

Editorial

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Driving on a highway to hell I found the stairway to heaven. A mentorship lecture intermixed with rock music and a quiz

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Introduction

Twenty years ago, if you were attending a boring lecture, you would see half of the audience sleeping and some snoring to the roof. The relieved final claps of those still awake would rouse most of the napping attendees, except for the occasional deep sleeper who stayed behind, even after the whole audience departed. These days, almost nobody sleeps, even at the most boring of the boring lectures. Five minutes into the lecture, half of the audience plays with either a computer or a smartphone. After all, you cannot accuse somebody who is responding to emails, as they will claim emergencies and deadlines. Those are often legitimate reasons, although playing games or texting is generally not. But who would know!

Nevertheless, we always wondered how we can keep people away from their smartphones and focus their attention on the lecture. We recently experimented with a hybrid approach: the lecture mixes the transmitted knowledge with music and a quiz, which comes with a small reward for the winners. In fact, this approach could disguise a lecture as being a form of entertainment! But can it work without trivializing the intended message?

Here, we present the principle of our musical lecture strategy and its apparent “success” as a pilot presentation at a summer school that included undergraduate and graduate students. Obviously, this design cannot work for all occasions and themes, but elements can often be incorporated to make any type of lecture more engaging.

The science of music

Most of our lab members, collaborators and students enjoy listening to music – if everyone in our office space or lab took off their headphones and played their music aloud, we would hear a cacophony of very different genres and artists. History has it that a myriad of great scientists

were avid music lovers and accomplished performers, including Einstein, Plank, Heisenberg and others, who played violin, guitar and piano. The 1967 Nobel laureate in Chemistry Manfred Eigen (1927–2019) tried for years to persuade the Max Planck Society to create a research center for music and biophysics. Beethoven famously proclaimed that music is a higher revelation than philosophy.

However, listening to music is not just a pleasurable exercise. Song lyrics often have deep meanings and can be used as effective educational resources. In fact, many songs have lyrics written by Nobel laureates in literature. Rabindranath Tagore, an Indian poet and songwriter, received the Prize in 1913. The great Greek music composer Mikis Theodorakis transformed works of one Chilean and two Greek Nobel laureates in literature [Pablo Neruda (1971), Giorgos Seferis (1963), Odysseas Elytis (1972)] into very popular songs. More recently, the American singer/songwriter Bob Dylan received the 2016 Nobel Prize for literature (<https://www.nobelprize.org/prizes/lists/all-nobel-prizes/>).

Music is perceived starting with the external ear. After travelling to the inner ear, the sound waves are transformed into electrical pulses that are transmitted through nerves to the brain for interpretation [1]. Research has shown that this process can release powerful “feel-good” chemicals such as dopamine, making the listener feel happy. In fact, music is interpreted by the same neural systems as other pleasurable and reward responses including those related to sex, good food and addictive drugs [2].

More recently, some researchers have harnessed the positive effects of music on the brain to develop some potential treatments for diseases such as anxiety, depression and insomnia [3–6]. However, even simply listening to pleasurable music has been shown to provide relief for people with mental illness as well as chronic health conditions, memory loss and neurological conditions [7–10]. Consequently, there is a growing branch of science called musical therapy which posits that music can be used to improve clients’ quality of life. It is widely used across a variety of settings including schools, hospitals,

long-term care/rehabilitation centers, prisons and shelters with positive results [11]. The 2-month-old grandson of one of the authors (EPD) is in regular attendance at a formal music listening gathering for infants and he is responding very positively! Many people also enjoy listening to music while exercising as it elevates mood, reduces boredom and increases stamina by distracting from pain, thereby improving physical performance [12, 13].

The game

Our presentation incorporates mentorship messages and music with a two-part game and a quiz, to deliver powerful messages related to personal and professional success.

The video and other details of this presentation can be found at <http://sites.utoronto.ca/acdclab/videos/2019-mentorship-summer-school.html>.

The rules of the game are explained in detail, with an example, in the presentation. The competition starts by displaying a one- or two-sentence mentorship message which includes, in a different color/font, the title of a popular song from the 1960s to 1990s (classic rock era). Here is an example: “Don’t be so hard on yourself. TAKE IT EASY” (a popular song by The Eagles).

In the first part of the game, players have 12 s to write down the artist’s name based on the title of the song incorporated into the mentorship message on this scorecard (Supplementary Table 1). If participants do not guess correctly, a 30-s clip of the music video of the song is subsequently played to give them a hint and another try at

Table 1: Mentorship quotes and songs.

Mentorship quotes	Artists
1 Many of us are chronic worriers. A remedy is DON’T WORRY, BE HAPPY	Bobby McFerrin
2 You must accept that in this life YOU CAN’T ALWAYS GET WHAT YOU WANT	The Rolling Stones
3 Successful people often do their best work UNDER PRESSURE	Queen/David Bowie
4 Everybody wants to reach the top, but who wants to work for it? IT’S A LONG WAY TO THE TOP	ACDC
5 Asking for HELP is not a sign of weakness	The Beatles
6 According to Darwin, the strong survive and the weak do not. I WILL SURVIVE	Gloria Gaynor
7 Life is a jungle and STAYIN’ ALIVE is not always easy	The Bee Gees
8 Most gossip has an element of truth but always evaluate it critically. I HEARD IT THROUGH THE GRAPEVINE	Credence Clearwater Revival
9 Make as many friends as you can and avoid making enemies. YOU’VE GOT A FRIEND	James Taylor
10 Don’t be so hard on yourself. TAKE IT EASY	The Eagles
11 It is okay to be uncertain. Keep looking, keep fighting, keep hoping because one day you will find what you are looking for. I STILL HAVEN’T FOUND WHAT I’M LOOKING FOR	U2
12 Stay humble; you are not as important as you may think. You are JUST ANOTHER BRICK IN THE WALL	Pink Floyd
13 If you believe in it, anything is possible. I AM A BELIEVER	The Monkees
14 Imagination is more important than knowledge (Einstein) IMAGINE	John Lennon
15 Nothing should make you PARANOID; stay calm at all times	Black Sabbath
16 When I am exhausted and out of gas, I need someone/something to START ME UP; find this someone/something!	The Rolling Stones
17 You can take care of today’s business, but DON’T STOP (thinking about tomorrow)	Fleetwood Mac
18 If you are doing something you love, LIFE IS A HIGHWAY. If you aren’t, life is a side street (a pain!)	Tom Cochrane
19 Accept criticism and admit to your mistakes- but do not make the same mistakes over and over OOPS! I DID IT AGAIN	Britney Spears
20 If you learn from your mistakes YOU WON’T GET FOOLED AGAIN by the same people	The Who
21 Show respect to those who deserve it. RESPECT is earned, not given	Aretha Franklin
22 If you choose to STAND BY ME, I will also stand by you, when you need me	Ben E. King
23 The HIGHWAY TO HELL can sometimes lead you to the STAIRWAY TO HEAVEN	ACDC and Led Zeppelin
24 If you accept your mishaps, it will be easier to cope. LET IT BE	The Beatles
25 The answers to your questions may be BLOWING IN THE WIND; look for them!	Bob Dylan
26 In life, nothing is BLACK OR WHITE	Michael Jackson
27 Always stay away from a FOXEY LADY and a Foxey-er gentleman	Jimi Hendrix
28 Life is full of devils. Never show any SYMPATHY FOR THE DEVIL	The Rolling Stones
29 I’m too young. I ought to live it up PAPA DON’T PREACH (I do not need it)	Madonna
30 If I GIVE A LITTLE BIT to you, you can give a little back and pay it forward (be generous)	Supertramp

Note that multiple artists usually perform the same song and there may be more than one correct answer. The titles of the songs are in capital letters.

identifying the artist. The scorecard also invites participants to rate the quality of the mentorship message from a scale of 1–10.

In our particular version, we incorporated 30 mentorship messages to comply with a 1 hour total duration, including answer checking at the end. Table 1 summarizes the mentorship quotes and the answers. However, this format can be easily extended and/or modified to fit the intended need.

Summer school presentation

We showcased this presentation for the first time at the 8th World Hellenic Biomedical Association Summer School, which took place in Oitylo, Mani, Greece, between May 17 and 24, 2019. Attendance was not compulsory, but almost all students (about 60) and faculty (about 30) attended. The students were split equally between undergraduates, graduates and medical students, competing in teams of three. The game itself took about 30 minutes to complete. The presenters carefully observed the reactions of the audiences. A few observations are worth mentioning.

1. No attendee slept during the show.
2. No attendee checked their phone or played with a computer.
3. As most songs were well known, the audience started singing and some even danced to the rhythms.
4. All mentorship messages were displayed as a table at the end, to consolidate the main messages.

Subsequent comments from the attendees suggested that this presentation was one of the highlights of the summer school.

Winners

The winning team was composed of three students (Figure 1) who were honored in the ancient Greek tradition of being crowned with olive branches to symbolize their triumph. The leader also received a laser pointer engraved with the logo of EPD's lab (ACDC Lab; Advanced Center for the Detection of Cancer). Finally, the winning mentorship message was "driving on a highway to hell I found the stairway to heaven" which paraphrases the ancient Greek saying «Ουδεν κακον αμιγες καλου» which means "there is no bad situation which does not contain a grain of good."



Figure 1: The winning team of students, with their olive branch crowns.

From left to right: Dr. Steven Boyages (President of the World Hellenic Biomedical Association), Dr. Georgios Polychronidis, students Christina Niavi and Ioanna Mitrakou and Dr. Eleftherios P. Diamandis (co-creator of the mentorship lecture).

Concluding remarks

Preparing the presentation required considerable time and necessitated a close collaboration between the authors. It seems that the primary objective of delivering powerful mentorship messages in an entertaining way – through music – has been achieved. It remains to be seen if more diverse messages could be delivered in a way that keeps the audience focused on the presentation and not on their smartphones. However, we fully recognize and will never underestimate the power of the smartphones to steal audiences during academic, social and other activities.

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