Draw It Out: Incorporating Lightboard Video Tutorials through Instruction

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Introduction/Need for Innovation

As technology establishes itself as an educational necessity, online and face-to-face instruction delivery must adapt to meet those standards. Video tutorials are one method to convey information through a visual and interactive format. Video-based instruction is generally accepted as improving learning outcomes when combined with relevant pedagogical methods (Yousef, Chatti, & Schroeder, 2014).

Much like a standard white board utilized in face-to-face instruction, a lightboard (e.g. learning glass) allows an instructor to write out complex equations or assignment instructions. Tutorials using the lightboard can include additional components, such as PowerPoint slides, to incorporate standard instructional techniques. Lightboard videos provide students with instructor-focused lessons that have the potential to improve achievement and engagement (Lubrick, Zhou, & Zhang, 2019). Lightboards implemented in a lecture setting had positive feedback because of the high contrast of colors that make the writing easier to see from afar as well as the ability to see the lecturer's facial expressions (Skibinski, Debenedetti, Ortoll-Bloch, & Hines, 2015). At [University], the lightboard allows instructors to create short tutorials for complicated topics that can be used in distance courses or as a supplement to face-to-face instruction.

How It Works

The lightboard is similar in design to a mobile whiteboard except it includes a framed glass area for writing. The specialized glass and its incorporated LED lights allow light transmission that illuminates neon markers, as well as the instructor standing behind the glass. At Texas Tech University, all instructional videos are recorded through Mediasite and published to a university-wide catalog, requiring a distinct configuration. Video is captured through a DSLR camera situated approximately five feet in front of the lightboard before being sent to a cross converter, which mirrors the video horizontally so text is legible. From the cross converter, video is sent directly to Mediasite, which controls recording and allows addition of supplemental materials such as PowerPoint slides.

Light interference is a delicate aspect of the lightboard, as too little light can conceal the instructor, while too much light can wash out marker colors. The lightboard includes adjustable LED lights that brighten the glass and the instructor, requiring a careful balance. The surrounding area must be completely dark and a black backdrop is essential for a consistent view of any incorporated writing. It is recommended that those using the lightboard wear dark, solid colors, although black clothing is not advised as it causes the instructor to blend into the background. Instructors wishing to utilize the lightboard are encouraged to prepare by constructing a storyboard of their entire video, which negates the need for post-production editing. As the lightboard requires a distinct set of steps to record a quality video, it is crucial that careful consideration is paid to each component.

Results to Date/Implications

Several lightboard videos detailing complicated topics such as HTML formatting and CSS selectors were created for a web design course at TTU. The lightboard was used to explain the individual topics so students understood the progression of the content with each

component building on itself systematically. Students were instructed to watch these six to seven minute videos outside of class time as a way to expand upon content discussed during the regular class time. Those enrolled in the course provided feedback about the three lightboard videos the course instructor created. The 21 respondents generally reported positive feedback, with the videos providing varying degrees of helpfulness. The students said the videos were beneficial to understanding the material and were delivered in an intriguing format. The visual component of the video was well received as students were able to pause and take notes as needed. In the context of this course, students said the videos were applicable, providing a valuable explanation of the topics. One student stated: "I think the lightboard is helpful for any lecture or topic that involves [visual content]. It is especially helpful for a class such as web design to have a visual image to learn from." Students in the class found this to be a viable option to supplement face-to-face lectures when needed as the information was presented in an engaging format.

Future Plans/Advice to Others

For the purpose of the web design course, students want to see additional lightboard videos to explain coding in Bootstrap, charts to complete a custom style sheet, and as a guide to complete course pack notes. The next step for the lightboard is to continue studying the effectiveness of this teaching tool in practice to see its impact on learning objectives. Lubrick et al. (2019) found one of the major benefits of an instructor present on screen was an increase in student attention spans. Moving forward, instructors should consider marker color choice, inclusion of various media, and different gestures to determine the impact they have on student engagement (Lubrick et al., 2019). These suggestions paired with student recommendations should lead to successful use of the lightboard.

To expand upon the current use of the tool for the Department of Agricultural Education and Communications, there are plans to use the lightboard for videos in other content areas. Feedback from students suggested the videos be used when outlining magazine layout design, describing basic design principles, and highlighting writing fundamentals. For the agricultural education discipline, we envision students enrolled in various courses using this technology as they prepare lesson plans and develop their teaching skills to expose them to a different method of content delivery. As additional videos are developed, the objective for the videos is to build upon each other to serve as a reference point for students as they progress through the program. As a department, we also intend to use the lightboard as a way to recruit future students and facilitate a seamless application process.

Cost/Resources Needed

Lightboard technologies range in cost, depending on the needs of the institution. Several websites feature plans for creating a do-it-yourself lightboard configurations (e.g. lightboard.info). Purchasing a prebuilt lightboard ranges from $2,000 to $6,000, which accounts for several board sizes, as well as tabletop or portable systems (Learning Glass Solutions, 2019). A standard DSLR camera is required, as the lightboard requires specific light settings for accurate display of the colors; this can run anywhere from $500 to upwards of $2,000. A $300 cross converter is required to flip the video, while a lavalier microphone is recommended for proper sound, costing about $250. Finally, it is suggested to have a dedicated room for the lightboard, as it requires a fair amount of setup prior to each use.

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