

The Role of Music in the Pursuit of Knowledge

Everyone has been impacted by music in some form. The most obvious of these impacts might be a favorite song, maybe because it has a really catchy bass line that you just can't get out of your head, or maybe because the lyrics sound like they were written about a period in your own life. Maybe the connection to music goes even deeper. I had a friend in high school who came from an entire family of musicians, and music was their culture. I remember distinctly the matriarch of the family holding her one-month-old grandson, gently bouncing him on her arm "in a perfect eighth-note pattern, so he'll have great rhythm when he grows up."

Music helps people. It brings them together. It can form entire communities around an artist, an album, or even just a song. But there are also more subtle impacts of music that aren't so easy to see or recognize. Philosophers all across the world and in all stages of history have pondered the idea of "the pursuit of knowledge," trying to explain what knowledge is, and how we can gain and achieve it. Many methods are widely discussed and even accepted, from the Socratic method of inquiry, to Jerome Bruner's elements of narrative. However, there is a less common tool in furthering individual knowledge: music. Music plays an underappreciated yet valuable role in the pursuit of knowledge. When used correctly, it can actually prime us for learning, putting us in the right frame of mind to both seek and accept knowledge. Music can have specific effects such as boosted memory and increased motivation, allowing students to achieve and retain knowledge easier and faster than they otherwise would. This occurs through both physical and psychological mechanisms, from the neural pathways in our brains to simply a more positive shift in our mood.

When it comes to learning, music is able to prepare us and prime us in a way that nothing else can. According to research by the Royal Conservatory of Music in Toronto, any kind of

musical participation, whether it is the active role of playing an instrument or the passive act of listening to a song, actually stimulates several different regions of the brain. This wide range of stimulation in the brain leads to a process known as neuroplasticity, which the Conservatory defines as “the brain’s ability to reorganize itself by forming new neural connections” (The Benefits of Music Education).

It is important to note here that for these purposes, the term “experience” is given a somewhat restricting definition. It refers to specific, individual events or actions that have a clear beginning and end, such as riding a bike or solving a math problem. Every experience we have impacts our neural pathways and connections in some way. Simply put, new experiences form new pathways and connections, and repetition of these experiences strengthens these pathways (Archon). An easy way to understand this concept is the idea of habits. A habit, as defined by the New Oxford American Dictionary, is “a settled or regular tendency or practice . . . an automatic reaction to a specific situation.” Since a habit is “regular,” or repeated, this neural pathway is used frequently within the brain, strengthening the pathway and making it easier for the brain to do it over time, so easy that it becomes “an automatic reaction.” The first time someone rides a bike, a new neural pathway is forged in their brain. The more they practice, the more that pathway is used, strengthening it until they are able to easily ride a bike without a second thought.

Relating this back to neuroplasticity, if a person has higher levels of this process occurring in their brain, as musicians generally do, they are therefore able to form these new connections easier and faster. This in turn means that these new experiences, even something like learning a new concept in Calculus, will come easier to those who have some kind of musical background, be it playing or merely listening, than those who do not. The easier and sooner these

neural pathways are established, the easier they are to strengthen. This means that, in theory, a musician would be able to master a new concept and make it into a sort of habit with less practice and repetition compared with their nonmusical peers. This directly links participation in music, be it active or passive, to faster and easier learning of new concepts for the average person. Musical experiences lead to an increased ability to learn and a higher ability to recall information later, by forging and strengthening new neural pathways. Additionally, the fact that it can be any kind of participation in music makes it easy and accessible for nearly everyone. All of this means that even just listening to music often enough can actually make it easier to learn new things and further achieve knowledge.

Dr. Anne Fabiny of Harvard University goes into more depth on this topic, specifically how it relates to memory, in her article about social worker Dan Cohen, who studied the effects of music on memory in the context of elderly citizens with dementia. Essentially, Cohen played these people songs they told him they used to listen to, and, as Fabiny put it, “the music seemed to open doors to the residents’ memory vaults.” These people who suffered from a memory disorder began to sing and dance to the music as if they had never stopped listening to it. Some of the patients said they could even remember specific instances of hearing that song, in terms of both time and location. Fabiny explains that participation in music “reactivates areas of the brain associated with memory, reasoning, speech, emotion, and reward,” and explains that it “doesn’t just help us retrieve stored memories, it also helps us lay down new ones” (Fabiny).

These are astounding findings in support of music in the educational context. Since music is able to boost memory by allowing people to remember past instances of hearing the song, even those with a memory disorder such as dementia, it stands to reason that the same effect could come from studying. Let’s suppose someone is studying chemistry while listening to music, and

as they're reviewing the varying strengths of intermolecular forces, Mariah Carey's "All I Want For Christmas is You" is blasting in their ears. Following along with the results unveiled by Cohen's study, if this person were to play this same song in their head during the chemistry exam, the region of their brain dealing with memory would be activated, and they would likely be able to remember listening to that song while studying. This may even go far enough to help them remember some of the concept they were studying at the time. Most readers, upon reading the title of that song, likely even heard the song start playing in their head, singing along with the lyrics, despite reading only the title. This is a perfect illustration of the relationship between music and memory. All in all though, the power of music to boost a person's memory in any capacity can be incredibly useful in retaining information and details, allowing them to both acquire and keep knowledge they might not otherwise be able to access.

In a piece for PBS, Cheri Lucas writes about the relationship between music, memory, and learning. She states that even the idea of getting a song stuck in your head, something everyone has endured at some point in their life, is evidence "that music is easily ingrained in our memory." This means that music can be used in the educational setting to help with both learning material and being able to recall it later. The article consults Chris Brewer, who is a speaker and trainer for using arts, such as music, in the educational and medical settings. Brewer explains that music can "evoke emotions" and "helps [students] focus more clearly on the task at hand and puts them in a better mood for learning." Continuing on with this idea, she explains that different kinds of music are better for different occasions. For instance, upbeat lyrical music can often motivate learning, especially when those lyrics "encourage positive thinking." By contrast, instrumental music, that is, music without any lyrics, can help encourage concentration, and is optimal for more mentally taxing activities, such as reading or writing (Lucas).

Brewer explains how different kinds of music can result in different mental and emotional effects on the person listening, leading to, on average, higher ability and performance in different areas, such as learning or studying. Following along with the idea of neuroplasticity and neural pathways, Brewer's ideas expand on making that learning easier, but this time in the psychological sense. Whether it's through increased concentration or a more positive mindset with regards to the learning itself, Brewer says, music is able to increase our ability to work and learn. This means that, by understanding the effects of different kinds of music on our motivation, focus, and concentration, we can actually increase our productivity through the use of music. For instance, a student listening to nonlyrical music while studying will likely have increased focus and concentration, allowing them to work harder and get more done, furthering their own knowledge. Similarly, if a student listens to a playlist of their favorite songs as they walk to their, say, 8 AM organic chemistry lecture, they will likely be in a better mood walking into the lecture than they otherwise would have been. This boost in their mood and increase in positive thinking is able to prime them, making them more receptive to learning and more focused on the task ahead of them.

The theory of knowledge emotions in modern psychology further expands upon this idea. The Noba Project, a program dedicated to free psychology education, describes the phenomenon of knowledge emotions, defined as "a family of emotional states that foster learning, exploring, and reflecting." Essentially, these are emotions that make us more open and willing to learn and accept new kinds of knowledge. One of the most noteworthy of these emotions is the feeling of awe, which is defined as being essentially a vast feeling of wonder that often results in motivation. This feeling is often recognizable by the sensation of chills or goosebumps, and is usually encountered in nature and the arts.

This aforementioned motivation is key. As Paul Silvia describes it in his article for the Noba Project, “awe motivates people to engage with something outside the ordinary . . . When people see beautiful and striking color images of supernovas, black holes, and planetary nebulas, they usually report feelings of awe and wonder. These feelings then motivate them to learn about what they are seeing.” Silvia also explains that music is one common way to experience the feeling of awe, namely through “a wide frequency range,” or changes in pitch, and “major dynamic shifts,” or changes in volume (Silvia).

So, while this may depend on the kind of music a person plays or listens to regularly (as most pop songs, for instance, don’t tend to have the same frequency and dynamic contrast as, say, classical pieces), it is still a powerful piece of research in favor of music. Silvia shows here that any musical piece that is diverse and lively enough to inspire the player or listener with a feeling of awe is likely also enough to inspire them to learn and be more open to new experiences. In this way, participating in music in some form can actually make someone more open and willing to learning, thereby leading to more success in gaining this new knowledge.

It is important to note here as well that all people are different, so what fills someone with wonder and awe can be entirely from person to person. My grandfather adored classical music, and he had accumulated an entire arsenal of CDs and records throughout his lifetime as a result of that infatuation. For me, classical music always seemed to put me to sleep. I’ve always been a fan of more upbeat pop songs, and for a purely instrumental musician, such as myself, that feeling of awe is often generated by impressive vocal feats, something like Ariana Grande hitting that high note in her song “Dangerous Woman,” rather than something like the dynamic contrast in Tchaikovsky’s “Symphony No. 4 in F minor.” Listening to someone like Grande would

motivate me to do something like, say, write a 6 to 8 page research paper, while all Tchaikovsky would motivate me to do is catch up on my sleep.

In his book *Thinking, Fast and Slow*, Daniel Kahneman explains the idea of priming, describing that certain feelings, emotions, words, etc. can influence us in ways we aren't even conscious of (Kahneman 53). This idea fits well in the context of music. Through knowledge emotions, emotional influences, neural pathways, and memory effects, music is able to "prime" us for learning. We probably aren't aware of it, but music makes us more likely to retain information, helps us recall it faster, and can even increase our motivation, focus, and concentration. This is exactly the kind of "priming" that Kahneman is referring to. This shows just how important and powerful music could be. As Kahneman explains, this idea of priming isn't just an idea or a hypothesis of some kind. It is an actual explanation of how our brain and subconscious works. Therefore, music's ability to prime us when it comes to learning is proof that there are real effects and real results of this method. All of this music a valuable tool for seeking, achieving, and retaining knowledge.

But while music has been proven time and time again and by a multitude of studies to be a diverse tool for aiding learning, it still isn't treated as one on the large scale. Particularly in public schools, music and music education is being severely drawn back or even cut altogether. Students are finding it harder to participate in the school band or choir because of reduced funding and supplies, or even due to scheduling conflicts that result from music being low priority. In my own experience, I attempted to sign up for a specific music class for my senior year of high school, but I was told that it was scheduled at the same time as AP Physics, which I was also registered to take. My guidance counselor told me I had to choose, along with everyone

else who was signed up for both. She then couldn't understand why I was frustrated about not being able to take both.

When we consider all of the good that music does for everyone, student or not, this whole situation seems incredibly backwards. The benefits of music are continuing to emerge and solidify, and yet access to it in the academic context seems to be dwindling. Music is much more than a hobby, it's a powerful academic tool. It is for this reason that students especially should never have to choose between music and something else. The fact of the matter, though, is that they do have to choose. So, what do we do?

Music is too powerful a tool to lose. It is because of this that the next step is to share this information, so that it can be used to allow us to reach our full potential. Music is often underestimated, or disregarded as just a hobby or a pastime, but it is so much more than that. When used correctly, music can be a powerful academic tool, helping to advance both human and individual knowledge.

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