UNIVERSITY of ST. THOMAS

RIME RESEARCH & ISSUES IN MUSIC EDUCATION
SEPTEMBER 2009 : VOLUME 7 : NO. 1

A Constructivist Application for Online Learning in Music

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Abstract

The purpose of this article is to extend the published knowledge and practices of distance learning in music to include constructivism. Dan Keast describes his techniques for the implementation of constructivism to an online two-course series of Music History. The courses' structure, activities, assessments, and other key functionality components are shown as an example of current practices. Keast discusses the process for developing the two courses, in conjunction with copy editors, course design specialists, and technology reviewers. The courses highlight the need for additional improvements such as new software and legal clarification for the use of sound recordings. Keast's suggestion for further research is a call for more educators to report on the current practices of online teaching in music and the other arts.

A Constructivist Application for Online Learning in Music

The year: 1988. The setting: a typical classroom at a midwestern university. I am in music history on a too-warm spring afternoon, listening to the drone of the professor's lecture and trying not to nod off. The needle drops on a scratchy recording of Beethoven's Fifth. Where's the copy of the score in this mess of papers? Now the instructor is shouting out measure numbers and pertinent details about the music, which I can't even hear because as the music gets louder, so does he. Is this how Beethoven went deaf? How long until class is over? Am I even learning anything?

The year: 2008. The setting: my faculty office. I am a professor, holding virtual office hours for my Music History I students who take the course online, at times that are convenient for them and under conditions that support their learning. Music listening examples online are of near-concert hall quality, and subsequent comments and questions generate lively discussions. Feedback is immediate. Students motivate one another to succeed.

Constructivism is inherent in most performance-based and applied music courses; students can apply new knowledge immediately and receive synchronous feedback, both from listening to themselves and from verbal and nonverbal communication from conductors and teachers. However, knowledge-based courses such as music appreciation, music theory, and music history, have historically relied on direct instruction and the lecture model. Various factors, including the nature of the topics being presented, class sizes, the physical nature of the lecture halls, and the training of the faculty members, have resulted in these courses being taught in teacher-centered, static ways. The advent of technology offers new opportunities for breaking this cycle and bringing contructivist pedagogy to knowledge-based music courses.

Although early attempts at distance learning formats for music classes often used a read-test model that mimicked the lecture-based format of face-to-face classes, more recent explorations are media-rich and interactive. My online teaching includes the construction of a fully online two-course sequence in Music History, originally taught face-to-face. The use of recorded music from my private library during the traditional course limited the students' ability to access the music after class. An online transformation of the course was logical so students could simultaneously access the recordings and have 24 – 7 access to the lecture illustrating an analysis of each piece studied in the curriculum. The online course took a year to design, build, edit, and review. During my tribulations of creating the online course, I discovered that the existing literature for online music teaching was limited, so this article is a description of my process for transforming an existing traditional version of Music History into a web-based version.

Learning Philosophies Informing the Online Course Design

Three important education theories form the foundation for this course. The central assumption of constructivism is that humans are active learners and must construct knowledge for themselves by using tools at hand to learn from their experiences. (Geary, 1995). The constructivist educator gathers materials for students to use in observing, collecting data, generating and testing hypotheses, and working collaboratively with others. The decision to teach using a constructivist paradigm gives students the choice to follow trails of interest, make connections, reformulate ideas, and reach unique conclusions. Through their course activities, students construct their own understanding of music history by investigating the topic then completing unit assignments. The resulting assignment is a means of assessing the student's understanding of the curriculum.

Scaffolding in online courses is the deliberate placement of tools for student use. During an activity, students need a varying amount of teacher support to complete a task successfully. When developing the course, a faculty member must project what question students might have at each step of the activity and provide assistance at the appropriate time or location within the lecture. The teacher's provision of tools at the appropriate time within the activity is considered scaffolding. By including scaffolding, an educator is controlling task elements that are beyond the learner's capacity so the student can focus on those features of the task they can grasp quickly.

In a face-to-face classroom, the teacher is able to walk around the room "dropping in" to check on each group providing immediate feedback and answering of questions. The embedding of expert video clips (Hmelo-Silver, Duncan, and Chinn 2007), reminders of task structure, or other helpful resources in the online course allow students to access help at each stage in the task completion similar to the face-to-face classroom described above.

Scaffolding can be "just-in-time" or as a learner-selectable option. The difference between the "just-in-time" and learner-selectable option is a matter of location. "Just-in-time" scaffolding is embedded within the activity. At any point where the instructor anticipated a learner may need assistance, a piece of scaffolding is hyperlinked or directly pasted in. An application of "just-in-time" scaffolding is when a word, person, or concept is hyperlinked so learners are taken back to previous topics which remind them of their prior knowledge, or even an alert box "pop-up" that defines a word. Learner-selectable scaffolding is located in a single location on the page that learners move to in order to access a variety of scaffolding. This latter technique is often used as a frequently asked questions (FAQ) list in non-education sites.

When a constructivist educator includes scaffolding in a course, they become a facilitator rather than a lecturer, by directing students to appropriate pools of information and enabling them to construct their understanding of a topic. Students are given the tools,

activity, and guidelines to complete a learning unit. Scaffolding a constructivist activity is challenging for the educator, yet rewarding for both the learner and the teacher when done effectively. The active and exploratory nature of a virtual student's use of scaffolding, and the motivational aspect of choices in constructivism, are of interest to me.

The tenets of Vygotsky's (1978) Zone of Proximal Development (ZPD) work well in an online course taught from a social constructivist base. The ZPD was developed by Lev Vygotsky and refers to the student's ability to complete an activity. The relationship between the instructor and the student is crucial to understanding Vygotsky's concept. The ZPD is considered "optimal" when a student cannot complete the task without some interaction with the educator. However, the task cannot be too difficult as to require the educator to be present during the student's entire engagement of the task. The goal is simply to provide a piece of information and leave the student to continue learning alone. Social constructivism includes the use of student interaction with the constructivist philosophy. With a mixed population of musicians and non-musicians in a Music History course such as this, the ZPD is large for group activities. The optimal place of learning occurs only when the student needs a "nudge" from the teacher in the form of a piece of information, and is then left to complete the task himself, without the teacher's presence. By asking students to form groups with specific roles in mind, the small groups are structured as a support team building upon the strengths of one another.

Activity theory is another philosophical framework by which we can understand how people learn. According to activity theorists Jonassen and Rohrer-Murphy, the activity is engaged in by a learner who is motivated to find the solution to a problem by using the tools supplied by the teacher and in collaboration with others. "Activity theory posits that conscious learning emerges from activity (performance), not as a precursor to it" (Jonassen and Rohrer-Murphy, 1999, p. 62). In several learning theories, such as Behaviorism, Social Cognitive Theory, and Information Processing Theory, the learning must occur before the activity. Activity theory, however, suggests that learning is a product of interaction with the environment and activity. In activity theory, each "activity is composed of a 'subject' (a person or group engaged in an activity), and an 'object' (a learning objective held by the subject), mediated by a 'tool' (that could be material as well as mental)." (Roussou, Oliver, Slater, 2008, p. 143). The overlapping relationship between activity theory and constructivism hinges upon the active nature of the learner, student use of tools in the learning process, and the collaboration of students in small groups in order to accomplish assignments.

My goals for the transformation to the online environment included the accessibility of resources, but also to make the course more actively engaging to the students. The influence of activity theory and constructivism on the virtual classroom was described by Scarnati and Garcia (2007, p. 2) as "allow[ing] a greater degree of engagement, self-motivated knowledge construction, and collaborative learning." The construction of the activities for these courses was also influenced by Salmon. Among her key principles for building online activities, which she refers to as "e-tivities," are three points:

1. Ensure that the activities are focused on sharing, shaping, elaborating, or deepening understanding.
2. Build in motivation as part of the process of undertaking the activity and not as something separate from it. Motivation occurs because of the learning activities. Avoid trying to motivate people simply to log on and "discuss." Instead, provide an activity that makes taking part worthwhile.
3. Ensure that participants need to work together in some way to achieve the learning outcomes. (2003, p. 88)

Related to Salmon's second principal is Jonassen's (1999) construction of activities based on the concept of an "ill-structured" problem – an activity mirroring real world situations that do not yield a particular, certain answer because of inconclusive or conflicting data.

Jonassen argues that an ill-structured problem is interesting, relevant, engaging, and will foster a learner's ownership of the activity.

Salmon's first principle echoes constructivist philosophy for creating deeper understanding through a research process. Sharing of one's understanding with the class, a social aspect, provides motivation to succeed. The third principle from Salmon, ensuring participants work together, also contains connotations of social constructivism in the fostering of group-structured activities to spur interaction and deeper learning.

The Online Music History Courses

Both Music History I and Music History II contain four units; each unit in the course includes four textbook chapters and requires students to author three two-page reflective papers. After reading the text and submitting the reflective papers, students are asked to read an online lecture presenting musical selections relating to the reading. At the conclusion of the lecture is a formative self-check covering material from the text and lecture. Additionally, a formative listening quiz self-check is offered so students can prepare for each unit's listening quiz. The listening quiz presents four audio samples discussed in the online lecture. To encourage use of this formative scaffolding, the students are informed that one of the audio samples, and its corresponding questions, is pulled directly from the graded listening quiz.

The courses use a variety of assessment methods, some constructivist-based and others more traditional. The constructivist assessments are intended to be problem-based, such as the individual assignments, group activities, and class discussion questions. The students create individual assignments (Exhibit 1) that are often pieces to be incorporated into the group activity, which leads to the discussion topic for the unit. The interconnectivity of the individual assignments, group activities, and discussions is engaging to the learner. The traditional methods of assessment include four listening quizzes, two multiple-choice exams, and reflection papers of the readings (Exhibit 2).

The social constructivist nature in online education is challenging for those not prepared to engage in virtual group work. The small groups collaborate in virtual classrooms, discussion forums, and via e-mail. After reading the lecture, students interact in their small groups creating projects drawing upon the lecture material. The activity is designed to be possible only with research beyond the material presented in the textbook and lecture. The lecture serves as the advanced organizer, while the small group researches and creates a project that is posted for viewing by the entire class. Activities often contain multiple roles such as sections written by various group members that comprise a larger project (Exhibit 3).

Discussion forums serve as the culminating activity of each unit. The discussion provides the opportunity for extending the reading, lecture, individual assignments, and group activities into the real world. As viewed in Exhibit 4, students are displaying higher-order, critical thinking skills such as synthesis, analysis, and evaluation suggesting that their understanding of the topic is deeper than factual memorization, but operational understanding.

Students take Music History as an elective in their history and psychology degrees, but also as a requirement of the music minor and major. Thus, course content must reflect the needs of both experienced musicians and non-musicians. Planning for each student's ZPD (Zone of Proximal Development) in the course is a difficult task. The activities I designed allow for small groups to give less-experienced musicians more of the assembling tasks, such as collating the parts of the presentation collected from their peers, while the more-knowledgeable musicians complete the challenging musical analyses.

Another difficulty, from an instructor's perspective, is training the students to know their abilities. In order to have them self-assess early in the course, students introduce themselves to the rest of the class using a checklist style of skills. The list covers several families of skills, from computer skills and music performing abilities to their individual preferences for writing, researching, and constructing projects. When placing the students into groups, the students analyze their peers' self-reported abilities and balance their suggestions for groups to include a musician, a technology person, a writer, and a researcher. After students post their suggestions and discuss the suggestions of others in the discussion forum, the instructor can finalize groupings and resolve any differences of opinion. Based on this early assignment, students are responsible for creating their own support system – their small group peers – while completing some of the course activities. Building this support structure reflects the deliberate use of social constructivist philosophy in the course. The students' freedom to create their virtual small groups is similar to facilitating a learning community in the face-to-face course. The virtual small group activities enable students to accomplish the course objectives mutually, using each others' strengths by collaborating to meet objectives, often surpassing stated expectations in the scoring rubrics provided in the assignment.

Scaffolding the Online Course

Scaffolding the courses includes the placement of resources available for student use in activities. One link I placed on each assignment screen, besides the 24 – 7 hotline for technical assistance, is the University of Texas Telecampus (http://www.telecampus.utsystem.edu/learningresources/library.aspx) virtual library hyperlink. This allows the students two synchronous methods of help. Other links include those to short video presentations for: narrowing a topic, creating appropriate search terms for use in library databases, avoiding plagiarism, and style guidelines. Through an e-mail link to the library's resource desk, students are able to ask the library staff for suggestions in locating materials pertinent to their topic, locating audio files in online listening libraries, and receive feedback.

Entry screens (Exhibit 5) to each unit provide students with step-by-step directions to complete the unit including objectives and activities. The page serves as an organizer for student progress through the unit. An introductory paragraph prepares students for the materials they will need to reference during the lecture (Exhibit 6). These steps are provided as organizational tools to show students a checklist approach to meeting the unit objectives. As discovered by Keast (2004), the student research process is meandering, so this checklist serves as a structural item in each unit.

Other links include the academic tutoring link to SMARTHINKING (http://www.smarthinking.com/) and the campus writing center that provides both in-person and online writing assistance. These resources provide tutors who give specific responses to each student's writing, personalized advice for strengthening a paper, style guidelines, grammar, topic development, and specialized assistance for ESL students. For a Texas educational institution, ESL assistance is especially beneficial since my institution is designated a Hispanic Serving Institution by the federal government based on our high percentage of Hispanic students.

Other scaffolding specific to this course are a formative self-check over the lecture and a formative self-help listening quiz. Music History courses utilize two-part assessments: written and aural. The written exam is similar to that in traditional courses such as history and math. The placement of a self-check to review the lecture allows students the opportunity to review major themes from the reading and lecture. Material on the midterm and final exams is drawn from lecture, textbook, and group projects posted in the discussion forums.

The listening quiz is different and therefore a challenge for some non-musicians. The listening self-help presents audio files paired with a bank of questions to assess a student's knowledge of that particular piece. The student must describe who wrote the piece, name the work, and discuss the structure or organizational form. Often the answers are supplied in the lecture, but there are instances in the listening quizzes when students are expected to hear an unfamiliar work and discuss the form using terminology from lecture. The self-help affirms that the audio technology is functioning properly on the end-user's machine.

Implications for Future Learning

Student evaluations of the course emphasize the rigorous workload while highlighting the thoroughness of course content: "I sometimes thought there was too much busy work for an upper-level course. However, all the work was relevant and there was something to gain from it." Another student commented: "I really enjoyed this course and the instructor's involvement in our learning." And in response to the survey question, "The instructor's teaching methods created an environment that encouraged online learning," 87% answered "agreed" or "strongly agreed."

Virtual office hours were maintained for students to leave asynchronous e-mail or to "chat" using the feature in the course menu. Only six out of 45 students logged in to synchronously speak with the instructor using the chat function. Another small portion called to ask specific questions. The vast majority utilized email which was generally responded to by the instructor within a few hours. I do not think the continuation of chat is a valuable use of an instructor's time if there is a quick reply to email.

At this time, I believe the addition of a few essential components would improve the course: 1) an interactive quiz mechanism that delivers up to ten questions at once using a single audio file; 2) a Flash-type file that shows a musical score with the current measure highlighted as the sound file is played; 3) the "interactive syllabus" of Sylvie Richards (2003), aptly renamed "assignment guide" by Scott Windham (2008), and; 4) a method of legally using audio files in distance education.

The current method of quiz question delivery is all at once – every question with its own link to the corresponding sound file. The delivery of a set of ten questions, all dealing with the same sound file, is essential to effective student assessment. Currently, students are forced to check the audio file for each question, when they should be given the directive "the next ten questions reference this piece of music." The effect on student assessment is frustration, lengthened quiz time, and sluggish servers at peak times, such as in the hours leading up to a quiz closing.

In traditional face-to-face Music History courses, a PowerPoint file was used for focused listening lessons. Before the days of the computer, the instructor shouted measure numbers over the stereo. The media-rich technology of today's online environment is limitless, yet course designers struggle to create a Flash file of a musical score timed with an audio file to a reliable online format. The Macromedia Flash attempts, to date, are damaging to either the visuals or audio. Additionally, the technology is cumbersome to highlight the place in the printed music in conjunction with the recording.

When using learning platforms such as Blackboard or WebCT, course designers prefer to use packaged files for items such as the course calendar, units, and syllabus. While this approach creates opportunities for enhanced visual appeal, it limits the ability to link to files externally. For instance, hyperlinking an assignment in the calendar (inside one package file) to the actual assignment (within a different package file) is, at this point, highly problematic. My proposed solution would be to create stable links or abandoning the use of package files. The result would allow faculty uninhibited linking within the course.

The final missing piece is the Achilles' heel of music education. Because music is an aural art form, our students must listen to music to receive course content, and ultimately learn. New directives from universities' general counsels are suggesting the avoidance of sound in online music courses (Exhibit 7). The concept is frustrating to those adapting curricula to use only the works placed on a student's textbook-supplied CD. Pieces highlighted by one instructor may not be the same as another. The legal limitations are constraining and deserve additional guidance and resolution by legal authorities. Baruch (http://www.baruch.cuny.edu/tutorials/copyright/) created a helpful presentation, but the UT System (http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm#music) is conservative in its approach of recordings used online.

So, how will Music History be taught in 2028, compared with today? There are many experiments currently underway by music educators. Their discoveries will inform and improve future educational endeavors. It is time for them to publish their methods, successes, and failures so that all may gain from them.

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