

Multimedia Integration in a Learning Management System

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Abstract

Greenwich Public Schools recent technology initiatives provide students and faculty access to computing devices and a learning management system (LMS). This combination potentially allows students' access to a variety of instructional materials in and outside of the classroom. There is limited access to expertly created and vetted third-party curricular materials that a teacher can integrate in assignment instructions in the LMS thus currently most instructional materials need to be created by each classroom teacher for their students. The creation of multimedia instructional materials and the use of third-party created video instruction can save teachers time in creating materials, allow students access to expert instruction in areas the classroom teacher may not be expert in, and potentially create more class time for the classroom teacher to help students individually during class time. This paper explores the incorporation of multimedia instruction in an LMS in a high school music class.

Keywords: multimedia, project-based, flipped classroom, learning management system, multimedia learning, K-12

Multimedia Integration in a Learning Management System

In recent years, the Greenwich Public Schools (GPS) technology initiatives have included the implementation of purchasing and distributing computing devices so all students and faculty have access to the same device. The high school uses Chromebooks now in the hands of all students and faculty for the past two years. Concurrently, the district implemented the use of a learning management system (LMS), Schoology. The combination of the hardware and software allows students on-demand access to data and materials provided by the district in a closed digital environment. In order to better implement the use of the LMS and make learning materials available to students, music teacher Barbara Freedman incorporated multimedia instructional materials into the LMS assignments for the introductory courses. Task oriented assignments culminate in a project in which students demonstrate their learning. These task oriented assignments lead to the larger goal of project-based learning in the advanced electronic music classes where students will have access to a variety of resources to complete projects.

Problem

Student access to vetted materials in the GPS approved technology-based learning environments are currently limited. Teachers have been able to provide teacher-created materials (video instruction, pictures, diagrams, and written materials) and other researched and vetted free materials (YouTube videos, non-copyrighted written works) through the school provided learning management system, Schoology. Content created by the teacher is limited to what the teacher can create or acquire in the time provided contractually by the district (David, 2008b; Lloyd, Byrne, & McCoy, 2012) and to the teacher's areas of expertise (Meyer, 2014).

In order to fully implement the district's technology initiatives, students need access to materials that will help them toward completion of their projects (David, 2008b) including task-

based learning and music content knowledge specific to the needs of their project (Tobias, Campbell, & Greco, 2015). Teachers are expected to provide direct instruction in a subject domain and “to inject knowledge from diverse sources such as textbooks, published articles, and internet-based resources” (Garrison, Anderson, & Archer, 2000, p.102). Currently, the district does not provide access to multimedia and video instruction resources other than freely available Web 2.0 tools. Third-party providers of video instruction by companies such as lynda.com, macprovideo.com, or groove3.com are not currently available to students or faculty through the district.

Third-party multimedia and video training companies already provide materials online that are accessible through a variety of computing platforms and devices including all Greenwich High School (GHS) installed computers and Chromebooks distributed to students and faculty. These third-party instructional videos are on the same and similar topics, content, and software addressed in the GHS electronic music courses. The district’s LMS can be used as a means to disseminate this content, information, and resources within the LMS assignment pages. A preliminary exploration of incorporating third-party video resource materials into the student assignment pages in the LMS provides students with instruction from experts not normally available to them. It also may allow students to complete assignments and projects at their own pace using the technology available to them in and outside of the classroom via the LMS. Third-party and teacher-created video instruction may also allow teachers more time during class to work with students individually instead of giving extended instruction from the front of the room.

Literature Review

In project-based learning, students learn by doing (Licht, 2014). Student engagement can be increased by the implementation of project-based learning as a teaching strategy (Tobias,

Campbell, & Greco, 2015). Students learn tasks, concepts, and engage in different levels of inquiry through completing projects geared toward those they might encounter in real-life situations (David, 2008a). Working individually or in collaboration with peers, students are engaged in realistic, thought-provoking problems that can improve student learning (David, 2008a). In addition to direct content related materials, cross-disciplinary projects also help students learn about a variety of disciplines in addition to the class content field of study (Burrack & McKenzie, 2005).

Multimedia can be defined as the use of more than one form of communication presented simultaneously (Mayer, 1997; Mayer, Moreno, Boire, & Vagge, 1999). The LMS can be used to disseminate information and assignments. Instead of creating purely text-based assignment instruction, multimedia integration in the assignment instructions can also reinforce instruction. In the case of the LMS, each assignment page is a multimedia instructional message (Mayer & Moreno, 2002) containing text, annotated fixed pictures, and video. The multiplicity of tools on a single assignment page, visual and auditory, builds in differentiation for a variety of possible learners intelligence (Gardner, 1993). Although there is text on the screen, the content to be learned is also delivered using video demonstration of the specific tasks to be accomplished in the software. This is in keeping with Mayer's (2014) multimedia design principals of modality and redundancy. Modality is when "people learn better from a multimedia lesson when words are spoken rather than printed" (Mayer, 2014, p. 393). Redundancy is "that people learn better from graphics with spoken words than from graphics with redundant spoken and printed words" (Mayer 2014, p. 392). The teacher can create multimedia assets including video. Additionally, a plethora of free or fee-based third-party materials is readily available on the Internet. Once

multimedia instructional materials are integrated into the LMS assignment pages, students may be more able to proceed on their own without a great deal of teacher intervention or preamble.

Making materials available through the LMS outside and inside the regular classroom time allows students access to instruction for project-based learning initiatives and can also be used to create a form of flipped classroom. The purpose of the flipped classroom is to make the best use of class time (Bergmann & Sams, 2014). The students review teacher assigned materials on their own through a multitude of materials made available by the teacher including video created by the teacher or other experts, multimedia materials, and interactive lessons (Licht, 2014). The teacher can spend more time in the classroom with students individually to help them with their learning needs and students can use class time to engage in activities and hands-on experiences (Bergman & Sams, 2014).

There may be many ways to flip a classroom (Bergmann & Sams, 2014) including having the materials used by students individually or in small groups during class time. Simply making the material available to students is not sufficient to integrate the approach of the flipped classroom (Tucker, 2012). Often acquired knowledge is checked by the teacher via student application of knowledge in the classroom through homework done in class (Wilson, 2013).

Using class time to have students either individually or together to answer traditional homework type questions, create assets, or to reflect on topics or concepts learned can deepen student understanding of the material. Bergmann, Overmyer, and Wilie (2011) noted, “When students are placed in teams, students teach each other, a powerful way of learning new material, since students can often explain the concepts to each other in a style more conducive to learning.” Extending this concept of group work beyond knowledge acquisition of basic concepts or tasks via lessons or homework into projects may expand student engagement and learning.

Proposed Research Questions

1. What impact does making multimedia assignment instructions available through the LMS have on student learning?
2. To what extent does making multimedia assignment instructions available to students through the LMS allow teachers' more time during class to assist students individually?

Example of Application

Greenwich High School (GHS) has been offering electronic music courses since 1969. The overarching principle for course design is for students to engage in music through applied learning of music creation by completing practical projects that reflect those that might be encountered by professional musicians, composers, producers, and audio engineers.

A preliminary exploration of integrating multimedia instructional materials into the district's LMS is being implemented in the one unit in the introductory electronic music course at GHS. This unit serves as an introduction to the graphic user interface (GUI) of the software GarageBand, some basic functions within the software, and an introduction to using the software for composing music. The student assignments existed previously as PDF handouts but the new design has fully integrated multimedia components, graphics, and video into the assignment page in the LMS. This unit has a culminating project that students might encounter in a real life situation, albeit prescribed and on a small scale, with the intention of preparing students for larger projects. This new design in the introductory course is more of a bottom-up step-by-step approach to acclimate students to the procedures of using the LMS and the embedded multimedia resources for self-paced learning. This preliminary exploration is a first step toward more fully integrating third-party video instruction in the LMS toward the goal of project-based learning in the more advanced electronic music courses at GHS.

Care was taken in observing copyright laws. The creator of the LMS multimedia assignments used either freely available video on YouTube (Web 2.0 materials) or obtained permission from third-party providers for integration limiting access to them to only those students who had access to the specific lesson in which they were loaded so not to encounter copyright violation issues. Future use of third-party provided materials could include authentication of student log in through the LMS that will mitigate the dissemination of student information to this third-party provider thus allowing the Greenwich Public Schools to comply with newly enacted Connecticut State Law (Public Act 16-189) that requires additional protection of student data. The third-party provider could provide authentication programming and support for access through the LMS.

Both formative and summative assessment projects require students to create something of their own, an asset, within the parameters of the assignment demonstrating knowledge assimilation. A rubric for each assignment and the culminating project was created and attached to the specific assignment page in the LMS. Students can see in the rubric exactly what the expectations are of the asset they create, item by item, and the grading weight scale for each item before they begin the assignment. These rubrics are integrated into the LMS grade book. The teacher can view each student's rubric, grade the assignment using a touch screen to select cells in the rubric, and add custom comments for each item and the total assignment. Students and parents have instant access to the grade and comments within the LMS.

Assessing the Efficacy of the New Design

Determining the efficacy of the new design can be through mixed methods research. The district LMS administrator has access to users date, time, and duration login information. It is being investigated if specific pages within the LMS can be tracked this way. This information

could be used to assess students' time on task. Of interest would be if students access information outside of class. Given these assignments were used in previous classes in previous semesters, this information could be collected from previous classes and compared to those that use the new design. Given the grading rubric for the assignments did not change in the new design, a comparison of grades could be made between students' grades in previous courses with those in courses that utilize the new design.

A survey could be given to students asking them generally about their experiences using the assignment pages in the LMS and the integration of multimedia materials in these pages. Questions specific to the students' experience using the third-party, teacher created materials could be included. Questions could also address students' feelings about learning outcomes and how it might have been affected by the inclusion of multimedia materials.

In order to assess the teacher's role during class time, it might be that one section of the course would be delivered using the old design and one with the new design. The teacher would have to keep detailed notes of class sessions and/or an additional researcher could observe live classes or video recordings of classes and create notes noting the teacher's time on instruction in front of the entire class and the time on individual help available during class.

Conclusion

Using a school's LMS, a teacher can disseminate a variety of information and track student progress. The integration of multimedia into the LMS assignments may foster independent learning and in the classroom self-paced student work. This kind of flipped classroom may afford students more time to engage in activities and create assets. It may also create more class time for teachers to provide individual guidance and support to students in the classroom.

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