Instructional Design: Piano Basics for Online Mobile Learning

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Abstract: The direct correlation between cognitive wellness and applied music knowledge has been effectively demonstrated and empirically proven by a wealth of research studies to be a powerful cognitive development tool for people of all ages. Recent studies have shown that the listening and playing of musical compositions on the piano helps to stimulate and enhance an individual's cognitive "working memory" and spatial-temporal reasoning, which is widely applied in work related fields such as art, architecture, mathematics, engineering, and science (Wang, 2013). This online instructional module was geared toward the introduction and facilitation of basic musical concepts and principles for the piano as a foundational springboard for cognitive wellness. The module was delivered via an interactive web-based interface supported by videos and supplemental learning materials. The study findings revealed a substantive increase in score improvement between pre and post quizzes. Survey results also indicate that the large majority of participants found they learned more from the module than they had originally anticipated and that they feel more confident in their understanding of the piano. The data collected from this study could be used to assist other educators interested in revisiting and refining the module’s didactic approach.

Introduction

What is the need for emotional and intellectual acuity and how does the listening and learning of music help to broaden and strengthen the human condition? Since its earliest origins, the employ of music has and continues to play a fundamental and pivotal role in the way societies around the globe engage in cultural and spiritual traditions. For many, music is an emotively soulful method of human expression that crosses the barriers of language, nationality, age, religion, and culture. For some, music is a central key toward the development and enrichment of cognitive processes within the pedagogical context of cognition and instruction (Chabra & Misra, 2013).

The need and desire to improve one's cognitive abilities by way of music learning has proven to be an appealing, effective, and rewarding endeavor that has a direct psychological and physiological connection toward learning. As a way of addressing the intrinsic and extrinsic need for intellectual stimuli, the intended purpose of this instructional design project is to develop and
evaluate a web-based instructional module teaching beginner level adult music students how to properly identify and actively engage in the playing of chords and scales on a contemporary piano keyboard.

Background

With the technological inception and global proliferation of digital information via the Internet, access to a vast knowledge base of music instruction is readily available to individuals seeking to learn how to play a musical instrument with the mindful goal of obtaining emotional and/or cognitive benefit. While information is abundant via free and subscription based instructional sites and social media hubs such as YouTube, Vimeo, and Lynda.com, in a number of cases the information conveyed is not intuitive and cohesive, making for an ill-conceived development and delivery of instructional principles and concepts (Herbert, 2007).

Despite this fact, a recent research study conducted by Horspool and Yang (2010), confirm that positive student perception toward Internet-based music instruction is equally on par with face-to-face instruction, with the consideration that the context, materials, and methods that are being delivered and explored are practical, relevant, and fun. With the ubiquitous use of mobile tablets and web-based applications, the growing community of online learners are swiftly becoming a more savvy and open-minded caste of scholastic Netizens (Kirkwood, 2008). This new progressive mindset makes for a much more receptive, eager, and enthusiastic group of online music learners, particularly when you consider the quantitative and qualitative benefits associated with music study within the context of emotional and intellectual development.

According to Hyde et al. (2009), exposure to music training has been shown to induce structural neurological changes (brain plasticity), which is directly linked to behavioral changes associated with an individual’s mood and attitude. From a qualitative standpoint, mood and attitude is an important aspect toward learning. As a pianist and graduate student, having the ability to sit at the piano for a short period and “unwind” with the playing of musical pieces has proven to be a huge benefit in terms of the way I approach my graduate studies. I am much more relaxed and receptive, which makes the assimilation, comprehension, and retention of my course materials much more manageable, given the shift in mood and attitude, which results in a more calm and peaceful state of mind.

In a Quality of Life (QoL) study conducted by Lee, Chan, & Mok (2010), the listening and playing of music has proven to be a non-invasive, therapeutic method of improving mood and stimulating interest while reducing situational anxiety in adults. This study has shown that the listening and playing of music can be an effective way of reducing stress and anxiety among individuals, which in turn helps to promote feelings of happiness and emotional enjoyment, directly improving an individual's quality of life.
Methodology

The instructional module incorporates a mixed-method approach geared toward the need to effectively measure quantitative student learned outcomes and qualitative student perceptions in the form of participant attitude and subjective opinion toward the course materials. Presentation of subject material was delivered in the form of downloadable digital PDF documents and MP4 video playback files chunked in 5 minute sessions for manageable assimilation and synthesis of each module unit. Examples and non-examples were incorporated into the instructional module via self-directed, self-paced iPad applications with the adjunct instructional purpose of providing the student with supplemental, interactive feedback and guidance.

Instructional Strategies

The ADDIE Instructional Design model was used as a framework guideline for analysis, design, development, implementation, and evaluation of an effective instructional online module. Gagne's Nine Events of Instruction was also utilized throughout the instructional module to help guide both the internal and external conditions of behavioral learning.

Technologies

Learning content for this instructional module was created using multiple applications, including but not limited to, Camtasia Studio 8, Microsoft Word 2013, and Weebly. Video production of multimedia video content was done entirely within Camtasia Studio 8. Microsoft Word 2013 was utilized in the creation of PDF documentation, supplementing the instructional video media. An online account with Weebly.com was used to create the online web portal hosting the interactive instructional module (http://graduateproject.weebly.com).

Population

The target population for this instructional module consisted of adult participants between the ages of 18-65 with no formal musical experience. The demographic makeup consisted of both men and women of various ethnic and socioeconomic backgrounds. Participants of this project possess basic computing skills (having the ability to navigate a web-browser and touch-based tablet interface). In addition, participants of this study should have a moderate degree of intrinsic interest and personal desire to learn to play a musical instrument.
Data Collection

A combination of quantitative and qualitative data was used in this study. Data collection was entirely web-based with pre- and post-tests conducted via online data gathering tools for both desktop and tablet. An account with PollDaddy.com was created with the explicit intent in delivering embedded tests and surveys to compliant participants of the study within the online web portal. Multiple choice questions were utilized in the initial assessment survey and quizzes. A 5-point Likert scale was employed as a measuring instrument for determining the attitudinal disposition of the participants after completion of all four learning units. Microsoft Excel 2013 was used as both an analytic and graphics creation tool for collecting data from PollDaddy.com and creating the required charts and graphs from the aggregated information.

Over the course of the implementation and data collection process, a variety of issues were made apparent, which directly affected the size of the participant pool. The initial response from the solicited invitation correspondence garnered a base total of 38 interested participants. The total number of participants that completed the consent form was then reduced down to 22. Due to random errant entries that did not tie back to the anonymous ID numbers provided in the initial consent form, or incompletion of the survey (in part or entirety), the overall count of participants who successfully completed all four quizzes and both pre- and post-surveys was narrowed down to 16.

Findings and Results

From the collection of 16 active participants, 11 respondents were female (69%) and five were male (31%). An overwhelming majority (88%) were of Asian / Pacific Islander descent with only two participants (13%) representing the Caucasian ethnicity. The following age distribution is broken down respectively: 32-38 (44%), 39-45 (19%), 46-52 (19%), 53-59 (12%), and 60-65 (6%). When it comes to attitudinal comfort level with computers, 13 participants (81%) stated that they consider themselves very comfortable with computers while the remaining three participants (19%) are only comfortable (see Figures 1 and 2).
When asked about a computer's effectiveness as an all-purpose tool, all 16 participants (100%) responded in the affirmative. However, from the 16 only 11 participants (69%) thought that they would be able to learn how to play the piano via a computer-based lesson module while the remaining five participants (31%) have an uncertain outlook on a computer's effectiveness as a learning tool for the piano. During the attitudinal survey, 14 participants (88%) strongly agreed that they felt they learned more than they thought they would from the module, while one participant (6%) only agreed and one other participant (6%) was neutral (see Figure 3 and 4).

Based on music interest, all 16 participants chose a minimum of three musical genres each. Classical and Jazz were at the top and Country and Electronic were at the bottom (See Figure 5).

When asked if the learning materials helped to prepare participants for the summative post-test, nine participants (56%) strongly agreed, five participants (31%) agreed, and two participants (13%) were neutral. Upon completion of the attitudinal survey, participants were asked whether
they felt more confident in their understanding of the piano with regard to its basic concepts. From the pool, 14 participants (88%) responded yes, one participant (6%) responded somewhat, and one participant (6%) responded no (See Figure 6 and 7).

![Figure 6. Did the Materials Help Prepare for the Post-Test?](image)

![Figure 7. Do You Feel More Confident?](image)

Based on the results from the pre-test quiz, only six participants (38%) scored above 70 percent. The average participant score from this test was 12 out of 20 questions (61%). Upon completion of all four post-test quizzes, all 16 participants (100%) scored above 70 percent. This percentage scale is based on the common passing score needed for a course credit. The average participant score was 36 out of 40 questions (90%). The overall percentage of improvement from the initial pre-test quiz to the summative post-test scores is a respectable 49 percent (see Figure 8).

![Figure 8. Percentage of Improvement](image)
Discussion

As part of a preliminary assessment survey, participants were queried with basic demographic questions including an exploratory review of attitudinal perceptions toward computers and an evaluation of participant's musical knowledge in terms of their personal level of musical interest and experience. While the research findings show little if any direct correlation to a participant’s age, gender, ethnic background, education, and or marital status, as a result, it is important to note that the participant pool size for this study should not be considered an accurate reflection of a much wider and more diverse social demographic.

When it comes to computer comfort level, all 16 active participants consider themselves to be comfortable or very comfortable with the use of computers. This early statistic proved to be invaluable to this study due to the somewhat challenging self-paced nature of this online module. For the most part, participants of this study were able to navigate and access the website, documentation, and applications with limited assistance from the researcher. This is not to say that the website's design was flawless. On the contrary, there were several areas in the online module that could have been improved upon.

Areas of Improvement

From a navigational perspective, the embedded survey forms proved to be confusing for some participants due to promotional “advertisement” buttons within the PollDaddy.com surveys. This led to a number of participants missing the pre-test quiz because they clicked on the “create your own survey” button that PollDaddy purposely solicits at the end of every survey form. Since the researcher elected not to pay the hefty yearly subscription fee, he was not able to eliminate the deliberate misdirection from PollDaddy's advertisement buttons.

This marketing ploy had a direct affect on the size of the participant pool. In those few instances where misdirection prevented the completion of the pre-test quiz, the results from the post-test quiz could not be used because there would be no contrasted measurement to determine the overall percentage of improvement.

During the attitudinal survey, participants were asked to provide constructive input regarding any potential improvement changes they would make to the module if given the opportunity. There were a variety of excellent and thought provoking suggestions that would definitely assist in making the website more desirable. One participant posed the question, “How about giving a button that will take the learner to the next lesson?” As it turns out, this inquiry was part of a trend of responses that followed the same line of reasoning. Participants wanted a more linear approach in terms of drilling through the module without having to return to the main menu.

Another popular request was for videos that provided instructor led sessions on the keyboard. I found this advice both fascinating and significant given that my decision to exclude instructional
demonstration on the piano was deliberate, based on my own personal experience coaching people on the piano. Over the years, I have found that interested individuals find the keyboard more intimidating when I sit with them at the bench. Part of the difficulty is due to their inability to adequately see the chord positioning through my hand and finger placement. The other part comes in the form of comments like “I can’t make my fingers do what your fingers are doing” or “There is no way I can do that with both hands.” These types of issues made me consider a more visual approach that I have always felt was successful in graphical business presentations and educational programs like Sesame Street and The Electric Company. However, with strong constructive feedback such as “I would like to see hands on video so I can hear and see finger strokes” and “It would have been neat to see/hear Boy demonstrate some of the examples in the videos”, I can definitely understand and appreciate the desire, appeal, and pedagogical value for hands-on physical demonstration.

**Reflective Analysis**

Based on results from the study, it became apparent that an online approach can prove successful in spite of potential limitations associated with an asynchronous learning environment. While this online instructional module lacked direct feedback from a physical music instructor, the use of progressive interactive multimedia tools have shown, within the scope of this research study, that delivering effective instructional content can be highly conducive toward the assimilation and synthesis of presented content material.

Upon completion of the study, it was shown that the overall participant attitude toward the instructional module was positive in terms of increased confidence level and the unanticipated surprise of participants learning more than they thought they would. The responses provided in the attitudinal survey reveals a firm and decisive approval rating from the study's participants, suggesting that the didactic methodology and effectiveness of the module's instructional design is on track and pointed in the right direction.

**Conclusion**

Based on favorable results from the study, the researcher recognizes the need and importance of learning music by way of an online web-based instructional module. With an improvement score of 49 percent averaged across an active pool of sixteen participants, it would be fair to say that the general outcome in terms of design, development, and implementation of the online module was successful.

While there were a few minor hiccups along the way, quiz scores and constructive feedback from participants helped to lend positive credence to the module’s applicability and suitability as an online didactic tool. Overall, the study recommends that the instructional video should include hands-on physical demonstrations. As a means of providing a more linear learning experience, adjustments to the navigational buttons should be made. In addition, Survey/Poll/Quiz online
tools should have a subscription to avoid advertisements that could have a direct effect on the study results.
References


