



A Pilot Study to Determine if Playing Music Before Class Enhanced the “Zoom” Online Learning Environment in a Preclinical Science Course

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Abstract

The COVID-19 pandemic forced students and educators to shift from the traditional physical classrooms (face to face) to online platforms such as the Zoom to host live synchronous sessions. Although this video teleconferencing software facilitated communication between students and faculty around the world, technically the blank, silenced log-in screens removed the “connectedness” of the classroom. A medical educator plays music during the pre-class Zoom synchronous session as an approach to encourage a positive learning environment in a preclinical science course.

Keywords Learning environment · Student engagement · Music · Zoom fatigue

Background

“If Music be the Food of Love, Play on; Give Me Excess of it...” Shakespeare, Twelfth Night

In 2020, students worldwide transitioned from face-to-face classes to online learning due to the close contact risk associated with the COVID-19 pandemic. Many institutions utilized Zoom to support teaching and learning. Students and faculty join the Zoom meetings at a scheduled time for synchronous online classes. A common best practice for faculty to ensure the meetings are managed well included opening the meeting link at least 15 to 30 min prior to the scheduled lecture start time. The early arrival of the host allowed for triaging of technical difficulties. This pedagogical design not only provided academic technological support, but also simulated the “start-up” period seen during in-person classes. (Prior to the pandemic, the “start-up” period before the in-person class sessions facilitated the creation of a positive learning environment. This time usually allowed students to converse with each other or even the teaching faculty of that day and faculty shared session expectations.)

During the fall 2020 semester, an undergraduate pre-medical human physiology course used the Zoom platform for live synchronous online classes. Class meetings were scheduled for 60-to-90-min periods with an additional 15-to-30-min period for sign-ins. This sign-in period on Zoom was the period prior to the commencement of instruction during the scheduled teaching session. The live sessions were scheduled for content delivery in two iterations – a morning and an evening session – based on the AST time zone. While there was a total of 211 students registered for the course during that semester, the data for this pilot study was sampled from the “morning” class’s sessions. The number of students who attended the live synchronous online sessions in the morning ranged from a minimum of 170 students to a maximum of 206 students. The average number of students who attended the morning sessions was 186 students. The data indicated that student attendance in the morning session ranged from 81 to 98% of the total cohort of students registered for the course.

The teaching faculty were trained to present their live synchronous sessions using key principles for online pedagogy. This included ensuring students observe the online etiquette for Zoom class sessions. Only authenticated students were permitted to join the Zoom session. Students who were registered to attend that specific course meeting link connected into the Zoom meetings with the following settings:

The video feature was selected as “turn off video”

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The audio feature was selected as “microphones muted”.

The chat feature was initially set to “communicate with everyone”

However, even though students were able to chat publicly during the sign-in period, this feature was deactivated to “communicate with host only” at the start of teaching.

Although they were able to chat with each other most of the students avoided chatting with other students unless called upon by name. Additionally, during this sign-in time, students were also non-responsive to icebreaker greetings.

Although the practices demonstrated were common courtesy rules for online classes, the hosting faculty reported that the silent periods during the sign-in periods prior to teaching were always “uncomfortable” and “awkward.”

Classes continued in a similar pattern for the following four weeks until the end of the first module. At this juncture, after the first module examination, students in academic peril within the course were invited to meet with the course director for one-on-one academic advising meetings. Approximately, 43 students attended those advising meetings. They represented 20% of the total class size. During those meetings, verbal student feedback on issues affecting academic performance was elicited. Some students reported having to cope with internal challenges such as depression, anxiety, and loneliness. Other students reported having to cope with external challenges such as distracting learning environments, employment/unemployment issues, community racial tensions and the infection or death of loved ones due to COVID-19.

Based on the student feedback, the goal of the course director was to implement a pedagogical tool that would improve the student–student and student–teacher engagement in the synchronous online sessions to create a more positive learning environment. The host faculty for each session were encouraged to play specially selected music during the “sign-on” time – prior to the start of every live synchronous Zoom class session. They were encouraged to note any positive trends.

The aim of the study was to record the responses of the students to that practice and document other observations with regard to changes within the learning environment.

Activity

How to Play Music on Zoom?

The premedical science course consisted of both online asynchronous and synchronous sessions for the delivery of course content. The students were required to attend their online classes via ZOOM meeting (a cloud-based video

teleconferencing software program). Students had direct registered access to the Zoom tool since meeting links were embedded into the course learning platform – Sakai. Students and teachers connected virtually and securely for the “live” sessions at pre-determined times indicated according to the course schedule.

The host faculty had the capabilities of screen sharing both audio and visual information immediately after logging into the Zoom meeting link. This permissions feature enabled the “host” the option to select and stream music to all participants logged into the class session.

The host selected the screen share tab at the bottom of the screen. The advanced tab at the top of the screen share window opened the option to select music or computer sound only. By clicking the share screen setting, the computer’s audio, the host sound was broadcasted to all persons in the main room in the meeting link.

What Type of Music was Selected?

Research literature suggested that listening to music has many functions, benefits, and uses. Music can either calm or arouse the senses [1]. Music transmits information about culture [2]. Music can incite or dissuade ideas, perspective, or information [3].

Determining the appropriate music was crucial. Although the response to music is subjective, the selection of music needed to be more than just a personal preference. Considering the functions of music identified, it was imperative that the music set the right tone for the learning environment.

Therefore, the musical preludes were selected based on the following criteria:

- Solfeggio frequencies – Music of specific tones were helpful with healing and may provide both emotional and physical relief [4]. The findings published by Joseph [5] suggest that the role of sound was important in the management of stress and disorders such as mood, anxiety, panic, and even post-traumatic stress disorder.
- Lyric-less or instrumental – All of the musical selections were instrumental, like the “on hold/elevator” music. The absence of lyrics ensures the learning environment is free of bias. Neutral music reduced the risk of communicating perspectives that may promote personal beliefs or be misinterpreted.
- Diverse culturally – The selections were not dependent entirely on the hosts’ personal taste. The host faculty was encouraged to choose musical selections catalogued from around the world. This decision was geared to acknowledge the range of differences within the classroom. Some examples were from Japanese Gagaku music, Buddhist singing bowls tones, America instrumental pop, Afro-beat and Caribbean Soca music. The variety of selections establishes

an environment of inclusion aimed at removing negative perceptions and embracing differences.

Selecting the musical track was only this first dilemma. The other equally important task was to select and play songs legally. The musical selections were retrieved from various public domain playlists, e.g., the YouTube audio library. These sites were subscription-free, easily accessible with no copyright infringement.

Results and Discussion

What Were Some of the Student Responses to the Trend?

More Students Logged into the Online Meeting Link Earlier

Best practice for faculty moderation of Zoom calls requires that the meeting links are opened at least 5 to 30 min prior to the start of the scheduled class presentation. Link opening time, and student sign-on or attendance was monitored and collated from the Zoom meeting reports. A random selection of six class meetings before and six class meetings after the intervention was done. The student attendance and duration of time in meeting were monitored for each of these sessions. The first six sessions were classes when the faculty logged into the meeting at least 5 to 20 min prior to the start of class. No music was played during these first six sessions. During sessions 7 to 12, the faculty logged in at least 10 to 30 min prior to the scheduled start. Music was played during the pre-class intervals in these sessions. The percentage of students that signed into the meeting link during the pre-class time was tabulated. The average percentage of students that signed-in early in the first six sessions was 27%, while the average percentage of students that signed-in early in the last six sessions was 57%. Twice as many students logged in

earlier into the sessions after the introduction of the musical prelude. The data presented in Fig. 1 compares the percentage of students that logged into the pre-class session before the intervention (sessions 1 to 6) and after the intervention (sessions 7 to 12). There was an overall increase in the percentage of students that logged into the pre-class session after the intervention as compared to before.

Students Made Positive Comments About the Learning Environment

Student feedback was documented from two sources. The first source was from private direct message chat comments from the student to the host faculty or public chat comments made by students to their peers. Although the host was able to see the name of the student, the comments made in the chat tool feature were recorded with student identity withheld. The comments were documented during three consecutive class sessions after the music was first introduced. On average only 5% of students present in the session made private comments to the host about the music being played prior to the class session.

The second source was from student feedback retrieved from the end of semester course evaluation survey. Approximately 69% of the cohort (148 students) responded to the fall 2020 course evaluation survey. Again, less than 5% of the students mentioned the effects of the musical interlude. These comments from the course evaluation that mentioned the playing of the music in the classroom were also documented with student identity withheld.

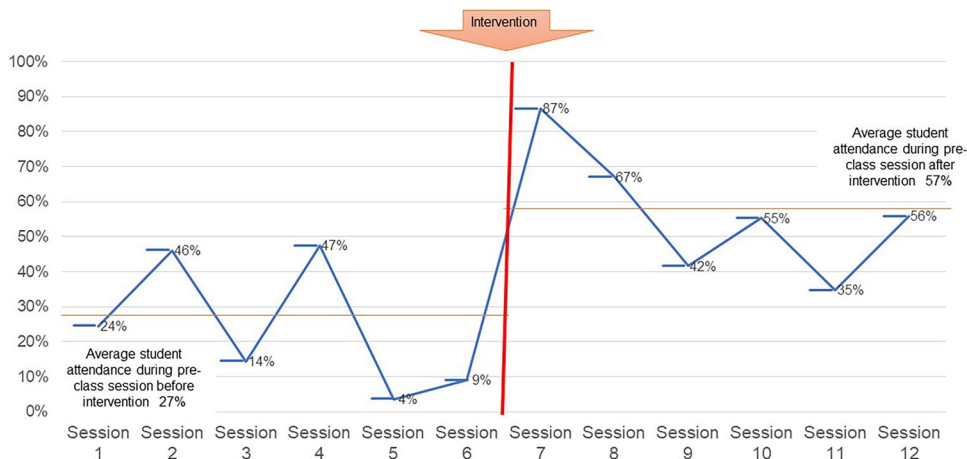
Some of the student comments were:

“The music before class helps to create a relaxing mood”

“I was stressed today – now I am ready to learn”

“I log into class early – just to catch the music segment”

Fig. 1 Music in the classroom: Average student attendance in the online morning pre-class session before and after the musical intervention



“This Christmas music reminds me of home”

Students from various parts of the world were able to identify if the music selection of the day was a traditional beat associated with “their country.” For example, the student whose grandparents were from Brazil was able to recognize the “Bosa nova beats.”

There was dialogue between faculty and student, as well as amongst students in the Zoom chat about non-academic ideas during the pre-session time. The comments encouraged clarification about culture, diversity, and non-traditional medicine in the context of the musical selections. A few students were also brave enough to turn on their videos to demonstrate a few dance moves with their pets.

Based on Review of the Current Literature, What Changes are Most Likely Expected When Playing Music Before the Start of Class in This Particular (Zoom) Online Learning Environment? Were Any of These Changes Observed in the Classroom in this Study?

Muzak – the Ambient Sounds of Elevator Music

The carefully curated selections of ambient music synonymous with the elevator, doctor’s office, waiting room, and lobbies designed specifically as background music are known generically as Muzak. Introduced in the 1900s, Muzak was created to boost productivity. Studies showed that background music increased “individuals’ positive evaluation of the environment, facilitate approach behavior, and enhance pleasure and dominance emotions”[6]. In fact, many scholars suggest that music evolved primarily for the promotion of self-awareness, social relatedness and arousal and mood regulation [7].

Understanding the role of music defined why the intervention of playing music in the classroom was an important component to successfully engage students, create inclusivity and can be considered why music is a key component in online education, promote wellness and build professionalism in academia.

Student Engagement

During pre-session of the live synchronous sessions prior to the intervention, students were greeted with a blank screen and silence. After the intervention, students were greeted with lofty beats instead. A review of the Zoom chat log after the intervention showed that many of the statements typed into the chat box during this period were related to the music playing in the background. Students directed their comments to both faculty and peer if the music was familiar or it was upbeat. Although the topics discussed began

with the musical selection, it evolved on occasion to include other activities. These topics included things to cope with stress, personal reflections of their COVID-19 experience and coping with the online learning environment. Playing music prior to the start of class appeared to be an icebreaker which may create an initial student engagement in an online learning environment.

Diversity and Inclusiveness in the Classroom

The zoom meeting reports for the pre-session also included topics such as student location, culture, traditional practices, and again mental health. For example:

“When a Bossa nova beat was selected, one student related this selection to his childhood memories of spending time with his grandfather from Brazil”

Discussions in the classroom on culture should have created a learning environment that favored diversity and celebrated individual differences. It was during this time many students realized they were in the same country or shared similar cultural beliefs after being able to identify with cultural aspects of the musical selections. Those conversations may have created interpersonal connections which would have improved student–student and teacher-student rapport. The ability of the students and faculty to relate with each other was essential in creating a sense of community or a feeling of “oneness” within the class.

Health and Wellness

Studies show that when music is used in the background – for example as in the service environment – it will help to create a positive mood and activate the emotion regulation process [6]. Listening to music has been shown to reduce social stress and temper aggression in others [7]. The use of music that consisted of frequencies identified as Solfeggio sounds may have been stress reducing [8]. There was no instrument used to measure the physiological changes in mood associated with stress reduction amongst the Zoom classroom participants. However, the musical interlude provided an opportunity for all participants to share a collective moment of wellbeing and temporary escapism. The association of the music with nostalgic elements like “home for Christmas” suggests that the musical interlude was a pleasant experience.

Professionalism

From the technical perspective, the teaching/host faculty appeared prepared, tech savvy, and as such, professionally competent. The Zoom meeting reports showed that the average number of students who attended the morning class was

186. This data suggests that the average student attendance at the morning session was 88%. The host faculty usually started the meeting link at least 15 min before the start “lecture time” as part of the institution protocol for hosting online Zoom synchronous classroom sessions. Figure 1 shows that on average over half of the cohort, fifty-seven percent (57%) of the students were signed into the link during this 15-min period. The early logins and pre-class music segments resulted in both faculty and student punctuality. Student observation of faculty attendance/presence and punctuality was an important teaching tool for professionalism by modelling professional behavior [9].

Conclusion

Music broke the ice when played before the start of the Zoom class sessions in a premedical science course. The musical prelude before the start of class was a great pedagogical tool [10]. The online learning environment was transformed from a silent blank Zoom login screen into an interactive one. The musical interlude implemented by the hosting faculty was the scaffold for interactions for teaching and learning. It fostered a sense of community within the class during a time when students were physically distanced and prone to feeling isolated and lonely.

The intervention improved the emotional and mental state of both students and faculty. The choice of music and informal discussions promoted diversity, equity, and inclusion in the classroom. However, most importantly, the musical intervention reflected the educator’s professionalism with regard to attitude, behavior, and communication skills. Those elements played a significant role in enhancing the learning environment in a positive way.

Future Considerations

There were a few main limitations of this pilot study. These were:

Firstly, the measurement tool did not capture the changes in emotional regulation based on the musical intervention. The conclusions were based on predicted changes based on the literature review. Likert scales in a post activity survey would have captured changes in mood or well-being. Other additional physiological data such as heart rate and blood pressure could have also been measured as objective findings.

Secondly, while the musical selections were based on criteria determined by the teaching faculty to be diverse, mood enhancing and positive, the selections were made by the instructor. There was no opportunity for the students to select their choice of music. The students had no opportunity

to skip to the end of the musical piece. Research indicates that participants perform better when the music is easy to identify or familiar [11].

Thirdly, the online sessions limited the audio experience for the students. There was no confirmation that the students were not distracted by other noises in the background.

Fourthly, while the study investigated the relationship between the musical intervention and creation of a positive learning environment and student engagement. The study did not explore the indirect effect of engagement tools on student learning. Further mediation analysis should be conducted to determine whether modifying the learning environment with music would have a positive effect on student achievement of specific learning outcomes. Future studies would determine if musical interventions support student learning – evident in improved performance in formative assessments.

Finally, research showed that when an intervention associated with learning in a new way was introduced – it led to a temporary increase in performance or a positive result – the novelty effect [12]. Studies indicate that 8 weeks or longer is required for the novelty factor to drop to a minimal level [13]. While the post-intervention period was roughly 8 weeks, this study would prove more consistent reports if observed for a longer period. Future studies would observe the teacher and student engagement with this intervention over a longer period.

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Declarations

Ethical Approval NA.

Informed Consent NA

Conflict of Interest The author declares no competing interests.

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