

Turn the Music on!: The Usefulness of Non-Commercial Background Music as an Effective Learning Tool for Higher Education Students

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ABSTRACT

Academically successful students need a variety of effective learning tools to help maximize their study skills (e.g., assimilation and retention). Music is one such tool. Research suggests that music is both useful for and a distraction from studying. A survey from a convenient sample of Sacramento State students was distributed to ascertain which school of thought is supported and to determine if and how Sacramento State students use music as an effective learning tool. Of the 250 students surveyed, 201 reported that they usually study with music in the background. While there are limitations to the results, overall this study demonstrates that music can be an effective learning tool, and that more research is required to better implement music in study environments.

RESEARCH PREMISE

Education, as a process, requires college students to manage and assimilate more information from more academic resources than ever before. With the increase in information volume and the academic demand to comprehend said material, new learning tools and study methods must be identified and developed to meet this demand. Academic study skills that assist in the assimilation and retention of required academic coursework must be maximized in order to increase academic success. New learning tools must be combined with existing study skills methods, to maximize study effectiveness that leads to improved academic success and retention of higher education students. The effectiveness of non-commercial background music as an effective learning tool has been the subject of research examination for many years.

New technologies have made a variety of new devices, resources, and methods available to students for storage, recall, and recording of information and music. These devices are affordable and available in a variety of formats, subjects and languages. When utilized appropriately, this technology can be an effective learning tool by diminishing the variable of such resources being too expensive, unavailable and inaccessible. Music, as a learning tool, may assist many undergraduate students improve their study skills by creating study environments that complement the learning experience. Technology elevates the usefulness of

this important learning tool. Students maximize what is studied by maximizing how it's studied.

This researcher has found that music not only creates an environment that increases study effectiveness but also aids in the recall of learned information during examination or other performance evaluations. The researcher has further found that appropriate use of background music (e.g. a music source not blaring) can increase concentration and evoke a productive learning environment. The research conducted numerates the occurrence of using music as a learning tool among a sample segment of undergraduate students at Sacramento State and compares these values against the evidence of existing bodies of research regarding the use of background music as an effective learning tool. How undergraduate study skills can be improved through the use of background music from a non-commercial resource is the focus of the present study. This researcher hypothesizes that music is an effective learning tool that can be used by higher education students to enhance their academic study skills performance and environments.

LITERATURE REVIEW

A scholarly review of literature was conducted utilizing the following areas of study as search parameters: the correlations between music and learning, sound and learning, and the use of music as a background resource during study. The scholarly literature reviewed was extracted from both electronic and hard copy resources. The research questions attempt to fill the gap between the scholarly bodies of evidence that both oppose and support the points of view regarding the use of non-commercial, background music as a useful learning tool that can be used by students in higher education to improve academic study skills. The research question addresses the differences between two opposing bodies of evidence and therefore attempts to draw conclusions based on the relevance of existing research against the findings of this research.

Music and Learning

The link between music and learning has generated much discussion and research. This information is part of a growing body of evidence that suggests that music and learning are correlated however; fact-based research exists that reveals findings that support and refute such a conclusion. A research study published in the *Psychology of Music Journal* (Piro and Ortiz 2009) found that children who were exposed to music training performed better on vocabulary and reading comprehension tests than those who were not. The researchers hypothesized that studying music helped the children develop the mental coding systems necessary to learn language.

When studying, focus is essential. External distractions such as cellular telephones, computers, family/friends and physical needs compound with

internal distractions such as self-doubt, anxiety, fear, anger and ego to diminish study focus. Distraction-free study locations and a positive study mood are effective learning tools that improve study skill performance (Bradley 2001, 26). Findings from fact-based research both support and refute the correlation between music and learning (Smith 1985, Pearall 1989, Bradley 2001). Each research resource supports their conclusion with sound rationale but many times fail to address the influence of direct and indirect variables, which undermine confidence in repeatability and reliability. Rationale for this research is founded in a passionate pursuit of evidence, which will clarify the effectiveness in these findings with a survey-initiated discussion regarding the appropriate use of non-commercial music as a learning tool for higher education students.

Sound and Learning

Research has demonstrated that academic comprehension, retention, and recall can be improved through the use of background, non-white noise (Smith 1985, 591-603). The research further states that music as background noise acts, in an environmental context, to complement the learning environment. Music can be described as a facilitative retrieval scheme that, when used as a background study environment may improve or maximize academic performance. Memory can be enhanced, within a musical environmental context, to modify the learning experience through contextual cuing. Cuing can be generated through either visual and/or sound stimuli but the result of this cuing is a heightened context-dependent memory. A study by the Stanford University School of Medicine (Levitin and Cook 1996, 927-935) found that listening to music can help the brain focus and organize information. During this study, which was designed to measure how the brain sorts out different events, researchers stumbled upon a concrete physiological link between the acts of listening to music and learning. The researchers played short symphonies by obscure 18th-century composers to human subjects while scanning their brains with functional magnetic resonance imaging, or fMRI. The research group found that music 'lights up' areas of the brain involved with making predictions, paying attention and committing details to memory. Under certain conditions, listening to music helps the brain focus and respond in a tightly synchronized manner.

For decades, researchers have been studying the link between learning and listening to music. The concept was first introduced in the early 1990s, when Dr. J.S. Jenkins coined the phrase 'the Mozart effect.' The term referred to Dr. Jenkins' finding that listening to music composed and performed by Mozart could temporarily improve performance on certain spatial-temporal reasoning tasks, such as the Stanford-Binet IQ test (Jenkins 1993, 170-172).

Research suggests that listening to background music prior to task performance increases cognitive processes, such as attention and memory, through the

mechanism of increasing arousal and positive mood (Perham 2010, 625-631). However, according to Perham, the best music for studying is none at all. He recommends complete quiet or ambient noise, like soft conversation or muted traffic for the optimal study background. Listening to some tunes while studying does not necessarily help one's recollection of material however there is no proof that listening to music is an automatic hindrance. Traditional values render the notion that if you want to concentrate on work one must remove all distractions. Conclusions under these research conditions considered music to be a distraction.

Background Resource Study

University of Wales Institute in Cardiff, United Kingdom researchers examined students' ability to recall information in the presence of different sounds. The researchers instructed 25 participants between ages 18 and 30 to memorize a list of letters in order (Perham and Vizard 2010, 625-631). Participants were tested under five listening conditions: no music, music that they said they liked, music that they said they didn't like, a voice repeating the number three, and a voice reciting random single-digit numbers. The results of the research were obtained by the researchers quantifying the participants recall ability via post-test examination.

Research findings revealed that individuals who listened to music; those who liked or disliked the music, recorded the lowest recall assessment figures. Those participants that heard a voice reciting random numbers also recorded low post-test recall values. The highest recall values were recorded equally between the no music and the while listening to the repeated number three test groups. The researchers concluded that when the background "music" is a repeated number that this audio sequence may impair cognitive abilities because if one is trying to memorize things in sequence, another numerical sequence would cause confusion, internal distraction, and disorientation via additional indirect variables and on-going cerebral attempts to discern between important, to be remembered numbers, and those considered as background (Boltz and Kantra 1991, 593-606). The researchers further speculated about the direct variable of the external distraction of voice inflections and monotony of a repeated number sequence. The presence of such variables reduced confidence in post-test exam results.

Problem Statement

Which of these two schools of thought is correct? Is there some middle ground of understanding that incorporates a combination of understanding from both camps of thought? This research seeks to answer the following questions: Is the playing of background music an effective learning tool or a study distraction? Has technology improved the availability, accessibility and affordability of music devices that can be utilized as effective learning tools? Can findings derived from a survey of higher education peers at Sacramento State provide clarity regarding whether the use of

music is an effective learning tool when compared to results derived from the review of existing literature? Literature review quantifies examination results of research that tests pre, post and the absence of background music conditions but does not give consideration as to how the use of such tools make students feel while studying.

METHODOLOGY

To ascertain the impact of listening to music while studying has on higher education students, a hand-distributed, hard copy survey of Sacramento State undergraduates was undertaken in May 2011. Assisted by McNair faculty mentor, Ernie Hills, Ph.D., the researcher implemented a ten-question survey to 250 volunteer students on campus on five separate occasions. The surveys were distributed at different times of the day and in different locations across campus. The survey was conducted over a two-week test period. Research results were compared against results from existing literature.

The students were asked to complete an anonymous survey that addressed their study habits and study conditions. Questions were designed to determine the number of times music was played in the background while studying and tallied opinions and feelings, regarding study experiences under said conditions. The ten-question survey consisted of one yes/no question, three “free write” questions, and six 1 through 5-Likert-scale questions.

The research survey was administered by varying the selection, invitation, and of research participants and by executing a scripted verbal invitation and convenient selection process. Participant recruitment in this research project was initiated by verbal invitation to at-large, curious individuals passing by survey table during research assessment period. Invitation to participate was at the convenience of available individuals, without regard to sex, race, physical appearance/capability or age. Any individual passing by the research station during the survey process was considered part of a viable participant pool of available higher education students.

All participants were undergraduate students at Sacramento State. No attempt was made to identify participants beyond questioning if said individuals were undergraduate students. Surveys were distributed at 5 different locations during the research time period. Variations in survey locations maximized the opportunity of interacting and inviting participation from as large and varied a survey applicant pool as possible.

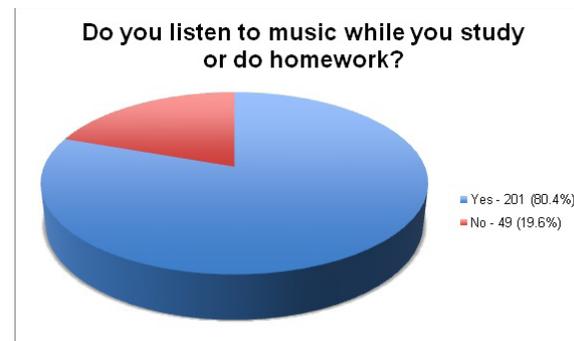
RESULTS

The following ten questions were presented to survey participants:

1. Do you listen to music while you study or do homework?

Figure 1

Listening to Music while Studying or Doing Homework



Of 250 higher education students surveyed 201 students (80.4%) reported they listened to music while studying. This represents a frequency ratio of four to one. Clearly, the findings of this research indicate that a majority of students listen to music while studying.

2. Please indicate the frequency you listen to music while studying.

Table 1

Frequency by which Students Listen to Music while Studying

| | Number | Percent |
|--------------|--------|---------|
| Never | - | - |
| Rarely | 34 | 17 |
| Occasionally | 58 | 29 |
| Usually | 46 | 23 |
| Always | 63 | 31 |
| Total | 201 | 100 |

Students were provided with the option of choosing a number between 1 (Never) and 5 (Always) to indicate the frequency by which they listen to music while they study. It is reasonable to infer that the use of a likert scale would equate to the following: 1 – Never; 2 – Rarely; 3 – Occasionally; 4 – Usually; and 5 – Always. Given this inference, an examination of the students that indicated they listened to music while studying (201 students) revealed that seventeen percent rarely listen to music while studying; twenty-nine percent occasionally listen to music while studying; twenty-three percent usually listen to music while studying; and thirty-one percent always listen to music while studying. Table 1 shows that fifty-four percent of these students usually or always listen to music while studying indicating that it is part of their regular study regimen.

3. Please indicate if listening to music while studying assists in shutting out distractions?

Table 2
Shutting Out Distractions with Music

| | Number | Percent |
|------------------|--------|---------|
| No Shut Out | 2 | 1 |
| Minimal Shut Out | 36 | 18 |
| Some Shut Out | 56 | 28 |
| Mostly Shut Out | 52 | 26 |
| Shut Out | 55 | 27 |
| Total | 201 | 100 |

Students were provided with the option of choosing a number between 1 (No Shut Out) and 5 (Shut Out) to indicate if music helps shut out distractions. It is reasonable to infer the use of this scale would equate to the following: 1 – No Shut Out; 2 – Minimal Shut Out; 3 – Some Shut Out; 4 – Mostly Shut Out; and 5 – Shut Out. Given this inference, the examination of the students revealed the one percent has no shut out; eighteen percent saw minimal shut out; twenty-eight percent saw some shut out; twenty-six percent saw most shut out; and twenty-seven percent did experience shut out from distractions. Table 2 shows that a collective eighty-one percent at least experienced some shut out from distractions.

4. Please indicate the mood, listening to music places you into while studying?

Table 3
Mood and Music while Studying

| | Number | Percent |
|------------------|--------|---------|
| Unhappy | 0 | 0 |
| Somewhat Unhappy | 0 | 0 |
| Neither | 25 | 12 |
| Somewhat Happy | 73 | 36 |
| Happy | 103 | 51 |
| Total | 201 | 100 |

Students were provided with the option of choosing a number between 1 (Unhappy) and 5 (Happy) to indicate the mood music placed them while studying. IT is reasonable to infer that the use of the likert-scale would equate to the following: 1 – Unhappy, 2 – Somewhat Unhappy, 3 – Neither, 4 – Somewhat Happy, and 5 – Happy. Given this inference, the examination of the survey responses indicated that thirteen percent were neither; thirty-six percent were somewhat happy; and fifty-five

percent were happy. In other words, over ninety percent of students indicated that music placed them in a somewhat happy or happy mood.

5. What genre/type(s) of music selections do you listen to while studying?

The variation in music types and genres reported was as varied as the cross-section of students participating. Music types reported ranged from smooth instrumental jazz to Tibetan bowl chants; and from environmental soundtracks of chirping birds in a meadow with bubbling brooks to slash, speed-metal grunge rock. Variety in the availability of music types can be the key that allows the appropriate use of background music to successfully create positive study environments, regardless of a student’s location or physical environment tailored to the individual.

6. Please indicate the degree of enhancement the quality of your study is improved because you listen to music:

Table 4
Listening to Music and Enhancing the Quality of Study

| | Number | Percent |
|----------------------|--------|---------|
| No Enhancement | 2 | 1 |
| Little Enhancement | 2 | 1 |
| Moderate Enhancement | 66 | 33 |
| Largely Enhanced | 48 | 24 |
| Greatly Enhanced | 83 | 41 |
| Total | 201 | 100 |

Students were provided with the option of choosing a number between 1 (No Enhancement) and 5 (Greatly Enhanced) to indicate the enhancement in their studying period. It is reasonable to infer that using the Likert-scale would equate to the following: 1 – No Enhancement; 2 – Little Enhancement; 3 – Moderate Enhancement; 4 – Largely Enhanced; and 5 – Greatly Enhanced. Given this inference, the examination revealed that 2 percent saw little or no enhancement; thirty-three experienced moderate enhancement; twenty-four experienced large enhancement; and forty-one percent experienced great enhancement. Table 4 shows that sixty-five percent saw large to great enhancement in their study periods.

7. Do you experience an increase in study comprehension, memory, and/or retention (as expressed in improved study effectiveness, time management, or successful course examination scores) as a result of listening to music while studying?

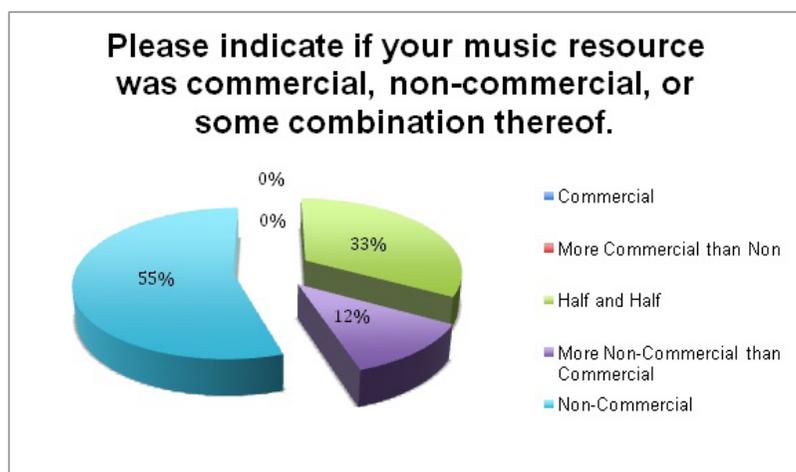
Table 5
Listening to Music and the Increase in Study Benefits

| | Number | Percent |
|--------|--------|---------|
| No | 2 | 1 |
| Unsure | 144 | 72 |
| Yes | 55 | 27 |
| Total | 201 | 100 |

Students were provided with the option of choosing a number between 1 (No) and 5 (Yes) to indicate any increase in the students' study benefits (comprehension, memory, and retention) as a result of listening to music while studying. It is reasonable to infer that the use of the Likert-scale would equate to the following: 1 – No; 2 – 4 - Unsure; and 5 – Yes. Given this inference, the examination revealed that one percent experienced no increase; seventy-two percent were unsure; and twenty-seven percent experienced a significant increase. Table 5 shows that over twenty-five percent of students reported an increase in study benefits attributed to listening to music; however. Most students were unsure of this result.

8. Please indicate if your musical selection resource is commercial or non-commercial (without vocal disc-jockey, advertisement and/or other inter-song, non-musical interruptions) or some combination thereof?

Figure 2
Type of Music Resources Used during Study Periods



Students were provided with the option of choosing a number between 1 (Commercial) and 5 (Non-Commercial) to indicate what type(s) of music resources are used during study periods. It is reasonable to infer that using the Likert-scale would equate to the following: 1 – Commercial; 2 – More

Commercial than Non-; 3 – Half and Half; 4 – More Non-Commercial than Commercial; and 5 – Non-Commercial. Given this inference, the examination revealed that thirty-three percent used a half and half combination; twelve percent used more non-commercial than commercial resources; and fifty-five percent used non-commercial resources. In other words, most survey participants primarily used non-commercial resources.

9. Which non-commercial, musical resources do you listen to while studying? Please circle all that apply.

The following on-line music resource Web Site locations were utilized by those participants who use music as a study aid:

- a. Qtrax - free downloads, stream a wider selection of songs online.
- b. Jamendo - offers tens of thousands of full albums for download.
- c. Pandora Radio – a leader in Internet radio, innovative use of algorithms to play songs based on music you already like, customize listening experience by rating artists played.
- d. Last.fm - online radio station offering a customized experience. The site recommends artists based on your musical tastes, and features allow you to track your listening history and share music with friends.
- e. Y! Music - A Yahoo! Internet radio stations, Y! Music has listening options for mood.
- f. Stereogum - indie variety featuring lesser-known acts, features mp3s and streams of album tracks and live performances.
- g. Pitchfork – indie, original material and links audio/video from various genre defying bands, access to album tracks, concert recordings and exclusive sessions.
- h. Internet Archive - cultural artifacts in digital form, the Internet Archive of free recordings and concerts for download.
- i. Soundclick - up-and-coming artists, all genres, more than four million songs, free to download or stream.
- j. iTunes.com - Apple's iTunes offers music for sale, many no-cost features of the application, stream hundreds of radio stations.

Online Music Search Engines

- a. Songza - a music search engine and Internet jukebox, search for songs, share tunes with friends, play music on computer.
- b. Qloud - combines a music search engine with social networking, connects users with free music from an endless library.

- c. Playlist Music Search Engine - locates music files on the web, played or saves to personal playlist.
- d. SkreemR - an mp3 music search engine, can search for music, podcasts, speeches and more.
- e. Mp3Realm Search Engine - audio in mp3 format. Searches based on artist, title, genre or album.
- f. FindSounds - sound effects and instrumental samples, wide range of file formats.
- g. Absolute Lyrics - music lyrics database
- h. Musipedia - a music encyclopedia, searchable collection of music and musical themes.
- i. SongFacts - search for song information compiled by radio professionals and music enthusiasts, lyrics, song meanings and trivia.
- j. Used CD Search - find and compare prices on used and rare CDs.

Online Internet Radio

- a. AOL Radio - 350 Internet radio stations with song skipping, music, news, sports and talkmusic.aol.com/radioguide/bb
- b. Live365 Internet Radio - members create own online radio station or listen to other Live365 broadcasters' online stations.www.live365.com
- c. Last.fm - tracks played tells a profile about what you like, can connect to other people who like what you like and recommend songs from their music collections.www.last.fm
- d. Pandora Radio - a personalized Internet radio service that finds new music based on favorites.www.pandora.com
- e. Radio-Locator - listing of international radio stations with have web pages. www.radio-locator.com
- f. RadioTower - access to live Internet radio feeds.www.radiotower.com
- g. SHOUTcast - Internet radio stations from international DJs and broadcasters. www.shoutcast.com
- h. Yahoo! Music - music videos, Internet radio, music downloads, music news and information.new.music.yahoo.com

10. Why do you listen to these music resources while studying? Please explain!

Common responses among participants included: "I do not like the sound of silence"; "listening to music when I study helps keep me motivated and on track with getting the work done"; "...it helps to eliminate distractions"; "the music is

free, easy, relaxing, calming, habit forming, convenient, consistent, and helps to keep the mind creative and enjoyable."

DISCUSSION

How to be successful in class is the goal of every student. How to study, take notes, focus and manage time are study strategies that higher education students use to achieve this goal. However, study skills are not intrinsic; they can be learned. Creating the proper study environment to maximize concentration and identifying learning style to recognize how a student learns (e.g., listening to music while studying) can be essential learning tools. Research utilized was flexible, easy to utilize to the sample study group population and offered a range of research data and findings for interpretation and analysis. The assessment of each participant's mood was self-identified. No attempt was made to ascertain the importance of being in this type of mood or emotion during study but it's queried, in the context of the necessity of having a variety of learning tools available in the study skill tool belt to maximize study success. Data gathered during research survey provided a unique opportunity to obtain detailed insight into the learning environments of a segment of Sacramento State students. Feedback came directly from respondents and the comparison of the research survey findings against existing evidence measured the strength and opinion of Sacramento State students against the wisdom and conclusions of previous research.

LIMITATIONS

There are over 32,000 undergraduates on campus at Sacramento State. A sample size of 250 students represents 0.78% of the total student body. The size of the research population is a direct relation to the degree of confidence in the research conclusions.

The range in music type and genre were well described in the research findings. This wide variation in music becomes an indirect variable when research speaks to the appropriateness of music as an effective learning tool. What may be an effective music study skill resource for one individual may in fact be a great source of distraction and interruption for another. This indirect variable becomes an issue when research attempts to articulate the effectiveness of any one style of music as its baseline for research examination. This researcher maintains that in order to achieve the anticipated outcome of increasing study effectiveness by elevating the mood of the student then the student must be the individual who makes the music selection, not the researcher. This way, understanding of the usefulness of background music as a positive learning tool can be appropriately analyzed.

Analysis of research survey responses represents a snapshot in time of each survey participant's opinion at that moment in time. The moment the data were collected

it began to decrease in confidence due to the increasing age of the data set and the perchance that survey participants may later change a survey participants' opinion and study practices. Participants were invited to participate based on the response to a verbal invitation. If participants were unable to provide accurate descriptions of their study habits then the usefulness of said survey data reduces the confidence of any conclusions reached as a result of the research project.

Compounded with the identification of the use of background music as an effective learning tool for higher education students the research survey directs attention as to how the use of music is effective. Research questionnaire analysis required the analysis of multiple variables at the same time to establish fundamental understanding as to how music was beneficial to survey participants. This type of analysis is useful in discovering how a set of one variable can explain one or more other variables. While this discussion gives clarity to the analysis of research data, many times the variability of other subsequent variables usually lends itself to ask more questions giving rise to discussions regarding future research topics.

CONCLUSION

This research revealed that a larger percentage of the Sacramento State students sampled listen to non-commercial background music as an effective learning tool assisting them in improving their study skills success rate. Research surveys listed empirical foundations on which to develop and implement new strategies filling the gaps of information within the existing research on this subject. Survey trend and peer comparison data to existing research proved inconsistent with studies refuting the effectiveness of music as an effective learning tool. A longer series of surveys from a larger survey population is required to confidently track, successfully establish and change reputable evidence supporting one school of scholarly thought on this subject.

In conclusion, the research compares the findings from both schools of thought regarding the usefulness of non-commercial background music as a learning tool but was unsuccessful in establishing the prevalence of such behavior among Sacramento State students because such occurrence may have been based on the relative ease of music accessibility, availability and affordability, because of advancements in technology, and many trends, that shift student behavior and study skill techniques over time. What may appear appropriate and useful one day maybe refuted by scholarly findings from the next research expository on the subject.

FUTURE RESEARCH

Future research on the use of non-commercial background music as an effective learning tool must address the wide range of music available to students to best achieve this goal. This research revealed a very wide range of music that was employed during study. Clearly, what was considered an appropriate use of one music genre would not work at all for another student. Music preference has a direct affect on the success value of any non-commercial music resource being considered as a viable learning tool. Future research must examine the relationship between music selection and the wide varieties of music styles available in which to achieve this goal. In order to gain clarity and confidence in existing and on-going research on this subject, influences from direct and indirect variables must be minimized.

Several studies indicate that mood can influence the likelihood of an individual to use background music as an effective learning tool (Bower 1981, 129-148, Bradley 2001). A previous laboratory study indicated that music could be used to bring about manipulations in mood and emotion before and during study.

New research on the importance of emotions that create moods for study, hearing music at the same time as doing the expected task, and hearing something you like as a learning tool to improve study skill performance should be examined.

Music can affect you in a variety of ways. Depending on the type of music you listen to you can change your brain waves to make you achieve a higher state of awareness/concentration. The way instrumental music can induce the brain into an alpha brainwave state and silence as a distraction are subjects for future research.

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