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Digital moviemaking in student degree theses

To train science communication skills, students had to present their results as movies instead of written degree theses. Student motivation, self-initiative and efforts were much higher than in classical project formats.

Introduction

We are confronted by multimedia every day. Since around 1997, the time we spend on electronic media surpasses the amount of time we spend in face to face interactions. With today's flood of information, gaining the consumer's attention and conveying information has become ever more challenging and competitive. In this respect, movies and images perform much better than written words: Texts are processed by our working memory, which can hold only seven objects at a time; visual information, in contrast, goes directly into our long-term memory and can be memorized in much larger quantities. Current university students not only consume multimedia content, they increasingly appear as producers, mostly on social media platforms. So it is not surprising that young people are nowadays called 'digital natives'. However, despite their inherent aptitude with new media formats, university students rarely have the opportunity to apply their experience in a more academic setting. They are most often asked to hand in research papers, which thereafter end up in the supervisor's drawer without having any further impact. This stands in stark contrast with efforts such as ETH's Critical Thinking initiative, which amongst others, aims at fostering student competence in sharing knowledge with peers and society. In the autumn semester of 2017, ETH historian Bernhard Schär and the author introduced a multimedia component to their course "Historical Collections in Context: Putting Butterflies, Stones, and Orchids on Film". ETH Zurich holds scientifically outstanding zoological, botanical and geological collections with millions of specimens as well as accompanying letters, field books, photos and drawings from the past centuries. This cultural and scientific heritage provides a rich resource for student research. The multimedia component of the seminar was for students to carry out their own research projects on a topic in the history of science and to create a movie to present their findings.

Teaching approach

The learning objectives for the multimedia component were threefold. First, students would learn to perform independent scientific analyses in a relevant area. Second, students would develop skills in the use of current multimedia technologies. And last and most importantly, students would learn how to break down complex subjects into understandable stories and present them in a concise and entertaining short film no longer than 2-3 minutes. The course lasted for fourteen weeks with two lessons in class per week and accounted for three ECTS credits. Over the fourteen weeks, students were introduced into the different fields of the course:

- the ETH Multimedia Services team gave training on the technical aspects of movie making
- in order to familiarize themselves with the subject matter of the course and to identify research questions for the following movie projects, the students visited

the Zurich Herbaria, ETH's Earth Science Collections and ETH's Entomological Collection
- in class, the students discussed history of science papers, thereby learning how to analyze questions in the history of science
- outside class, students read history of science articles on their own and composed short papers on a biweekly basis.

In the last four weeks of the semester, the students worked on their own movie projects in groups of two. Two months later at the end of the semester break, the movies were handed in. In a small closing ceremony followed by an apero, the films were screened and jointly discussed.

Results

Initially eleven students enrolled for the class, seven started and six finished by completing the movie project. As subjects, the students chose the history of the ETH Entomological Collection, the expedition to Iran by the Swiss geologist Arnold Heim, and the botanical field trip to Angola by the Swiss couple Hans Ernst Hess and Esther Hess-Wyss. In addition to the movies, students submitted documents with associated metadata such as primary and secondary references or software products and multimedia data used. From a technical viewpoint, all movies were excellently produced. Students were offered Adobe Premiere by ETH, but most of them used additional software products such as iMovie, Pro Tools or Garageband on their own. For the shooting of the films, most heavily used were visualizers, which allowed to record sequences of photos or other documents, to add post-it notes, write titles or draw sketches. Furthermore, indoor footage was taken in collection facilities with professional cameras and smartphones. Students put their materials on screen in very creative ways. For example, cameras zoomed in on images; photos flowed into each other; and a hand leafed through a field book or drew a sketch. Nice effects were produced as well from animated PowerPoint slides. Whereas voice-over narrations were added to all three movies, a soundtrack was used only in two of the films. In general, students acted very independently and required little supervision from the lecturers. Each of the movies was highly enjoyable to watch and very understandable. The students did not limit themselves to presenting lists of facts, but nicely crafted their findings into multimedia stories, which involved the audience with humorous details and moving moments. Although some of the films exceeded the prescribed duration (they lasted 2'30", 7'30" and 8'07" respectively), none of them was verbose or tedious. The shortest one was fast cut and presented its statements in a trendy style but was rather superficial in terms of historical statements. The longer ones excelled in substantive analyses and relevance while still being entertaining. One of the failings was that students occasionally overlooked copyright regulations, which then had to be sorted out in a tedious process at the end of the seminar.

Discussion

Producing movies as student degree theses proved to work excellently in a university teaching environment. The analyses were in most cases thorough, the films were cleverly crafted and the findings were presented in an entertaining and concise way. In comparison with classical written theses, students exhibited markedly greater motivation in a multimedia setting and invested more time on their projects. This may be partly explained by the media itself which allows for more creativity and engages multiple senses whereas written texts - especially academic papers - may be seen as more formalized and dry. In addition, written theses are hardly ever read or discussed

in public, in stark contrast with films. Public performances of the students' movies were highly anticipated and they were shown on several occasions. First, they were presented to the whole class and the curators in a final ceremony. Afterwards, the films were shown on stage at the event "Cultural Heritage at ETH Zurich", followed by a panel discussion with the students, curators and media professionals1. Some of the movies were discussed in a blogpost 2, and some will be displayed in an infinite loop on large screens in several university buildings. And last but not least, some of them have been uploaded to YouTube and are thus visible to the whole world 3 4. By showing their work to a larger audience (including their peers!), students realize that their efforts matter and are appreciated. Keeping this in mind, universities may want to consider creating appropriate multimedia platforms for student multimedia contributions if they ever plan to establish movie making in classes. There are some caveats to movie projects, which require a mention too. Whereas searching for specific information in texts is relatively easy both for human readers and even more so for computers, targeted information retrieval proves incomparably more difficult in movies – both for human viewers (endless scrolling) and more so for computers, which cannot understand speech nor interpret the footage correctly. For supervisors of student projects, written documents are therefore better suited as information repositories than films. Another issue might be the shallower depth of substantive analysis in movie projects. As students spend most of their time on the technical aspects of creating films, the analysis of the subject matter itself may lag behind. In the current course, this effect was attenuated since students invested much more effort on their movies projects in comparison with students from previous courses with written term papers.

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