Impact of Music on Cognitive Performance

Bryan Maas¹, Seth Schober¹, Pedro Vallejo-Ramirez¹
¹University of Rochester

Introduction
The influence of music on cognition and learning has long been a topic of study. Music genre, volume, and frequency are common factors in these studies, and there seems to be a multitude of conflicting opinions on what is most beneficial for learning. Some have argued that outside stimuli can only serve as a distraction (Furnham & Bradley 1997); they argue music impairs learning and can be correlated with diminishing scores in the student population. Others (Cockerton, Moore, Norman 1997) suggest that music is actually beneficial to cognitive performance. In this study however, we seek to understand how different music genres can affect peer-to-peer learning.

Motivation and Methodology
Students often listen to music to relax and counter the stress and pressure caused by academics; they often claim to use it to focus in punctual tasks, namely blocking out background noise. We performed three case studies from existing research that explore different ways in which music affects cognitive performance. Our primary motivation is to gain insights on how music affects cognitive performance of students in Universities, and more specifically in a peer-to-peer learning environment.

Impact of Music Genre and Volume
Hypotheses: Preferred music genres increase concentration
Overall, cognitive performance is highest with no music.
Instrumental classical music is best for performing academic tasks.

Figure 1. Group 1 Case Study: Preferred music genre in the peer-to-peer learning environment.

As expected, the studies showed that students performed best in silence and worst in loud conditions. Interestingly enough, there was no direct correlation between genre and scores; volume is an essential factor in the impact of music on cognitive performance.

Effect of Music on Student Collaboration
Workshop attendance and participation occurs when students feel they have something to gain. Active collaboration is the purpose of the workshop environment.

Figure 2. Group 2 Case Study: Preferred music genre in the peer-to-peer learning environment.

With background music, Students felt they worked together more. By reducing the “awkward silence” in a group setting, students feel more comfortable expressing their views and exploring solutions.

Conclusions
Considering our approach was qualitative, and our sample size was small, we gained truly valuable insights on the effect of music in the workshop atmosphere.
• The first case study showed that volume has a negative effect on cognitive performance in college students.
• The second case study showed that students are more likely to voice their opinions in a collaborative environment with background music.
• The third study

Music Stimulation in the Brain
The measurements of the scatter from IOLs followed a systematic procedure for every sample analyzed. The Scatterometer for High Dynamic Range of Power Measurements (SHDR-PM) was custom built to measure the forward and back scattering pattern from IOLs as a function of incident laser beam angle using a 633 nm laser source.