



Effect of keyboard ownership on keyboard performance in a music fundamentals course

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Abstract

This study examined whether requiring undergraduate college nonmusic majors, enrolled in a music fundamentals course, to own a keyboard would enhance their keyboard skills. The course included instruction in reading notation, singing and keyboard skills. There were two groups. One group (experimental) owned keyboards and had them accessible at their homes for practice, while the other group (contact-control) had to check out keyboards for use in the music building. Students' keyboard skills were tested three times. There was no significant difference in keyboard performance data between groups. There was also no significant difference in overall student achievement, which included music reading, singing, rhythm accuracy and keyboard skills. While one might assume that students having ready access to their own keyboard at home would increase the likelihood of practice and therefore enhance their keyboard performance, as well as other music skills, that was not the case in this study.

Key words

achievement, fundamentals, keyboard, music, nonmusic, ownership, performance, skills, training

This study focused on the use of keyboards as part of a course in music fundamentals for undergraduate college students. The course consisted of instruction in basic music concepts of music reading, singing and fundamental keyboard skills for prospective primary school classroom teachers.

The relationship of keyboard accompaniment to singing has been the focus of research, with mixed results. For example, Atterbury (1993) worked with kindergartners for one year in which one group sang with accompaniment and one did not. At the end of the year there was no significant difference between the groups, based on Gordon's *Primary Measures of Music Audiation* (1986). Conversely, another, older study (Hale, 1977), which directly examined the effect of accompaniment on singing of kindergartners, demonstrated that children accompanied by piano with melody and harmony sang songs more accurately than those who were in a number of other conditions. While the current study did not focus on the effects of accompaniment, I thought that it might be useful for pre-service primary school teachers to develop some basic music accompaniment skills.

Given that the participants in the present study had little or no background in music, the content of group keyboard instruction, as well as the other music skills and knowledge taught, was basic. The bulk of group instruction that researchers have studied has focused on collegiate-level students who were typically enrolled in class piano. In the 1980s, group piano instruction was considered an area that had been neglected, especially as it pertained to teaching of piano majors and training teachers for group instruction (Shockley, 1982). In the 1970s, we do find some general articles in *Clavier* that pertain to group instruction in secondary schools (Pardue, 1978) and private studios (Almlie, 1979).

The current study examined the effect of keyboard ownership on piano performance and other musical skills of college undergraduate nonmusic majors. In a research study that was reported in two parts, Costa-Giomi (1999a, 1999b) compared an experimental group of children who were provided with keyboards and lessons to a control group that had no formal music instruction. After three years, she found no differences between the experimental and control groups on math or language achievement (1999a), cognitive or music abilities, motor proficiency, self-esteem or academic achievement (1999b). There was a positive effect on school music marks (1999a) because there was a decline in the control group's music marks, while those of the keyboard group remained stable. The National Piano Foundation, a member of the Music Industry Council, funded this research.

The previously mentioned areas of interest are tangentially related to the current study; however, there appears to be no research that has investigated whether ready access to keyboards enhances student keyboard skills. The music industry has encouraged keyboard ownership for a number of reasons. In a discussion with a corporate educational representative regarding the possibility of setting up a purchase and return program similar to those available for textbooks, the representative assumed that the students' keyboard skills would be enhanced, as did I. The logic was simple. If students had keyboards available where they lived, they would be more likely to practice than if they had to go to a music building and check out keyboards for use in that building.

For the purpose of this study I compared the keyboard skills of students who owned their own keyboards to those who did not. All students were enrolled in the same course and received the same course content from the same teachers using the same model keyboards.

Method

This study examined whether requiring undergraduate college nonmusic majors ($N = 92$), enrolled in a music fundamentals course, to own a keyboard would enhance their keyboard skills. There was an experimental group ($n = 52$) composed of four intact classes ($n = 15, 12, 12, 13$) who purchased keyboards, and a control group ($n = 40$) also composed of four intact classes ($n = 15, 9, 7, 9$) who did not purchase keyboards. The content included basic notation reading, singing and keyboard skills. The course and examinations started with singing simple songs learned in class using note names, clapping basic rhythms while verbalizing a modified Kodály mnemonic system, and locating individual pitches from the learned song on the keyboard. The final goal was for students to sing a self-taught song with an array of rhythmic values while accompanying themselves on the keyboard.

Two teachers each had two course sections of each group across two terms, all of which were taught using the same material and tested in the same way. Students in four sections used keyboards provided in class that were also available for a two-hour checkout in the music building (contact-control group), while students in the other four sections were required to own and bring their keyboards to class daily (experimental group). Thus, the

instruction and instructors (each teaching two sections of each group) were the same for the two groups. The only difference between the groups was that the experimental group owned keyboards and had them accessible at their homes for practice, while the contact-control group used the identical keyboards in class and had them available to check out for use in the music building if they wanted to practice outside of class.

Throughout the term there were three competency tests covering rhythm, singing and keyboard skills. Students' keyboard skills tested during the competency examinations varied. The first and second competencies required students to locate pitches on the keyboard for songs that had been taught in class. Then the students had to find the correct pitches on the keyboard for a song they had not previously seen. For the last competency test, students sang and accompanied themselves on one of several songs taught in class, after which they performed the chords of a self-prepared song followed by singing the same self-prepared song while accompanying themselves. The accompaniment consisted of playing and changing either triads or one-finger chords (student choice) in synchrony with their singing the melody.

Rubrics were developed for each of the three performing tests. The rubrics for the first and second competency scored students on a 0–5 scale for the correct keyboard pitches on one of several songs learned in class and on a specially composed unknown song, for a possible total of 10 points per competency. The third competency rubric included 34 points related to keyboard performance. Students earned up to 20 points for singing a self-accompanied keyboard performance on one of several songs learned in class, up to six points for playing chords of a self-prepared song, and up to eight points for singing and accompanying themselves on the same self-prepared song. Thus the maximum score students could receive for keyboard-related performances in the course was 54 points.

Reliability was established by having both teachers score 40 percent of each other's students on the competency tests. For the keyboard-related portions of the competencies, the teachers rated the students within one increment on the seven rubric scales – correct pitches for the learned song and composed song on the first and second competencies, performing a learned song with accompaniment, playing the chords alone, accompanying themselves on a self-taught song – 97% of the time (260 of 268 scores).

Results

A *t*-test analysis comparing overall points earned in the course for students who did not purchase keyboards ($M = 92.9$, $SD = 5.28$) with those who did ($M = 93.9$, $SD = 5.14$) yielded no significant difference, $t(90) = 0.83$, $p = .41$.

Keyboard performance data were examined separately by means of a two-way ANOVA, with teacher and group (keyboard ownership) each being used as independent two-level factors. There was no significant difference between teachers, $(F(1, 88) = 1.88, p = .17)$ or groups, $(F(1, 88) = 2.48, p = .12)$. There was also no significant interaction between teachers and terms, $(F(1, 88) = 0.36, p = .85)$. The means for students with and without keyboards for teacher A were 51.8 ($SD = 2.42$) and 50.9 ($SD = 4.57$), respectively, and 50.7 ($SD = 3.78$) and 49.5 ($SD = 3.25$), respectively, for teacher B. While not significant, students who did not own keyboards scored slightly lower overall than those who did, for both teachers. The total course minimum and maximum keyboard-related performance scores ranged from 38.8 to a perfect 54.0.

Discussion

While we might assume that students having ready access to their own keyboard at home would increase the likelihood of practice and therefore enhance their performance skills, this was not found in the present study. Performance skills assessed here were not better for students with keyboards; however, there are no data to indicate whether students who purchased keyboards took advantage of the opportunity to practice more than those who did not own keyboards.

Another point that needs to be made is that the course in this study had components other than keyboard instruction, with the focus being across many aspects of music (46 of 100 points not related to keyboard skills). Also, the keyboard skills used here were the most basic: finding pitches and simple accompaniment (mostly using the one-finger chord function built into the keyboards).

Great care was taken in establishing the rubrics and their reliability, so that there could be confidence in the scoring of the keyboard skills assessed. However, given that these were the most fundamental of skills, it might be that had the course been focused on higher-level keyboard skills, including performing melody and harmony on the keyboards, there would have been differences between the groups. Clearly, the mere fact that one owns an instrument does not mean that one will practice it. There were no specific keyboard practice homework assignments given, with the exception of the final self-prepared song, which could have been practiced independently in class.

Given the results of this study, the only thing that can be said with confidence about the impact of owning a keyboard, even when in a class requiring performance, is that it does not necessarily enhance keyboard skills. It seems optimistic to think that if students have the means readily available to perform better, such as personal access to a keyboard, they would take advantage of it without specific required assignments. However, that was not the case in this study. Performance differences might have emerged between the students who did and did not own keyboards had additional keyboard homework assignments been required. Indeed, this probably points to the need to establish specific contingencies if we want our students to practice, rather than assume, or hope, that students will practice out of a personal desire to be better.

The customary caveats remain. These were intact groups (classes), rather than having been created through random assignments, and there was no pre-test, both of which could have helped assure equivalency at the outset. However, there is nothing in the data to indicate that there were disparities between the musical or keyboard abilities of students in the different groups. Indeed at the beginning of the class, students with musical experience are encouraged to take a simple test that allows them to exempt the course.

Designing and implementing curricular changes should follow the model characterized by the 'experimenting teacher' (Madsen & Yarbrough, 2002). These teachers follow the competency-based educational process of 'keeping records, specifying the learning task, systematic teaching, and evaluating of both the product and process' (p. 96). All too often, we change curricula based on what seems like a good idea, well educated though it might be. We must not neglect the need to be systematic in implementing a curriculum and in examining its effectiveness, even if what we implemented seemed to make sense when we did it. Sometimes that which appears logical is not correct. In the instance of this curriculum study, it made sense that requiring students to possess keyboards would result in better keyboard skills. It did not. With rare exceptions, curriculum changes are reasonable and intuitive, but assessment and reconsideration are less common. This study found that assessment and reconsideration were essential, because the assumptions that went into

changes in this curriculum were incorrect. The good news is that we now know we were wrong in our supposition, rather than, in the absence of data, thinking that because it sounds like a good idea, it really is one.

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Abstracts

L'effet de l'appropriation du clavier sur l'interprétation comme principe élémentaire d'un cours de musique

Cette étude s'interroge si l'appropriation d'un clavier augmenterait les compétences pianistiques des étudiants non-musiciens universitaires inscrits dans un cours pour apprendre les principes de base de la technique du clavier. Le cours comprend l'enseignement de la notation musicale, le chant, et les bases du piano. Il y avait deux