



Aural Model & Tempo Control in Technology-Assisted Practice: Effect of Apps on Student Achievement

Rachel D. Hahn, PhD, NCTM
University of Missouri

ABSTRACT

The purpose of this study was to explore the effects of technology-assisted aural modeling and tempo control during practice on students' performance and self-reported practice behaviors. Participants were non-pianist music majors ($N=43$) enrolled in level 1 or level 3 of collegiate group piano. Technology was implemented regularly in participant coursework and research treatment sessions were held during weeks 5 and 10 of the semester. Participants were randomly assigned to one of four treatment groups and asked to practice an unfamiliar solo repertoire piece using a metronome (tempo control group), YouTube app (aural model group), Tempo SlowMo app (tempo control and aural model combination group) or without technology (control group). Students recorded a pre-test sight-reading performance and a post-test final performance so that achievement could be assessed. Pre-test and post-test surveys were used to gather data regarding student preferences for technology and practice behaviors.

CONTACT

Rachel D. Hahn, PhD, NCTM
Assistant Adjunct Professor
of Piano Pedagogy
University of Missouri
rdm6y5@mail.missouri.edu

INTRODUCTION

Technology-assisted practice has become increasingly prevalent in music education over the past several decades. Numerous types of technology, including computer software, mobile device apps, and MIDI keyboard tools have been widely used in music education and piano pedagogy, but little is known about the impact of technology on practice, pedagogy, and curriculum (Crowe & Rio, 2005).

METHOD

- Music majors enrolled in group piano ($N=43$).
- There were two treatment sessions, at weeks 5 and 10 of the semester.
- The students:
 - Recorded a sight-reading performance of an unfamiliar solo repertoire piece at the start of each treatment session.
 - Practiced with their assigned technology (control, metronome, YouTube, or Tempo SlowMo) for 13.5 minutes.
 - Recorded a final performance of the piece.
 - Completed pre-test and post-test surveys to report their practice behaviors, perceptions of technology, and demographic information.
- Sight-reading and final performance recordings are currently being analyzed by expert judges using a multidimensional assessment rubric (Ciorba & Smith, 2009).

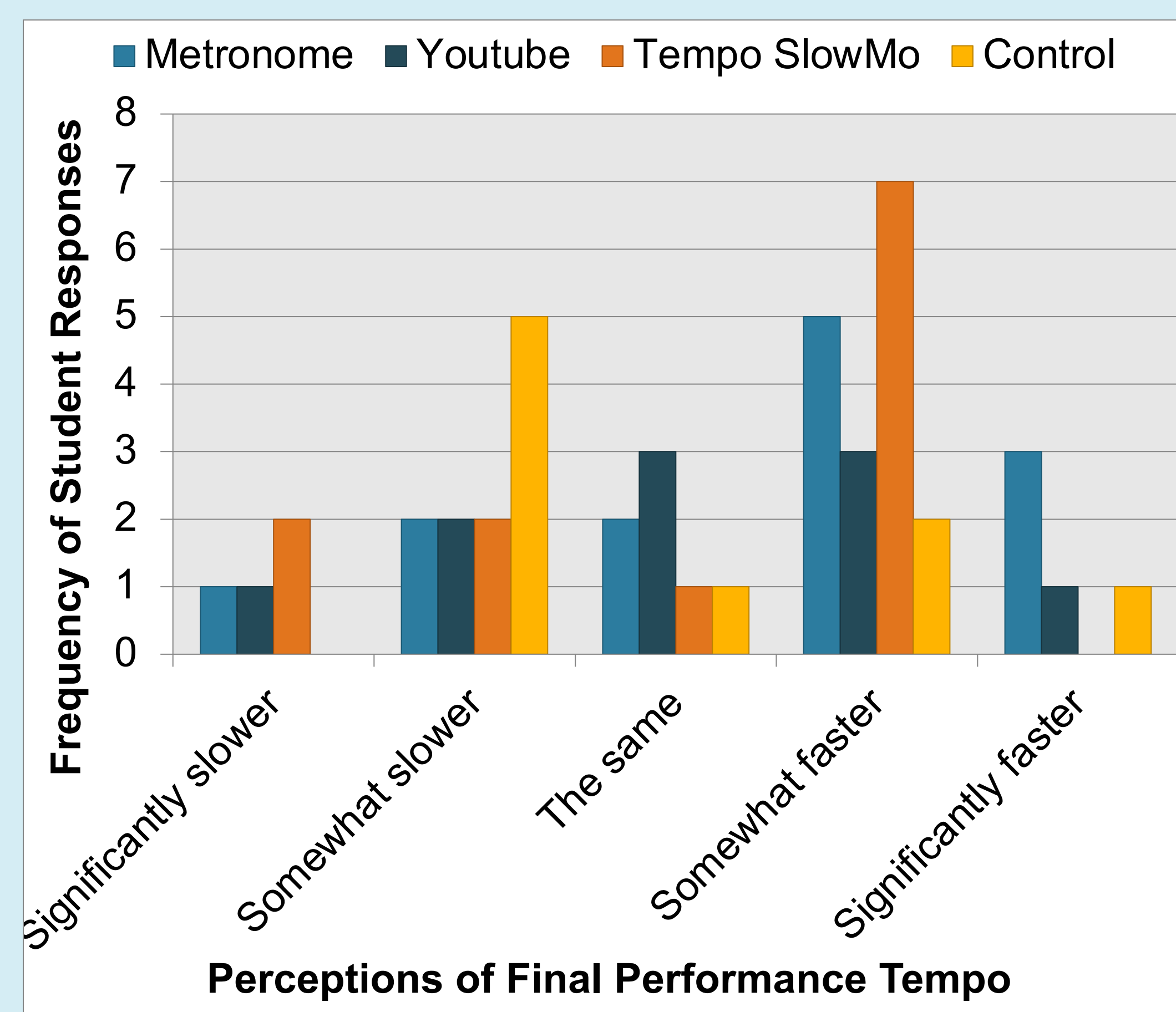


Chart 1. Student responses: "describe the tempo of your final performance compared to the suggested performance tempo of the piece."

TECHNOLOGY TOOLS



Table 1. Self-Reported Student Practice Behaviors (adapted from Miksza, 2006).

Self-Reported Practice Behaviors		
Singing/whistling	Silent fingering	Hands separate
Frustration	Varying dynamics	Marks part
Self-guiding	Varying articulation	Blocking
Repeat section, measure, or piece	Whole-part-whole	Trace hand position changes
Slowing/Quickening	Informal	Alter rhythms

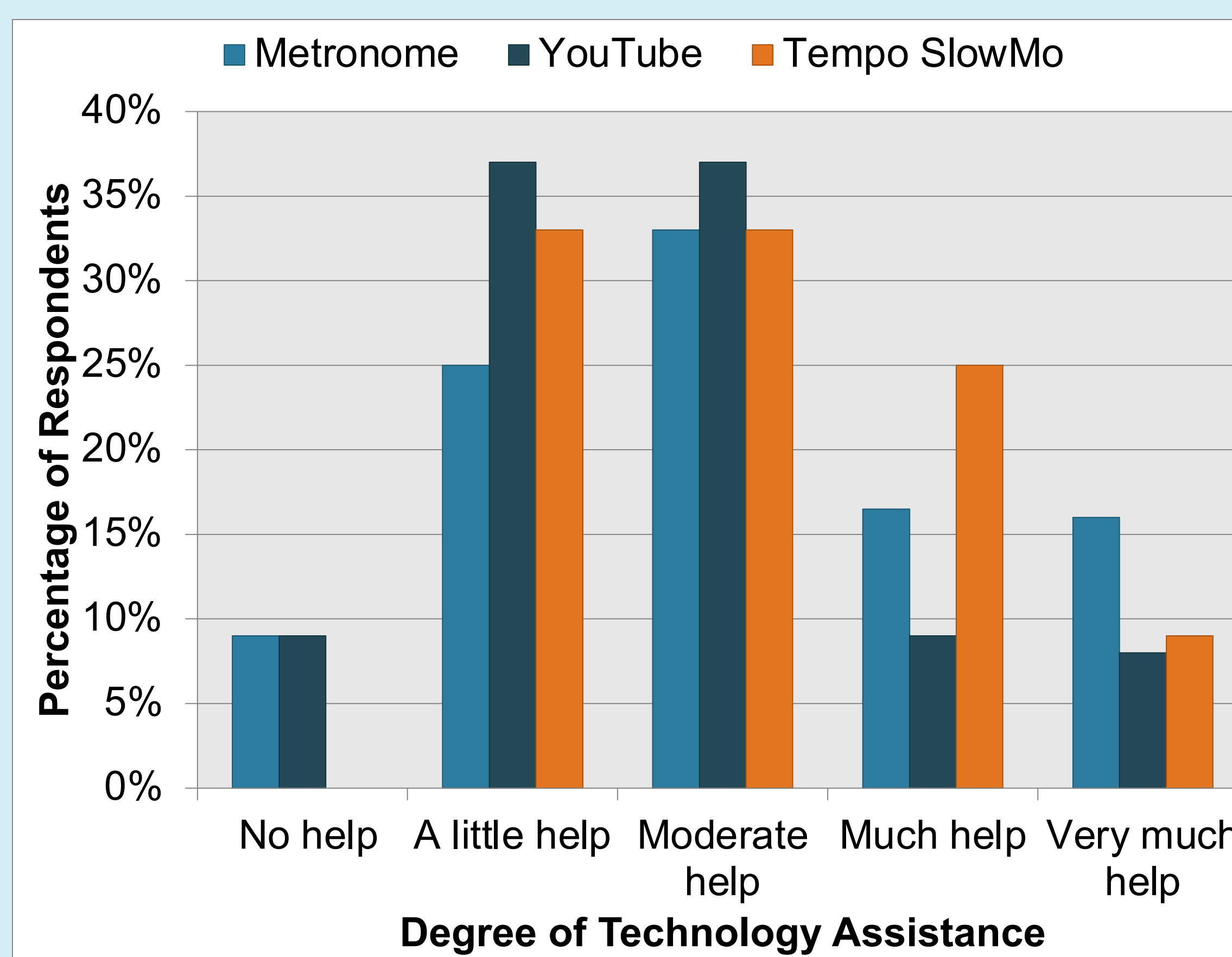


Chart 2. Student responses: "how much did the assigned tool help you practice?"

RESULTS

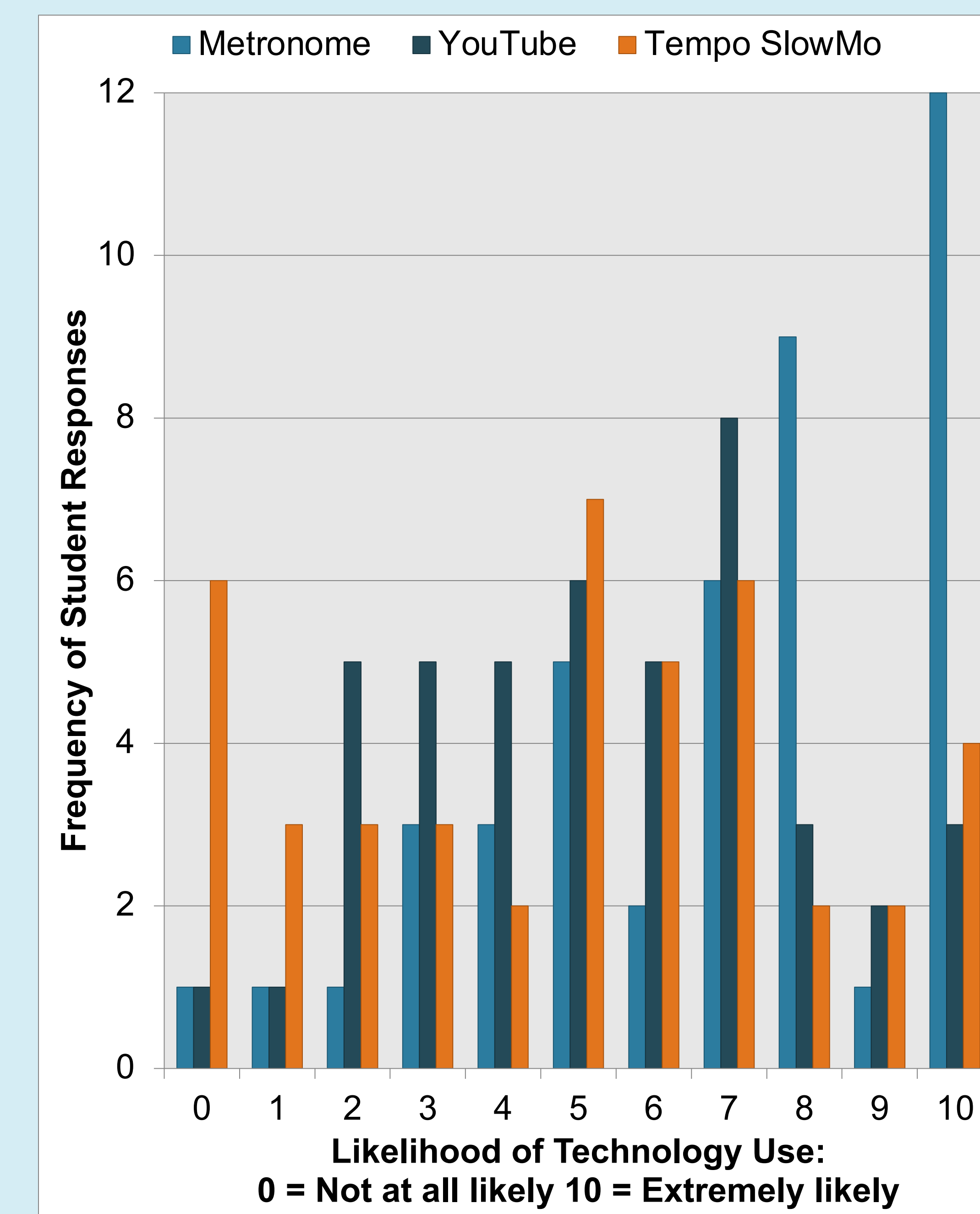


Chart 3. Student responses: "after today, how likely are you to use these technology tools in your future practice?"

STUDENT RESPONSES

- On average, students reported spending 36% of their technology practice time with no clear goal in mind and 64% of the time with a clear goal in mind.
- Participant comments about practicing with technology included:
 - I think generally that the simpler the technology the better.
 - The metronome should be a guide to the rhythm. Eventually, you shouldn't need it to play.
 - YouTube is a useful tool if used correctly, but it has several limitations, mostly stemming from the fact that you have little to no control over what you are listening to, and cannot manipulate it.
 - Practicing with Tempo SlowMo helped me realize my mistakes faster and helped me with the style of the piece.
 - Technology is a very useful guide, do not overlook it.

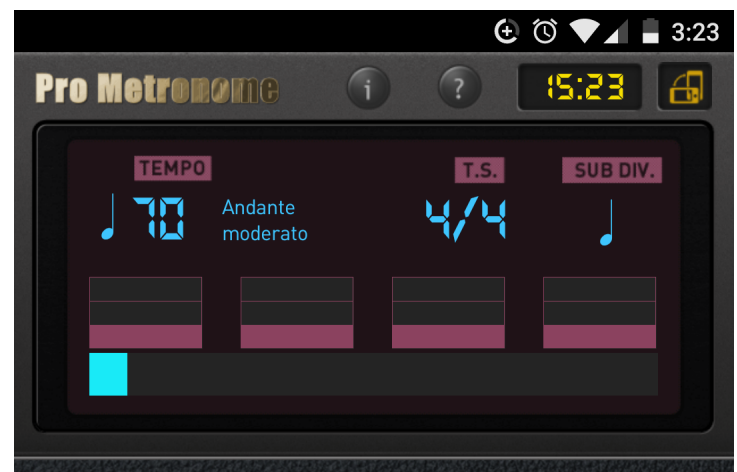


The Frances Clark Center: Research Webinar

Reaching Digital Native Music Majors: Pedagogy for
Undergraduate Group Piano in the 21st Century
The Frances Clark Center for Keyboard Pedagogy
January 2021

Abstract/Description

Rapid changes in technology have encouraged music educators to use new and in some cases untested tools in many classroom contexts to cater to today's digital native students. The purpose of this study was to explore the effects of technology-assisted aural modeling and tempo control during practice on students' performance achievement and self-reported practice behaviors. Participants were non-pianist music majors ($N=43$) enrolled in level 1 or level 3 of collegiate group piano. Technology was implemented regularly in participant coursework and research treatment sessions were held during weeks 5 and 10 of the semester. Participants were randomly assigned to one of four treatment groups and asked to practice an unfamiliar solo repertoire piece using a metronome (tempo control group), YouTube app (aural model group), Tempo SlowMo app (tempo control and aural model combination group), or without technology (control group). Students recorded a pre-test sight-reading performance and a post-test final performance so that achievement could be assessed. Pre-test and post-test surveys were used to gather data regarding student preferences for technology and practice behaviors. No significant differences were found between technology groups in terms of performance achievement, practice habits, or performance growth. However, subsequent analyses found that background experience variables (including level 1 or level 3 status) did have a significant impact on students' group piano behaviors and success during treatment. Considering the importance of effective technology implementation, and the impact of facilitating deliberate practice in music education settings, these results may provide insights for independent or classroom music teachers. Findings may also transfer to students of different ages and developmental levels.



Rachel D. Hahn, PhD, NCTM - Assistant Adjunct Professor of Piano Pedagogy
University of Missouri - rdm6y5@umsystem.edu

REACHING DIGITAL NATIVE MUSIC MAJORS:
PEDAGOGY FOR UNDERGRADUATE GROUP PIANO IN THE 21ST CENTURY

Rachel D. Hahn, PhD, NCTM

ABSTRACT

This dissertation comprises three projects that were designed to contribute to our understanding of today's digital native music majors and their needs within the group piano curriculum. The first investigation is a review of literature pertaining to collegiate group piano, describing existing research and recommending aspects still needing to be studied. The second investigation used phenomenological qualitative methods to investigate the adaptation processes of group piano students as they adjust to the new demands of collegiate music study. Data from participants ($N = 6$) indicated that despite individual differences, common themes of Preparedness, Motivation, Priorities and Expectations, Support Systems, and Accomplishment/Empowerment were characteristic of the group piano experience for these first-semester students. The third investigation is an experimental study. I sought to determine how the use of technological tools with varied capabilities of providing aural modeling and tempo control features affected collegiate group piano students' achievement. Group piano music majors ($N = 43$) were randomly assigned to one of four treatment groups (control, metronome, YouTube, or Tempo SlowMo). No significant achievement differences were found among the technology groups. Results from these three projects indicated that (a) there is a need for further research in group piano contexts, (b) group piano is a valuable part of the music core curriculum because courses are conducive to 21st-century skill development and (c) individual differences are important considerations when assisting students with adaptation processes and technology selection in group piano.

***Full dissertation available on ProQuest Dissertations and Theses**