Video Animation for Learning

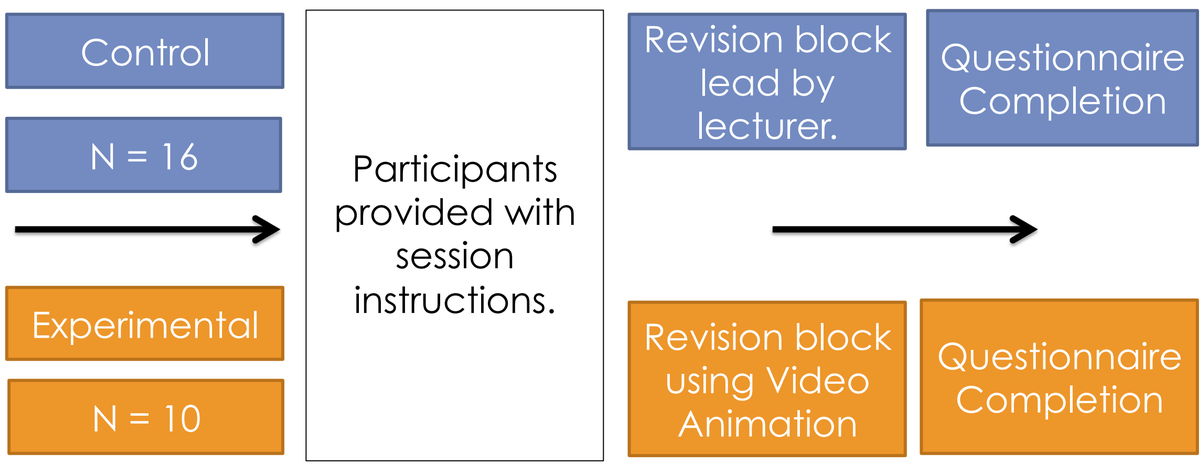
1. Introduction

- Recent research has encouraged that student learning can be developed through visual presentation form (Mayer, 1999).
- Whilst, the integration of knowledge can be a challenging and a somewhat concerning endeavor. There has been a shift from static pictures to dynamic visualisations used for learning.
- Video animation is essentially a simulated motion picture and has three separate purposes: 1. Support visualisation of mental processes, 2.Producing a cognitive conflict and 3. Enabling learners to explore a phenomena (Bertrancourt, 2005).
- Benefits of animated content over static content has been disputed (Bertrancourt, 2005). Some researchers have proposed little benefit for the use of animations over still pictures (Tversky, Morrison, & Bertrancourt, 2002), notably when non relevant material is integrated within animations.
- On the contrary, the cognitive load theory (Chandler and Sweller,1991) suggest learners are better able to mentally visualize a process, resulting in a reduction in a cognitive load (Hoffler and Leutner, 2007)
- A meta Analysis conducted by Hoffler and Leutner (2007) rreported that animation was significantly superior in the transfer of knowledge in comparison to static pictures, especially when referring to a specific topic.

Aim:
This study aimed to compare how able university students could focus, engage and understand with the topic specific content between animation and static picture conditions during an exam revision session.

Hypothesis:
Students would be able to better focus, engage and understand the content in the animation conditions compared to the the static picture condition

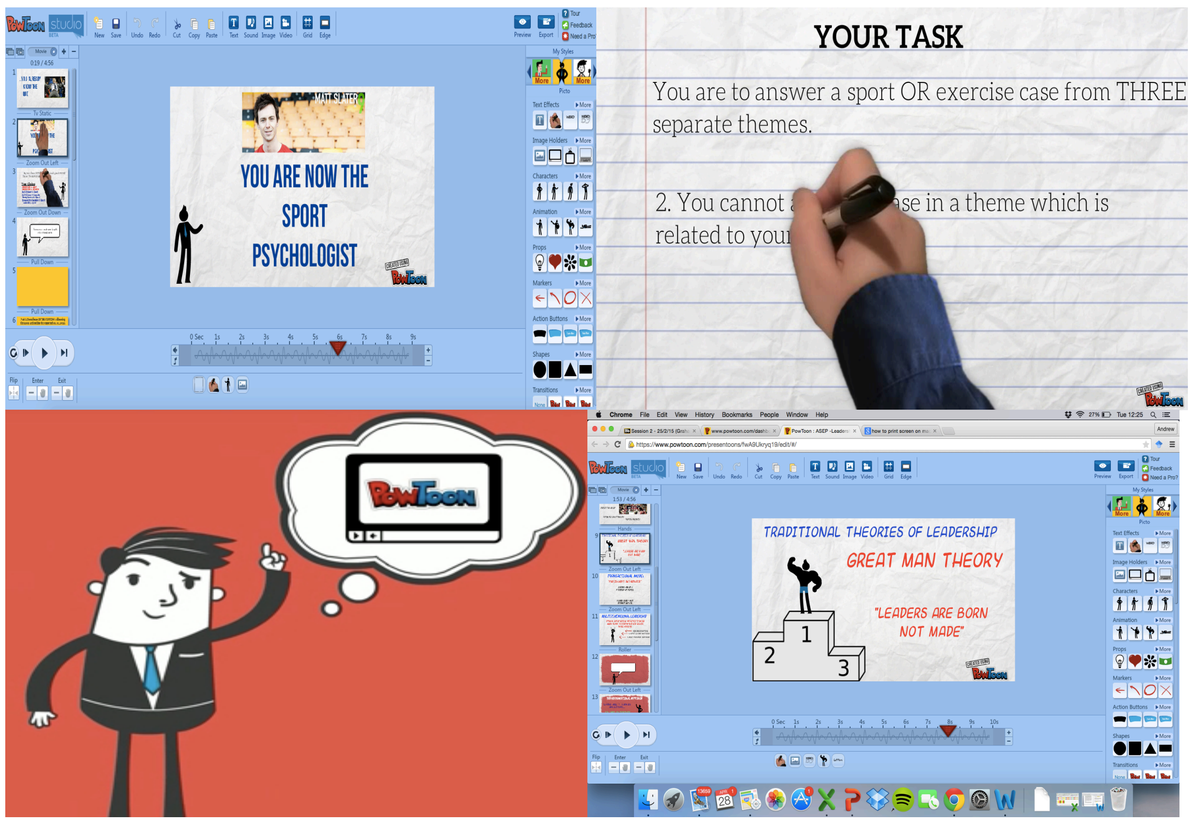
2. Method



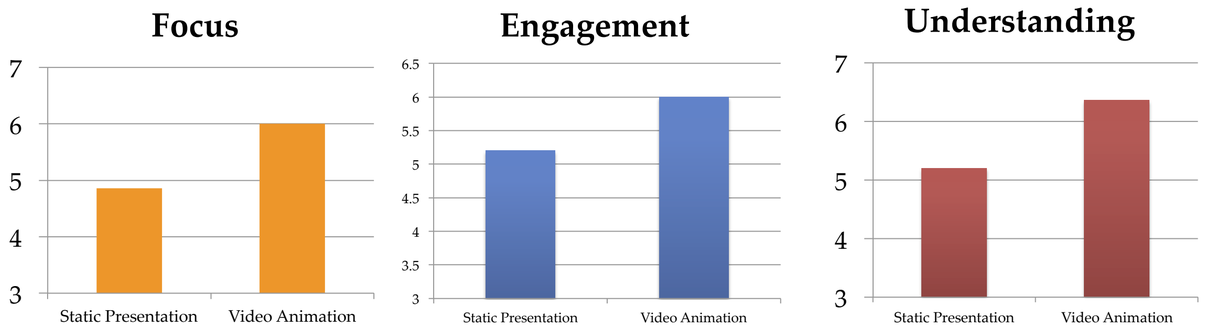
Measure:
1. Focus
2. Understanding
3. Engagement

Data Analysis
1. Data was Cleaned and Screened.
2. Tested for Parametric Assumptions.
3. A MANOVA and t-test was conducted.

Video Animation Tool: 'PowToons'



3. Results



A multivariate analysis of variance **reported a significant difference** between the participant's ability to focus, understand and engage between the static and animation video condition. (Pillai's Trace = .474, $F(1,24) = 4.734$, $p = .007$, $\eta^2 = .474$).

An independent samples t-test **reported significant differences** between control and video animation condition for the participants:

1. **Focus** ($t(26) = -2.56$, $p < .05$).
2. **Understanding** ($t(26) = -3.60$, $p < .001$).
3. **Engagement** ($t(26) = -2.09$, $p < .05$).

4. Discussion

Students reported that they were better able to focus, understand and engage with the material provided.

- In line with the theory of cognitive load, the animation helped the students to mentally visualise the content within their working memory, therefore reducing the cognitive load and freeing up its ability for retention.
- On the contrary, for static pictures the use of abstract cues are required to be interpreted and integrated within the working memory, thus imposing more an increase in cognitive load on the learners (Chanlder and Sweller, 1991).
- Two characteristics appear to be essential when harnessing video animations, these are: the accuracy of content to the given topic and second to assess the capabilities to interact with the material.
- Animated presentation compared to static presentation facilitated learning specifically under conditions where a topic is to be learned.
- Content itself was very relevant to the up and coming exam therefore the learners engaged in the animation.

Limitations

- Did not objectively measure retention of information (i.e., exam scores).
- The duration of revision blocks for animation or static presentation was no standardized.
- The topic was not relevant to a handful of students who were unable take the topic through to their final exam.

Implications for teaching

- Important for teachers to become competent in creating animated videos, meeting the learners requirements.
- Focus must be placed on creativity, in effectively integrating the content with animations and audio files.
- Consider the use of animation as a supplementary tool for education.
- Consider the length and pace of the content in relation to the topic.
- Understand and assess appropriate time to implement animation videos.

References

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