K-009

Engaging Students in Online Virtual Classroom using Web Application Sutori

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1. Introduction

In response to the ongoing Covid-19 pandemic, many educational institutions have moved classes online. One big problem of online learning is the one-way communication that involves little or no interaction. Injecting ad-hoc small-group discussions may increase classroom interaction but sustaining students' engagement in an online learning setting requires the holistic redesign of learning. In this paper, we share our experience of using a web application named Sutori to boost students' engagement in an online app development course. We briefly discuss the challenges of using Sutori for online interactive learning to benefit other educators of similar needs.

2. Methodology

We have been using Sutori (https://www.sutori.com) as a platform for presenting learning materials and for organizing learning activities. Sutori is a cloud-based collaborative instructional and presentation tool for classroom. Previous study has demonstrated the benefits of leveraging cloud-based technologies for teaching app development [1]. Sutori allows teachers to attach many different forms of learning materials (e.g. pictures, text, videos, links) on the same page and arrange them following a timeline. We used it to structure the learning materials and classroom activities of an Android app development course for university freshmen. App development is a challenge subject to teach because it involves many loosely connected technical details [2, 3]. Giving lectures in an online setting imposes further challenges in terms of student engagement. In what follows we describe the features of Sutori and how we use these features in our course.

2.1 Features

We leverage a full set of features provided by Sutori Unlimited account, including uploading media in various format (videos, PDF, pictures), embedding external resources from Google Drive or websites, adding quizzes, and story analytics.

Learning activities are organized in the blocks; one block can only contain either one video, or one audio, or one image, or one file, and can be accompanied by text descriptions. Both students and teachers can make comments to the blocks, thus facilitating discussions. It is possible to grant students the right to edit the blocks to engage them in the co-creation of learning materials. Sutori support the creation of two types of quizzes: matching quizzes and multiple-choice quizzes. The created stories can be readily presented in slide show mode and can be exported as PDF.

Sutori has an analytics feature that allows teachers to check the amount of time that each student spend on the page (i.e. learning time) and their performance in quizzes. It can also be embedded into all leading learning management systems including Moodle, Canvas, Blackborad and Google Classroom. As shown in Figure 1, Sutori offers three levels of access control. Private setting limits the content to only the author, secrete setting allows people who have the share link to view the content, and public allows anyone to view the content.

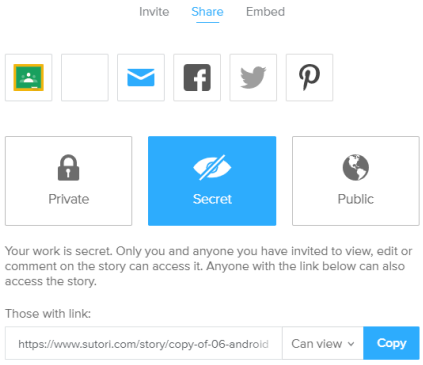

Figure 1　Three level of access control on Sutori.

2.2 User Interface

The user interface of Sutori is easy to use. All learning materials are organized along a timeline. As shown in Figure 2, one can easily create new content blocks by hovering mouse on the timeline and then selecting the type of content to be added. Sutori will automatically arrange the blocks aesthetically.

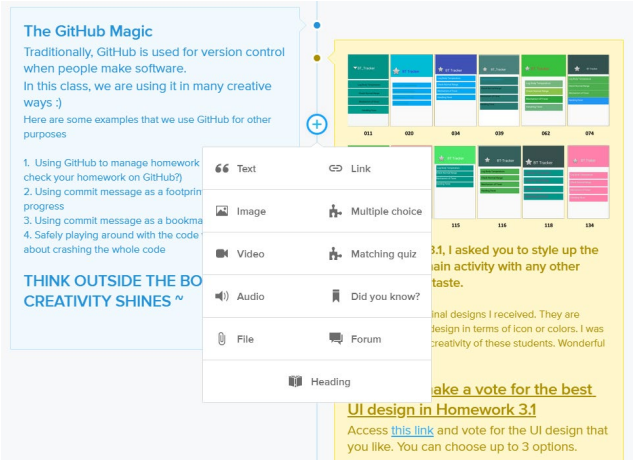

Figure 2　Adding new learning content on Sutori.

3. Results

We created a story for each class of the app development course. Figure 3 shows a segment of the learning content in one class. The first learning activity was to watch a tutorial video

about how to create a layout in Android Studio. After that, students were required to complete a vocabulary matching quiz. Some complementary learning materials were attached after the quiz to enrich students' learning experience.

Figure 4 shows the statistics of students' performance on the vocabulary matching quiz. Fourteen students got correct answers and nine students failed. A list of students' names will show up when mouse is hovered on the bar chart. The amount of time that students spent in learning this story is demonstrated in Figure 5. It shows that the amount of time spent varies a lot from student to student, ranging from about 5 hours to only a couple of minutes. This chart can help teachers estimate the difficulty of the learning content in addition to checking students' efforts.

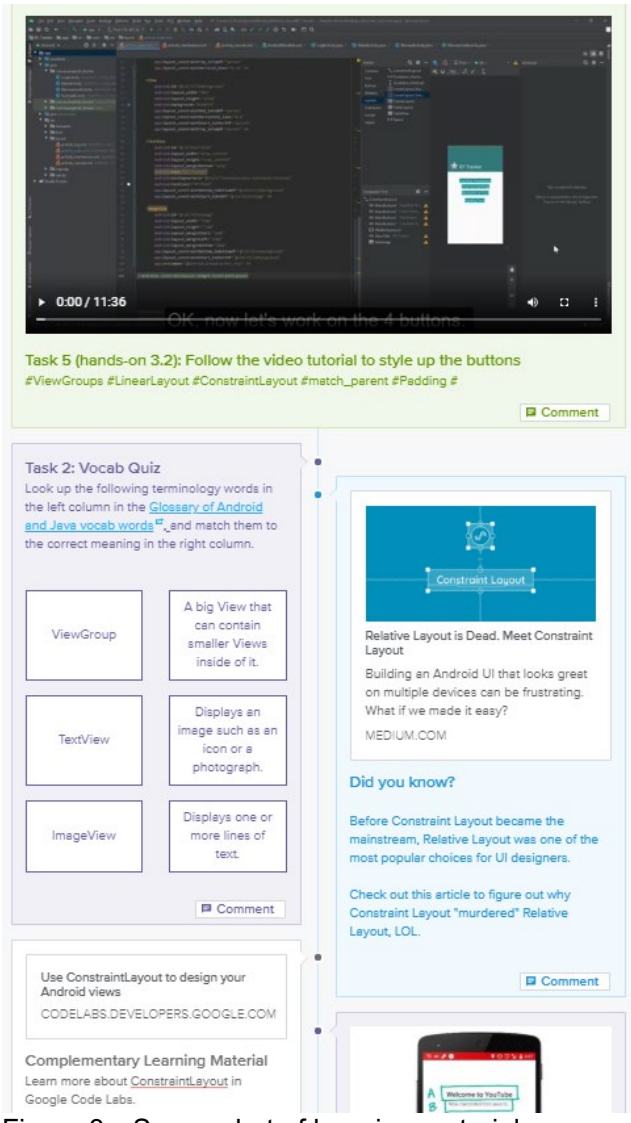

Figure 3 Screenshot of learning materials created on Sutori

4. Discussion

Sutori provides an aesthetic interface for presenting the learning material of an Android app development course to engage students. However, we encountered several problems. For example, there is size limit of uploaded media; large size PDF takes time to show up. Sometimes the content blocks fail to load. Also, it is not possible to track students' learning hours if they do not log in. Nevertheless, these problems do not overshadow the benefits of using Sutori in engaging students in online learning.

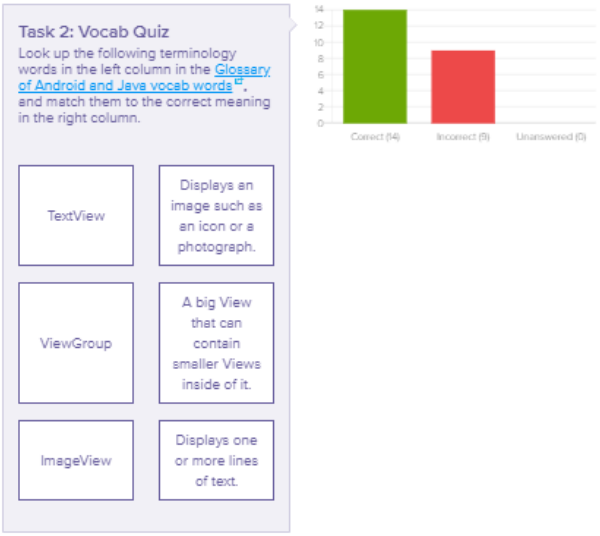

Figure 4 Statistics of quizzes

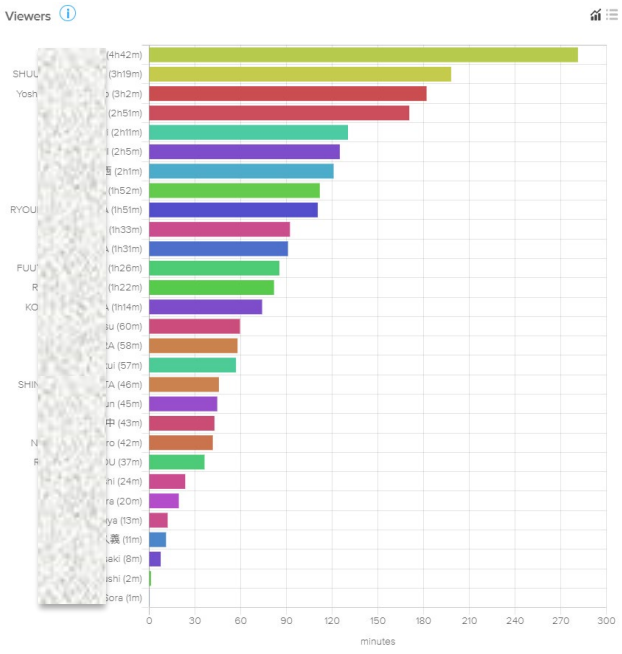

Figure 5 Statistics of students' learning hours

Reference

[1] Liang, Z. and Chapa-Martell, M.A. "Mitigating resource constraints in web development education using commercial cloud services", The 18th Forum on Information Technology (2019).
[2] Liang, Z. and Chapa-Martell, M.A. "A top down approach for teaching web development on cloud", IEEE International Conference on Teaching, Assessment and Learning for Engineering (2018).
[3] Liang, Z. and et al, "Beyond writing code: a new pedagogical model for teaching app development", JSEE Annual Conference International Session Proceedings (2018).