musescore
USABILITY REPORT

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Overall, it was found that MuseScore and its interface were well-received by test participants. Of the five participants tested, all five said they believed MuseScore had a good layout and was easy to use. Testers praised the side menu and main toolbar, saying options are "right there" for users. Additionally, the participants liked that "help is easy to find" and "everything is labeled" in case there is confusion with MuseScore.

However, despite this, only three of the five participants stated they would choose MuseScore if given the choice of music notation software. One participant stated, "MuseScore works for the bare minimum, but [more complex software like Finale and Sibaleus] are easier to use and have more features." One area that was especially criticized was the menu bar in the top-left corner. Participants stated that the menu labels were "confusing", and that "too many things are hidden in it." Additionally, some participants found other areas, like the right-click menus, to be "lacking". Even the favored side menu and main toolbar were found to have issues that reduced their usability. The side menu's search bar was described as "hidden" and "not useful", while the main toolbar was found to have "confusing" icons, particularly the "Note Input" icon.

While some areas of the software were more praised than others, all areas of the software had findings that can interfere with the usability of the interface. Thankfully, all these areas can be easily addressed. This report will describe the findings, why they don't work, and how the areas can be fixed.

METHODOLOGY

MuseScore is music notation software that allows users to digitally create music scores and sheet music. Users can utilize MuseScore to compose and arrange custom songs, which can be exported into various formats for distribution or uploaded online for viewing. Because MuseScore is free, open-source, and available for many platforms (including Windows, MacOS, Linux, and mobile devices), it is utilized by many amateur musicians who wish to start composing but can't afford more elaborate software. This usability evaluation was performed on MuseScore to test how user-friendly and navigable its interface is.

TESTING OVERVIEW

Tests were conducted by Brad Schmitz between January 5 and 8, 2018, and occurred both virtually and in-person at Brad's house in Ottawa, OH. During the testing period, five participants were asked to spend a half hour with MuseScore, performing tasks and answering questions about the software. The evaluation included:

- Answering pre-utilization questions about MuseScore and its interface
- Performing real-world tasks with MuseScore while thinking aloud
- Answering questions about their satisfaction with MuseScore and its interface

TEST PARTICIPANTS

To most accurately reflect MuseScore's intended audience, the five participants tested were all teens or young adults who had musical experience. The demographics of the test participants are as follows:

Age	
17	1
18	1
19	1
20	2
TOTAL	5

Education	
High school	2
University (Music major)	2
University (Non-Music major)	1
TOTAL	5

Gender	
Male	2
Female	3
TOTAL	5

Music Software Experience	
Very little, w/ MuseScore	1
Some, w/ MuseScore	3
Some, w/ Finale	1
TOTAL	5

WHAT PARTICIPANTS DID / HOW DATA WAS COLLECTED

As part of the usability evaluation, participants were given 10 seconds to observe and become familiarized with MuseScore's interface. After this time, they were asked the following questions:

- What do you think the purpose of MuseScore is?
- What type of people do you think MuseScore is meant for?
- What information did you gather from the screen? What features do you see?

After the familiarization, participants were asked to complete nine (9) tasks, or real-life scenarios, that involve navigating and utilizing MuseScore. Due to how the tasks built off each other, the participants were given the tasks in order. Participants were asked to try to complete tasks on their own, but could ask for help if they could not figure out how. The following tasks were given to the participants:

- #1: Re-create a short snippet of music, provided to the participant (below), in MuseScore.

- #2: Change the key signature of the music to 3 flats and remove accidentals.

- #3: Transpose the music up a diatonic third using the transpose tool.
- #4: Add accents to all quarter notes and staccato markings to all eighth notes.
- #5: Add a repeat sign to the end of the measure.
- #6: Add a Bb trumpet and baritone saxophone to the score, and copy the information from the other staff into their staves.
- #7: Change the title, composer, and arranger in the score properties.
- #8: Export the song as a PDF.
- #9: Print 10 copies of the song.

For each task, a participant was rated a 0 (did not figure out / gave up), 1 (found with difficulty / after a hint), or 2 (found with no help).

Finally, participants were asked a series of conclusion questions about their experience with MuseScore and its interface. The questions asked were:

- Overall, was MuseScore easy to use? Why or why not?
- Which step was the hardest? Why?
- Which step was the easiest? Why?
- Do you like how MuseScore is laid out? Why or why not?
- If you had to do this again, but could use different software, would you still choose MuseScore? Why or why not?

TESTING LOCATIONS

All participants were tested with the newest version of MuseScore (3.0). During the testing, three participants were tested in-person, and two were tested virtually. The three in-person participants were tested in the kitchen of Brad's house on an HP Envy laptop running Windows 10. The laptop was positioned on a table in front of the participants, with a Blue Yeti microphone plugged in to capture spoken audio. Programs open during the testing included Google Chrome (to demonstrate testing on Wikipedia), MuseScore, and Flashback Express (to record the screen and system audio). A separate laptop was utilized by the moderator to take notes, and was positioned in a way that allowed for the moderator to see both screens without permitting the participant to see what was on the note-taking laptop's screen.

The two virtual sessions were done through a video call in Discord, with screen sharing enabled. Similarly to the in-person sessions, a Blue Yeti microphone was plugged in to capture audio, Flashback Express was used to record the screen, and a separate HP Envy laptop was used to take notes. However, both virtual sessions differed in the way they were administered. During one session, the participant shared their screen with the moderator and navigated the program on their own computer, telling the moderator what actions they were doing. However, one participant could not get MuseScore working on their computer.

Thus, the moderator had to share their screen with the participant, and the participant directed the moderator how to perform the tasks.

RESULTS

	Task #1	Task #2	Task #3	Task #4	Task #5	Task #6	Task #7	Task #8	Task #9
Participant #1	2	2	1	2	2	1	2	2	2
Participant #2	1	1	0	2	2	1	1	2	2
Participant #3	2	2	2	2	2	1	1	2	2
Participant #4	1	2	2	1	2	1	1	2	2
Participant #5	1	1	0	2	2	1	1	2	2

Table 1. Scores each participant received per task. A 2 means the participant completed the task without help, a 1 means the participant completed the task after a hint or excessive hunting, and 0 means the participant could not complete the task or gave up.
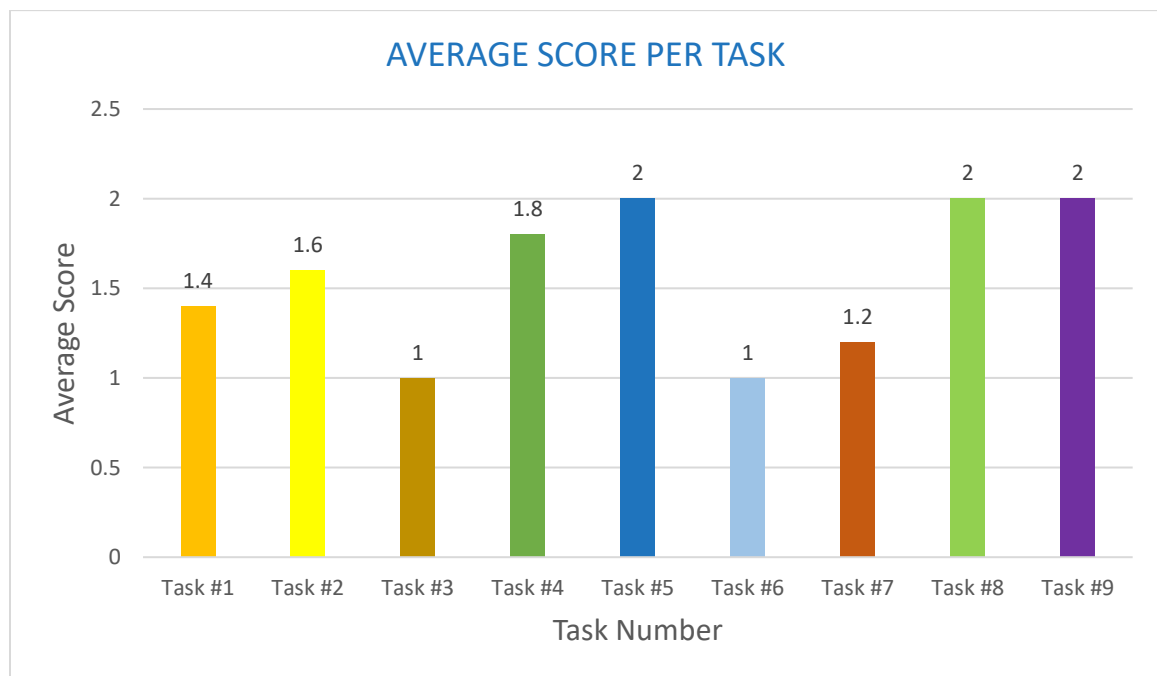

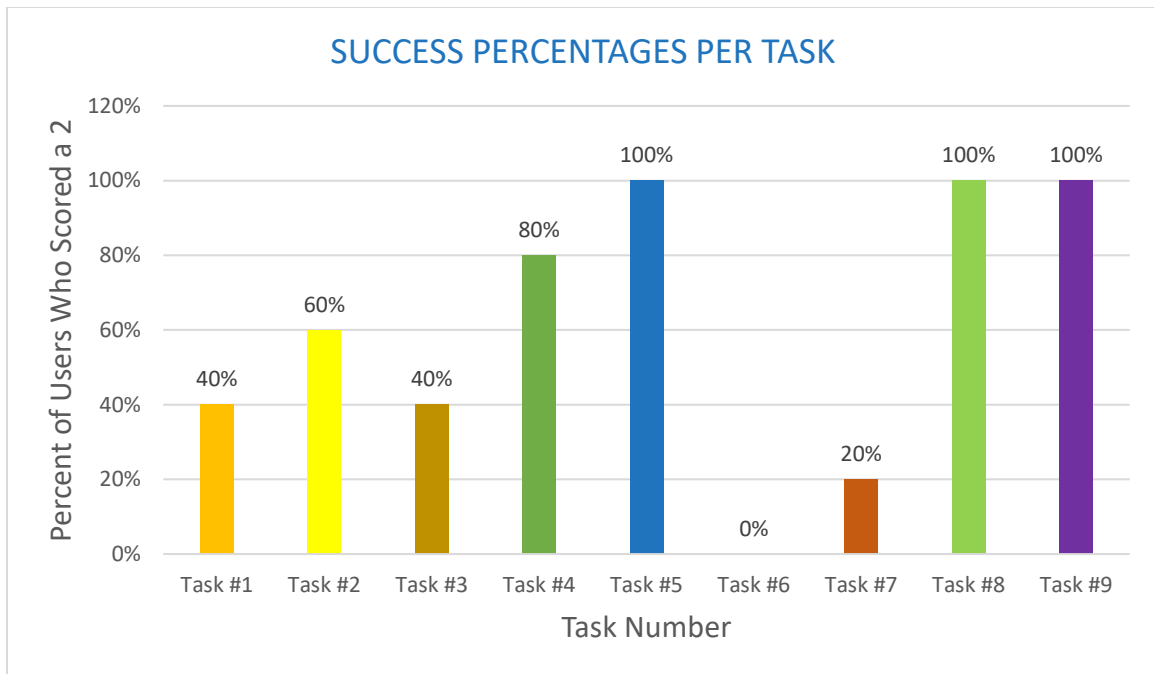*Figure 1. Average score per task.*

Figure 2. Percent of users who completed a task without help (scored a 2) per task. See Table 1 (pg. 6) for information about scoring.

From the data, it can be concluded that Tasks #3 (transposition) and Tasks #6 (adding instruments) were the overall most difficult for the participants. These tasks received the lowest average score of all the tasks, with an average score of 1. Task #7 (changing the score properties) was also seemed to be difficult for participants, receiving an average score of 1.2 (Figure 1). However, Task #6 was the most consistently difficult for participants: no participant received a 2 for that task. For Tasks #3 and #7, at least one participant scored a 2. While Task #3 received a lower average score than Task #7, it also had a higher success rate (Figure 2).

Conversely, Tasks #5 (add a repeat sign), #8 (export), and #9 (print) were the easiest tasks for the participants to perform. All of these tasks received an average score of 2, indicating that all the participants completed the task without help. Additionally, Task #4 (add articulations) received an average score of 1.8 and a success rate of 80%, indicating all but one participant completed the task with no assistance. The participant who did need help also scored a 1, meaning they completed the step after being given a hint (Table 1, Figures 1 and 2).

FINDINGS AND RECOMMENDATIONS

<u>Menu Bar Issues</u>

FINDING #1: Users had trouble finding features in the top menu due to vague labels.

Perhaps the most notable finding that was discovered during the evaluation were the problems with finding options in MuseScore's menu bar (pictured below). Of all the tasks performed, the two with the lowest average score (a tie between Task #3: transposing and Task #6: Adding Instrumnets, both with an average score of 1) were tasks that were located within the menu bar. It's not hard to wonder why: the names of the menu options are vague. For example, how is "Edit" different than "Format", or "Tools" different than "Plugins"? Espeically for newcomers to MuseScore, knowing were certain features are located within the menu bar can be tricky.

File   Edit   View   Add   Format   Tools   Plugins   Help

SUPPORTING EVIDENCE

For example, in Task #6, people were asked to add two instruments to the score. Almost immediately after this instruction, three of the participants went to the "Add" menu option, scanned it for a bit, then began to hunt for the "Instruments" option in the various menu options. Participant #2 was one of these people, and to quote them, "So then I'll hit "Add"... [pause] That doesn't look like what I want... [Pause] Plugins? Nope. Tools? Doesn't look like it. Format?..." After a hint or some of hunting, the participants found how to add the instruments.

However, after performing the tests, a realization was made that the wording of the question may have been misleading. The tasked asked the partipants to "add a Bb trumpet and a baritone saxophone to the song." Since the word "add" is utilized in the question, participants may have been led to believe that changing the instrumentation was in the "Add" menu. A more appropriate wording would be, "change (or edit) the instrumentation of the score so a Bb trumpet and baritone saxophone are also included." Or, it may be a simple beginner's mistake to try to "Add" an instrument – it's hard to tell currently.

RECOMMENDATIONS AND COMMENTS

There are many potential solutions to rectify this. The easiest, however, is to simply rename the menu bar options. For example, rename "Add" to something more descriptive, like "Insert," and "Format" to "Layout." Additionally, some menu options could be shifted around. Options like "Instruments" and "Preferences," which are currently in the "Edit" menu, could be moved to the "Add" and "File/View" menu options, respectively. Or, these options could be given icons on the toolbar for easier location.

Something to note is that Tasks #8 and #9 were both located in the menu bar as well, but received the highest average scores of all the tasks (2). This meant the tasks had no

confusion from any of the participants. While this may seem slightly perplexing, it should be noted that both "Export" and "Print" are located under the "File" menu, which is pretty standard to most software. As stated by Participant #3, "Basically everything's always the same when you print." Users are accustomed to software having a "File → Print" or "File → Export" option, and thus doing this in MuseScore was second nature.

FINDING #2: Some functionalities are hidden with menus instead of being easily visible in the toolbars.

     The menu bar also seems to be very good at hiding complexity, placing lots of options in the top menu. However, this directly breaks the "discoverability" principle in Tog's Principles of Interaction Design. By attempting to hide complexity (features and options), MuseScore has only increased the complexity of finding and utilizing certain features. As stated above, Task #3 and #6 had the lowest average score of all the tasks, most likely because these tasks were hidden in the menu bar.

SUPPORTING EVIDENCE

     This is most prevalent in Task #3, the task where participants were asked to transpose the song up a diatonic third. Of the five participants, four of them had no idea a "Transpose" tool existed in MuseScore, and proceeded to transpose each note manually. Participant #1, after being told there's a "Transpose" tool in MuseScore, said, "There is? Didn't know that." The reasoning behind this is simple: how would people know the tool exists if it's hidden away in a menu? If a "Transpose" option with an appropriate icon was on the main toolbar, it may be much easier for people to see. This is supported by the conclusion questions: of the five participants, three stated that Task #3 was the hardest, due to the fact it wasn't in a good location. As later stated by Participant #1, "I didn't know it was that easy… I always just dragged each note."
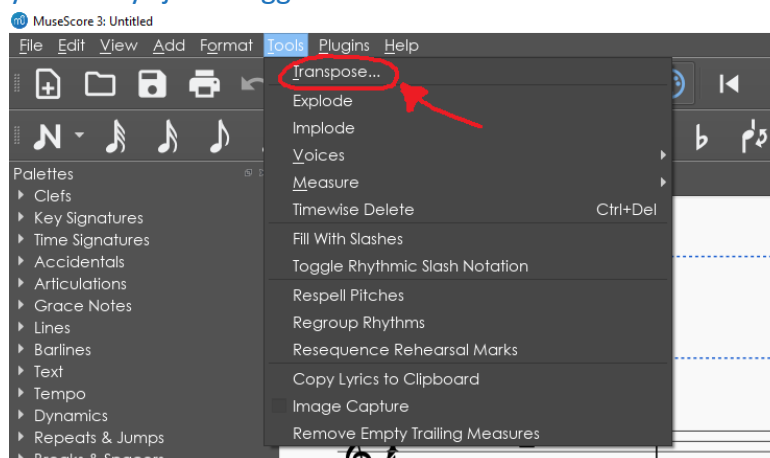
Location of the transpose feature in MuseScore.

RECOMMENDATIONS AND COMMENTS

The simplest solution to this finding is to show the hidden functionalities in a better location, such as the side bar or the main toolbar. After doing the tasks, Participant #2 remarked, "The most difficult was probably adding instruments or transposing… It was difficult because [these options weren't] on the two main bars here (see below), so I was looking for it here and I couldn't find it." Moving some of the menu bar options to the side bar or main toolbar would make them more visible and easier to discover for users, especially newcomers to MuseScore. For example, a gear icon could be added to the main toolbar to allow for easier changing of settings, and a transposition icon (a note being moved to a different place on a staff) could be added to allow for easier access to the Transpose feature.
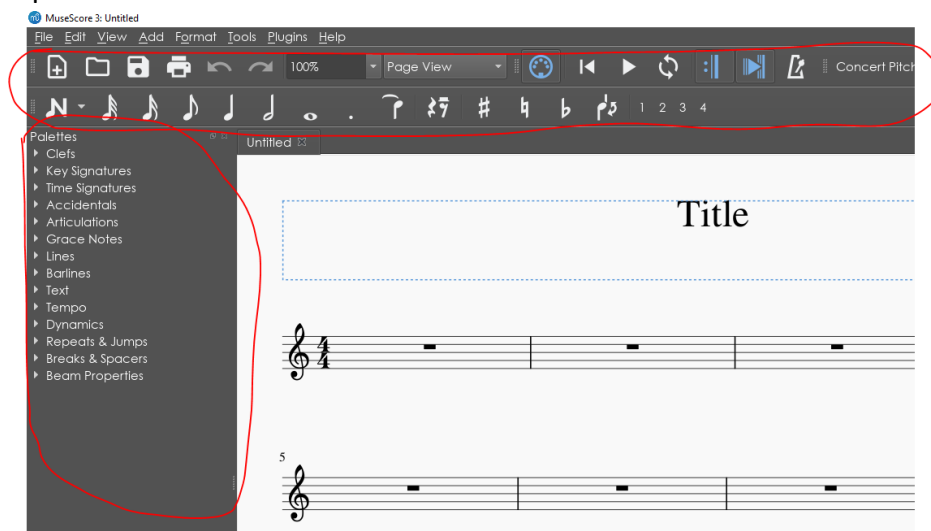

The "two main bars", the main toolbar and the side menu.

Side Menu Issues

FINDING #3: The search bar is in an inconvenient location and only applies to the side menu bar.

When people are stuck with a problem while using software, one of the easiest solutions is to search for help. This is typically accomplished through an online service like Google or a built-in search bar. While MuseScore has a built-in search bar to help users locate tools and features, it isn't particularly useful. This search bar only applies to the side menu (which is arguably the easiest menu to navigate), and is located somewhere most users wouldn't naturally look (see below). In fact, some users might not even be aware this search bar exists at all.
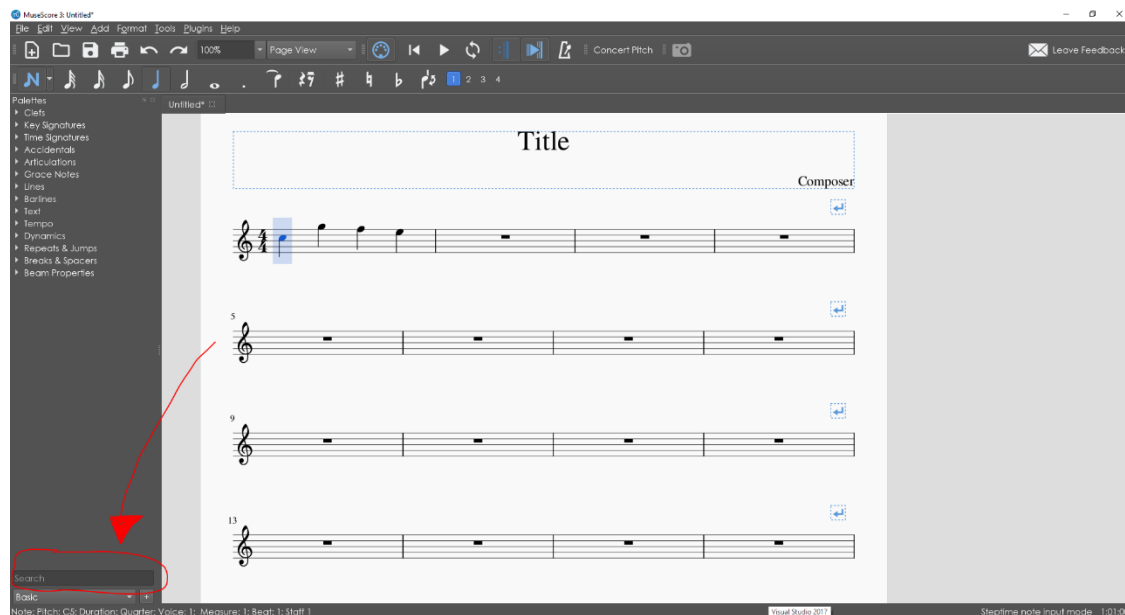
Location of the "search bar" in MuseScore.

SUPPORTING EVIDENCE

    The evidence for this finding is unique: instead of being built on what the users did during the tasks, it relies on what the users DIDN'T do. During the entirety of the testing, the search bar was almost never utilized by the participants. The only instance where it was used was by Participant #4 during Task #6. While hunting, Participant #2 found the search bar, typed "Instruments", then deleted the text when they found nothing. While performing this task, Participant #4 said, "Now I'm clicking search and typing instruments… [pause] That's not what I want." After this task, Participant #4 did not use the search bar again, indicating that they knew the search bar wasn't very helpful since it only applied to the side menu.

RECOMMENDATIONS AND COMMENTS

    There are two main solutions to this problem. The first solution is to remove this search bar, and place one in the top right-hand corner that covers all areas of the software, instead of just the side menu. Such a side bar would be vastly more helpful, giving users easier access to tools and features if their location is unknown. If this solution is not viable, placing the search bar in a better location within the side menu would help it to be found easier. For example, a small version could be placed beside the "Palettes" label, to make it visible and indicate it is for that menu only.

Main Toolbar Issues

**FINDING #4:** Some icons in main toolbar can be confusing or misleading for users.

Many of the participants in the usability test praised the main toolbar for being clearly visible and easily accessible. However, a few of the icons gave users some difficulty in their understanding. Especially for amateur musicians, the purpose of some icons in the main toolbar could be deceiving. While it could be argued that simply using documentation or hovering over the icon (which gives a brief description of the icon, see below) can solve this issue, many users may not know of these help features within MuseScore, especially new users.

Hovering over an icon in the main toolbar gives a short description of what the icon does.

SUPPORTING EVIDENCE

An example of a participant being misled by an icon in the main toolbar was Participant #2 with the repeat sign (the ":||" icon in the top toolbar, circled below). During Task #5, where users were told to make the song repeat with a repeat sign, Participant #2 first went and clicked this icon, saying, "Okay, now we're going to click this… [pause] Uhh, that doesn't do anything." Shortly after, the participant found the repeat sign in the "Barlines" submenu in the side menu. Participant #2 later explained that they thought clicking the repeat sign would make a popup window appear, which would allow him to add repeat signs to the song. In actuality, this menu option toggles whether the repeat signs are used during playback. Because Participant #2 did not know about the hover-over help, they had no idea of what the repeat icon would do.
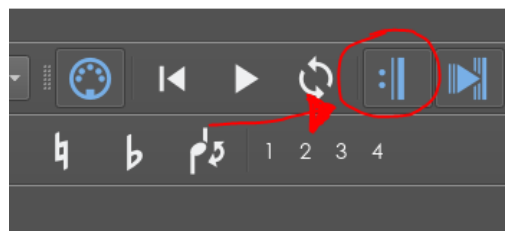
*The "Play repeats" option in the main toolbar.*

RECOMMENDATIONS AND COMMENTS

There are a number of ways in which the icons could be fixed. The first is changing or updating the icons to be more reflective of their purpose; however, this solution may be difficult, seeing as the icons already hint at their purpose. A better idea may be to have the hover-over help show up immediately, instead of after a few seconds. This could help new users to understand the functions of items quicker. A third solution would be to label the different toolbars. For example, in the toolbar pictured above, the word "playback" could be inserted above or under the icons to indicate they are only used when playing back a song.

Main (Score) Screen Issues

FINDING #5: Users had difficulty entering notes into the score.

Undoubtedly, the single most important aspect of music notation software like MuseScore is entering notes digitally; after all, that is the main purpose of music notation software. Thus, it is a bit embarrassing for MuseScore that three of the five participants had some difficulty entering in notes in Task #1. This is all thanks to one button being un-toggled: the note input button (shown below). Without it pressed, participants could not enter notes into the main screen. Many aspects of this button contribute to this, including its location and icon, and thus should be addressed.
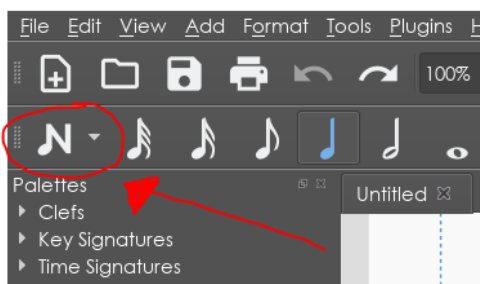
SUPPORTING EVIDENCE

The note input button was only used by the participants during Task #1. However, during this task, only 40% (two out of five) of the participants completed it without help. The other three selected their note duration at the top, tried to input a note, then struggled when the note didn't show up. Participant #4, when doing Task #1, said, "Right at the top, there are different length notes. So I click the 8th note button, and now I click down below… [pause] It didn't do anything. I'll try the space bar maybe…?" This was due to the "Note Input" button was not toggled. However, the "Note Input" button gives no clear indication of its purpose: the icon is a quarter note ($\quarternote$) combined with a capital N. Nothing about this icon tells users about its function, or that toggling it is required to input notes. Additionally, the button is sort of shoved in the top-left corner, nowhere near the main (score) screen where it applies.

RECOMMENDATIONS AND COMMENTS

The fastest change for this issue is to simply alter the "Note Input" icon to make it more reflective of its purpose. Instead of having the icon be a quarter note / capital N mix, it should be changed to something that gives more insight into its function. For example, the icon could be changed into a note pointing towards a staff (something like ♩→☰). This would give users a much better understanding of the button's purpose, as well as point new users towards where to click first.

However, just changing the button may not be the best fix. When "Note Input" is not toggled, clicking the page allows for it to be panned so the user can adjust their field of view. When toggled, clicking causes a note of a selected length to appear at where the user's cursor was hovering. Since note input is such a major component of music notation software like MuseScore, making a larger and more noticeable "mode" viewer would help users to understand which "mode" they are currently in: "Note Input", "Score View", etc. Such a viewer could also help users to easily switch between the different "modes."

FINDING #6: The right-click menu on the main (score) screen lacks many tools that would be useful there.

While menus and toolbars are handy locations for features and tools, the most accessible window is typically the mouse right-click menu. Right-clicking, in most software, opens a small window at the mouse pointer's location that has a variety of options for the user. MuseScore is no different, having two different right-click menus on the main (score) screen: one for when the user is hovering over the staves, and one when the user is hovering over the page (pictured below). While these menus have convenient options like "Copy-Paste" and "Style", they also lack a few important options that the user may want when right-clicking.

The two right-click menus in the main (score) screen. The left picture shows when the mouse is over the page, and the right picture shows when the mouse is over a staff.

SUPPORTING EVIDENCE

A notable example of the right-click menus not having the proper information was during Task #7. While performing this task, some of the participants right-clicked while hovering over the page, hoping that the "Score Properties" window would be in the right-click menu. Participant #3 was one of these participants, and during the post-test questions, they mentioned, "If there was more stuff in the right-click menu, that would be nice… It was only useful for copy-pasting honestly." If tools like the "Transpose" tool or the "Score Properties" tool were located in the right-click menu, they may have been more easily found by participants.

RECOMMENDATIONS AND COMMENTS

The easiest change for this finding is simply to add more tools and features to the right-click menus. As mentioned above, placing options like "Score Properties" and "Instruments" in the page right-click menu, as well as placing options like "Transpose" in the staff right-click menu, could give users quicker and easier access to these tools. Instead of having to hunt for these tools in the menu bar, users could simply right-click and have access to many of MuseScore's features. This doesn't mean the options should be removed from the menu bar; instead, the tools could be located in both the menu bar and right-click menu, giving users a choice of where to access the tools.

Of course, it also must be cautioned that adding too many items to the right-click menu would just add complication to the menu and would confuse users. For example, the staff right-click menu already has 12 options within in. Adding too many tools to this menu (even as many as 5) could cause the menu to get too cluttered, which would overwhelm users. Thus, it may be advised to only add the most-utilized tools that make sense in the menu. To determine which tools are the most-utilized, a separate study will have to be conducted.

CONCLUSION

Overall, while participants found MuseScore's interface to be pleasing and well laid-out, issues were discovered within all areas that can be easily corrected. The four main areas within MuseScore (the menu bar, the side menu, the main toolbar, and the main (score) screen) all have aspects that can make them confusing or overly-complex for users. However, these aspects can all be corrected in various ways, as detailed above. By changing these areas, MuseScore's interface can be improved to make it even more user-friendly for all.