DIGITAL RESOURCE EXCHANGE ABOUT MUSIC (DREAM): PHASE 2 USABILITY TESTING

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ABSTRACT

The Digital Resource Exchange About Music (DREAM) is a virtual space for exchanging information about digital learning tools. The purpose of the present study was to determine how users responded to DREAM in the first four months after its public release. This study is the second phase of usability research on DREAM, and was conducted to guide future development of the tool. Research questions were designed to determine patterns of use for DREAM, the most popular resources, and gaps in the DREAM resources, in order to guide further design and content development. The primary data sources were site analytics, supplemented by an online survey and feedback from teachers who took part in a DREAM workshop. Results indicated that DREAM is steadily gaining users, and that the tool is effective and satisfying for music teachers as a way of keeping abreast about digital learning tools, especially for resources for ear training and sight reading. The paper concludes with suggestions for design enhancements and ways of broadening the user base.

KEYWORDS

Digital music tools, learning objects repository, music education

1. INTRODUCTION

Digital applications for music education have been growing at an astonishing rate, and these resources are changing the ways people teach, learn, and make music (Burnard, 2007; Partti, 2012; Rainie & Wellman, 2012; Waldron, 2013). While the use of digital tools in classroom music settings has a long history and is well described in the literature (Savage, 2012; Webster, 2012), the use of digital tools in studio music instruction is less prevalent (Upitis & Abrami, 2014). In both instances—classroom music teaching and private studio music instruction— obtaining information easily and swiftly about these new tools is important so that teachers can assess the appropriateness of such tools for their students' needs in a timely fashion. However, teachers are perennially time-starved and are often unable to systematically examine and evaluate the resources that are available. Consequently, classroom teachers often rely on interactions with their colleagues to learn about new technologies (Savage, 2012). But independent music teachers often work in isolation (Feldman, 2010), making these informal discussions about resources more unlikely and certainly less than comprehensive. Thus, a tool that provides a centralized place where independent music teachers can keep abreast about new digital technologies for their field has the potential to assist music teachers considerably. It is this type of tool that was examined in the present study.

The Digital Resource Exchange About Music (DREAM) is one of a suite of four digital tools for music learning. The first tool in the suite, iSCORE, supports students in their path to becoming self-regulated musicians. Two tools that are presently under development include an iOS mobile app for annotating music videos called Notemaker, and another web-based tool called Cadenza, which, like iSCORE, also supports student self-regulation. These tools were designed by a research and development team comprised of members from two universities and a national music conservatory (Upitis, Abrami, Brook, Troop, & Varela, 2012). DREAM was designed by our team to encourage teachers to learn about digital resources related to learning to play a musical instrument following the Western musical tradition, both in classroom and studio settings. DREAM enables teachers to evaluate the resources, to read about other teachers' views of the resources, and to add resources of their own to the digital learning objects repository. In the release version

(DREAM, v. 1.4), over 3,000 high-quality English and French resources were organized into six categories: (a) musical repertoire, (b) ear training and sight-reading, (c) practising, (d) history and theory, (e) creating and composition, and (f) professional resources. All of the entries in DREAM are searchable by title and key words, and users can also filter the resources by instrument, ability level, or platform (e.g., by type of tablet or smartphone). DREAM recommends resources to users based on their prior choices. We characterize DREAM as a Trip Advisor™ for music teachers—but instead of choosing a hotel based on such filters as free parking and breakfast, the teachers choose, for example, musical repertoire, filtering for instrument (e.g., piano) and difficulty level (e.g., advanced). In the four-month period immediately after launching the tool, the resource base grew to nearly 3,500 entries, the bulk of which are in the repertoire category.

In this age of ubiquitous and accessible digital tools, it is essential that DREAM operates in a way that is seamless and efficient for intended users. Even though DREAM is essentially an educational tool, the expectation from users is that it will function as seamlessly and professionally as commercial products, such as the Trip Advisor™ described above. The process of usability testing involves learning from test participants that represent the target audience. These test participants help determine the degree to which the product meets its goals (Rubin & Chisnell, 2008; Yadrich, Fitzgerald, Werkowitch, & Smith, 2012). Rubin and Chisnell (2008) assert that a usable product must be "useful, efficient, effective, satisfying, learnable, and accessible" (p. 4). In a similar vein, Barnum (2011) states that tools should be easy to learn, easy to use, intuitive, and fun. Barnum notes that the International Organization for Standardization (9241-11) defines usability as, "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (p. 11). Rubin and Chisnell embellish this definition of usability by noting that one of the most important aspects of making something usable is the "absence of frustration in using it … [so that] the user can do what he or she wants to do the way he or she expects to be able to do it, without hindrance, hesitation, or questions" (p. 4). The parallel idea in Barnum's (2011) work is the notion that usability should be invisible, that is, the built-in usability of products suits the user so that the user doesn't have to "bend to the will of the product" (p. 1).

Before releasing DREAM to the public, an extensive usability testing protocol for DREAM was designed, and has been reported elsewhere (Upitis, Abrami, Brook, Pickup, & Johnson, 2015). During the first usability study, the DREAM design and contents were modified on the basis of the input of 12 core test participants and designers, a group of 24 classroom music teachers enrolled in a teacher education program, as well as 47 studio music teachers representing eight of the thirteen provinces and territories in Canada. The results of the Phase 1 usability study gave support for the conclusion that DREAM could serve as a centralized place for music teachers to keep abreast about digital technologies, providing a tool that would be valued by music teachers in terms of efficiency and effectiveness. Further, the usability study provided evidence that DREAM would be enjoyable and efficient, so long as the team continued to vet resources, provide reviews, and otherwise ensured that only the highest quality resources would be included.

DREAM (v. 1.4) was released on September 4, 2014 with a single email announcement to approximately 30,000 users through the database of The Royal Conservatory (RCM), a national music conservatory in Canada. Most subscribers to the database are from Canada, although a small number live in the United States, where the RCM also conducts music examinations. Since that time, our data reveal that all new users have joined DREAM primarily by Internet searches and word of mouth. As recommended on the basis of the first usability study, a small team of music teachers has continued to vet new resources from outside users, provide reviews of the most popular resources, and add new resources as required to fill gaps, such as recordings for instruments other than the piano. Further, DREAM has been presented to various teacher organizations both for information and feedback, and several professional publications for independent studio teachers have featured short descriptions of DREAM. Overall, the first four months are best characterized as a "soft launch," that is, a gentle introduction to the tool rather than a strategic marketing plan, the latter of which the developers will undertake after the results of the present study are incorporated in Version 2 of DREAM. Strategic methods for marketing digital tools have been in use for several decades (e.g., Downes & Mui, 2000; Edelman, 2010; Ryan, 2014). While most of these sources examine marketing strategies for businesses, it is clear that an educational digital tool, like DREAM, could be launched using similar strategies, some of which will be explored in the final section of the paper.

Thus, the purpose of the present study was to describe and analyze the first four months of use to guide further development of the tool and to identify strategies for expanding the user base. The research questions for this second phase determined: (a) patterns of use for DREAM (b) which pages and categories were most useful, (c) what gaps were identified by users and developers in terms of DREAM resources, and (d) what features of DREAM require further development to increase user satisfaction.

2. METHOD

2.1 Data Collection

The primary sources of data were the site analytics tracked by Google, as well as by the host server. These site analytics included data on user numbers, page views, countries of origin, new and returning users, and information about the time spent on various parts of the site. There were two secondary sources of data: a focused survey and feedback from music teachers who took part in a workshop on DREAM. The focused survey was targeted to DREAM users through the project website as well as through Facebook. The survey contained one question regarding teachers' use of DREAM to triangulate with the site analytics data regarding which of the six categories of resources were most often accessed. In addition, we asked a series of usability questions, including whether they shared DREAM with their students and colleagues, whether DREAM had changed their teaching, whether the resources were useful, and finally, whether there were any changes that they would make to DREAM in terms of content, function, and design. Feedback from the teachers taking part in the workshop focused on design aspects of DREAM, notably the browse and search functions. In total, 22 teachers provided comment through the survey or workshop.

2.2 Data Analysis

Open-ended questions from the targeted survey and workshop feedback were analysed according to the research questions described above. Descriptive statistics were compiled from the closed-ended survey questions regarding patterns of use. Site analytics were gathered and compared from the two sources to compile a portrait of user information as it pertained to the first four months post-release.

3. RESULTS

3.1 User Characteristics and Patterns of Use

Over the four-month time period from September 4, 2014 to January 4, 2015, DREAM received over 40,000 page views. Nearly a third of the users returned to the site after their initial exposure to the tool, coming back to the site both to access and to contribute content. Over the four months, nearly 5,000 new users accessed DREAM, mostly to view content. Users can view content without creating an account; however, to add content or to comment on resources in the digital repository, an account must be created. Of the new users, only 187 people (4%) created an account. This is not surprising, given that many users will simply use DREAM to locate resources and have resources recommended to them, and not be interested in adding new resources or reviews of their own. Earlier we characterized DREAM as a Trip Advisor™ for music teachers; many people who use Trip Advisor™ to make travel plans never provide a review upon their return.

As can be seen in Table 1, users of DREAM typically spend just over three minutes on the website, browsing six pages on average. This means that they go well beyond the home page, and likely search or browse until they find the resource they are seeking. There is also a difference between new and returning users. New users access approximately three pages, while returning users engage with six or more pages each time. Thus, it appears that users who find DREAM helpful return each time for longer and longer sessions. In addition, this result does not include the time that they may spend learning more about the resources that they locate through DREAM. In the workshop with teachers, we observed that teachers would browse through two or three resources, and, finding one that piqued their interest, they would then leave DREAM and spend time examining the resource they had identified on the webpage dedicated to that particular resource.

Table 1. Overview of site analytics

Measure	
Unique sessions	6,778
Users	4,788
Page views	40,091
Pages visited per session	5.91
Average session duration	03:28 minutes
New users	70.1%
Returning users	29.9%

The site is predominantly accessed via Windows operating systems (45%) followed by iOS mobile devices such as iPhones and iPads (25%), Macintosh computers (19%), and Android mobile devices (8%), with the remainder being accessed through BlackBerry, Linux, Nokia and Windows Phone. The most popular browser is Safari (34%), followed closely by Chrome (30%). Firefox and Internet Explorer combined make up another 25%. Nearly two thirds of the visitors are from Canada (64.78%), with a notable number from other English-speaking countries, such as the United States (13.93%), and the United Kingdom (2.15%). Some users are from other countries in Europe, as well as Hong Kong. The users are predominantly English-speaking (83%); fewer than 2% are currently accessing DREAM in French.

As noted previously, the resources in DREAM are divided into six categories. In descending order of popularity, the resources accessed were (a) musical repertoire, (b) ear training and sight-reading, (c) practising, and (d) theory and history. The remaining two categories, namely, creating/composing and professional resources, were rarely accessed, indicating that these resources were less important to teachers.

These patterns of use correspond to the results of the survey and feedback from the teacher workshop. Every teacher we observed in the workshop, and every survey respondent reported that they used DREAM to find ear training and sight-reading programs and apps. While repertoire had more page views, the number of page views of ear and sight resources is proportionately much higher. Near the end of the four-month period that this study took place, there were 2,964 repertoire resources in DREAM, compared to only 44 ear and sight resources. This means that 85% of the resources were repertoire pages, and a mere 1.25% of the resources related to ear training and sight-reading—yet they were accessed nearly as often as repertoire. Put another way, in terms of the total page views, repertoire accounted for 5.24% of the page views, and the ear and sight resources represented 4.40% of the page views. The importance of the ear and sight resources to teacher pedagogy was also reflected in the open-ended comments on the survey. One teacher noted, "The ear training and sight-reading apps I've located have been particularly handy… I also extolled its virtues in an article about the sight-reading apps!"

3.2 Further Survey and Workshop Results

The site analytics do not give a direct indication of whether the resources recommended by DREAM are useful to users, although certainly the high rate of returning users is an indirect indication of user satisfaction. Consequently, to learn more about usability, survey respondents were asked directly about whether DREAM resources were useful, and every respondent answered "often" or "sometimes", with over 60% selecting "often." The categories of rarely and never were not used. Another indication of user satisfaction from the survey results was that every respondent indicated that they have told colleagues and/or students about DREAM. As to changes in pedagogy, most respondents indicated that it was too soon to tell, although those respondents who indicated that DREAM has improved their teaching commented on the usefulness of ear training and sight-reading apps, repertoire, and instructional videos about learning. One user commented on the importance of peer reviews of the resources.

At this stage in the development of DREAM, it is important to ascertain whether there are design changes that should be incorporated in Version 2. If users have concerns about DREAM, they tend to center on the search function. Some users are confused about the difference between browse and search; others have requested a more sophisticated search function that would enable them to make greater use of DREAM. A few users have suggested that repertoire should support more platforms (DREAM presently supports YouTube, but not, for example, Vimeo).

Other directions for improving the design of DREAM and increasing the resources include working closely with music conservatories worldwide to identify additional resources of both global and local interest. Asian, African, and Middle Eastern music are not well represented in DREAM and this is also a way to enhance the repository. In addition, seldom used and poorly rated resources might eventually be held aside.

Finally, the site analytics indicate that most users access DREAM directly, using the URL to visit the website. The remaining users often find the site using search engines. A small minority of users come from site referrals and social media. These results will guide our strategies for increasing the DREAM user base.

4. CONCLUSION

For a specialized tool for music educators that was launched in a low-key way, the first four months of use of the DREAM tool was impressive. The number of page views, especially for resources in the ear training and sight-reading category, was considerable. Many teachers also accessed the apps and other instructional resources designed to support student practising. This is not surprising, given that teachers often identify that one of the perennial challenges of instrumental music instruction is to guide student practice and to provide scaffolding for students to become proficient sight-readers (e.g., Hallam et al., 2012). The results from the present study, which point so strongly to the importance of these types of sight-reading and practising resources, will help us focus on new content in these categories. Given the results, other design changes would also be prudent, especially with respect to the search and browse functions. We expect that the improvements for the search function in particular will have a positive impact, given that the search pages are accessed much more frequently than the browse function and that teachers have commented on specific ways that the search function could be improved.

The results also indicate there is potential to grow the user base. There are at least three reasons for this conclusion. First, there has been a steady increase in users each month, even without strategic marketing to reach out to more teachers. Second, this organic growth of DREAM includes a substantial group of users (35%) who reside outside of Canada, and therefore are not among those who would have received notification the release of DREAM. Finally, there are clear indications that the tool is efficient, satisfying, and useful to users.

How, then, to grow the user base? While evidence has shown that word of mouth and direct linking have been the most effective ways of expanding the DREAM user base, there is merit in considering other sources of traffic. Search traffic from Google and other websites has accounted for a majority of the site sessions to date. By promoting our search results with the use of Google AdWords, and SEO optimization through smart site linking in reputable and related sources, our target audiences would encounter DREAM more often. There are also web-based music forums that may be worth investigating for promotional value. Having active exposure on these forums might increase referrals through direct links as well as word of mouth. At present, Facebook is our sole provider of social media referrals. Facebook contains targeted ads that can be focused on specific demographics. By setting up these targeted profiles, we can ensure that DREAM exposure increases to music teachers, students, and other interested parties.

Edelman (2010) claims that successful digital marketing has four components, two of which have direct application to DREAM. He argues that marketers must first “engage the consumer throughout an increasingly digital purchase journey” (Edelman, 2010, p. 2). This strategy suggests that continuing to grow the user base, without charge, in the ways discussed above. Over time, adding such features as a donate button and creating a premier version might serve to both increase the user base and generate revenue to maintain and enhance DREAM. Edelman (2010) also stresses that successful marketers continually gather and use digital data to guide their actions, and this we will also continue to do with the aim of refining DREAM and making it available to the widest possible audience.

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