrected) eyesight of students the project settled on the following assumption:

We can assume that students either have, or have taken corrective measures to achieve, a level of eyesight sufficient to pass the eyesight requirement of the UK driving test; however, we have no right to assume that any student has a better degree of eyesight.

There are two places where this assumption can be challenged – the first is that it excludes from consideration any partially sighted students, or students with disorders that may manifest themselves visually (such as dyslexia) - our position is that students with such special arrangements should be already supported by college procedures – this process is designed to improve the teaching conditions for all students.

The second place to challenge this core assumption is that it rather arbitrarily chooses the UK driving test as its standard. Our position is that we are happy to

consider any other measure and look forward to considering many in our future work; we choose this measurement because it is one that is immediately familiar to most readers, is part of society in such a way that a great many people know if they require correction to achieve this standard and, frankly, it allows more flexibility in the preparation of teaching material than some of the stricter standards.

Method

The UK driving test eyesight test requires that one must be able to read a number plate correctly at a distance of 20m.

Our first step was thus to take a picture of a number plate¹ with the inbuilt camera on an Apple iPhone 4. The choice of camera was not accidental – because we wanted both staff and students to be able to replicate this work we deliberately choose a model of phone, and thus camera, that was very common among students.



The picture above shows the number plate (with the green box around) at the correct distance taken with the chosen camera.

From the original photo (the image above has had its resolution reduced) we find that, in these conditions, the letters on the number plate are 14 pixels high. Thus it appears reasonable to suggest that if one was to take a picture of some other text (such as roads signs on a motorway, train timetables at a station or even text on a PowerPoint slide), then we should be able to count the height of the

¹ The car belonged to a member of the team.

letters in pixels to decide if it is reasonable to expect a person at a particular position to read a particular piece of text.²

Our next step was to visit each teaching space of reasonable size on campus (we examined only rooms that catered to more than 40 students), identify the ‘worst’ seat in the space for viewing slides on the projector screen and take a photo of the project screen in operation.

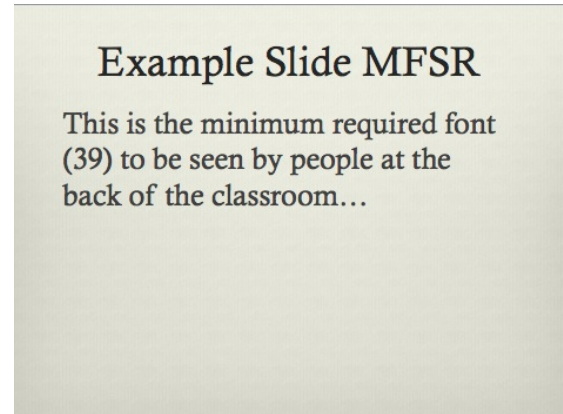
To the right, for example, is the Munro Fox Seminar Room.³ In the original photograph the display area for slides is 315 pixels high (measured to the nearest five pixels). Following a simple calculation we can then say that a piece of text that is the **minimum** size that we could expect a student in this seat to read, would take up 4.4% of the slide.



For the next part of this process, we must work out how this would convert to a font in PowerPoint. To do so we make an example PowerPoint slide with some text of font size 32. By carefully measuring the size of the text against the size of the slide (again in pixels) we find that those letters take up 3.62% of the slide.⁴

We know that font sizes scale linearly – font 64 is exactly twice as high as 32 and so on. So we can use the ratio of the two percentages to say that a minimum font size (accepting all the assumptions we have made) for this room would be 39 – there is an example slide to the left.

By following this approach for every teaching space that we examine, we were able to produce a document (which forms part of this pack) that gives a minimum recommended font size for PowerPoint slides for a range of teaching spaces on campus.



² For the purposes of this project we are ignoring issues like typeface and colour

³ For this photo, the room happened to be laid out for examinations; however the location of the normal ‘back row’ was found by examining marks on the floor

⁴ We assuming default slide dimensions and that our lecturers have not changed the size of slide for printing. We are also assuming default typeface used – people using different typefaces should take this into account.