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The Impact of Lecture Presentation Medium on Student Learning

Proposal

Statement of the Problem:

The purpose of this study is to examine the difference in student learning when content is presented via video and when it is presented via written text.

Significance of the Problem:

Massively-Open-Online-Courses (MOOCs) are beginning to take the place of formal education for some. A primary issue with MOOCs is that they try to replicate the classroom experience. Educators aren't aware of how to adapt their material from courses previously taught in a classroom to be consumed in a MOOC. Lectures hold a significant importance in both classroom education and MOOCs. What is important to understand is how the medium in which the lecture is presented impacts student learning. For example, educators need to know whether to present students with a video lecture, or a written lecture. If MOOCs are truly going to be a competitive force in replacing the traditional education model, it is important that educators understand what the most effective medium is for presenting content like lectures.

Definitions:

MOOCs: A Massively Open Online Course is a broad term that describes any open enrollment online course that is offered at no cost to a large number of people. Examples of MOOC providers include EdX, Khan Academy, and Coursera.

Online Course: Any academic course, for credit or not, which is taught exclusively online. This can include web conference classes as well as classes that use a Learning Management System to distribute content and assignments.

Video Lecture: This includes any recorded lecture that has synchronous video. This could be a recording of the instructor alone teaching the material, a recording of a white board being drawn on by the instructor, or a recorded lecture of a previously taught class.

Written Lecture/Readings: Any content or instruction that is delivered via text on a paper, or as part of an electronic file. This would include a PDF of book chapters, a journal article (electronic or otherwise), or a web site.

Cohort: A group of participants who were assigned the same form/test to take.

Period of Research: A time to be determined that will indicate when the form can be used by participants and when the form will be closed to new participants.

Hypothesis/Research Questions:

Hypothesis: Video lectures achieve greater student learning (comprehension) than written lectures.

Null Hypothesis: Video lectures do not achieve greater student learning than written lectures.

Research Question 1: Is a video lecture more effective in terms of a student's comprehension of the content than a written lecture?

Methodology - Subjects

The subjects of this study are students who are able to take MOOCs. Therefore, the study is open to anyone over the age of 18 who has Internet access. The target is 100 participants. Participants will be solicited via social media, and other means in order to reach the target.

Methodology - Instrumentation

Data for this study will be collected using four different Google Forms. Each participant will be assigned a form randomly using a web application. The participants are unaware that there are multiple forms available to them. Each Google Form presents the same exact content but in different orders, and using different media. The following describes the order and medium of content in each test:

Test 1a: Text of Lecture 1, Video of Lecture 2

Test 1b: Text of Lecture 2, Video of Lecture 1

Test 2a: Video of Lecture 1, Text of Lecture 2

Test 2b: Video of Lecture 2, Text of Lecture 1

This format will allow the study to eliminate any discrepancy between the ability to comprehend different content by presenting the same content in two different forms.

Methodology - Procedures

The period of research will open with an invitation to eligible participants to visit the web application and click the link. Once the participant clicks the link, he/she is automatically assigned to a form, and thus a cohort. Once assigned a cohort, the participant follows the form until completion. Below is a chart that describes the sequence in which each cohort will experience the form:

Cohort	Test	Step 1	Step 2	Step 3	Step 4
1a	Test 1a	Text of Lecture 1	Comprehension Questions	Video of Lecture 2	Comprehension Questions
1b	Test 1b	Text of Lecture 2	Comprehension Questions	Text of Lecture 1	Comprehension Questions

2a	Test 2a	Video of Lecture 1	Comprehension Questions	Video of Lecture 2	Comprehension Questions
2b	Test 2b	Video of Lecture 2	Comprehension Questions	Text of Lecture 1	Comprehension Questions

Lecture 1 and 2 are different lectures, but the text of each is a direct transcript of the words spoken in the video. There is no change to the content from video to text. There is also no difference in the comprehension questions for the video and text versions of each set of content. (For example, Lecture 1 has the same comprehension questions for both the video and the text)

The order in which a participant experiences each piece of content/medium is scrambled via the random form assignment to eliminate any confusion that the order of the content may be causing any discrepancy in score.

At the completion of the period of research, access to the form will be removed, and data analysis will begin.

Methodology - Data Analysis

The first method of analyzing the data is to examine whether participants did better on the comprehension questions for the video they watched, or the text they read. This analysis will be conducted for each participant. Following the individual analysis, its results will be combined to indicate whether there was a significant difference in scores on the video content comprehension questions compared to the written content comprehension questions.

After determining whether there was a difference in performance for individuals on different content, analysis will be conducted for participants who experienced the same content. Given the set up of the tests, all participants experienced Lecture 1, but half of them experienced it as text, and the other have experienced it as video. Regardless of what cohort they were a part of, the scores for participants who experienced Lecture 1 as video will then be compared with the participants who experienced Lecture 1 as text. This will be done by finding the average score of participants on Lecture 1 as video, and Lecture 1 as text. This analysis will indicate whether there is a significant difference in comprehension of the content when experienced via video or text. The same procedure will then be followed for Lecture 2.