ATTITUDE OF TEACHERS AND STUDENTS TOWARDS USE OF INSTRUMENTAL MUSIC TO ENHANCE ACADEMIC ACHIEVEMENT IN PHYSICS IN RONGO SUB- COUNTY, KENYA.

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ABSTRACT

Attitude towards instrumental music by either the teachers or students could lead to lack the benefits associated with instrumental music in studying. This descriptive Survey in Rongo Sub- County used one large school that has a relatively big population of Physics students and Physics teachers. Sixty two students and 9 Physics teachers formed the sample population of this study. Questionnaires were used to collect data. Quantitative data was coded and analysed with SPSS version 22.0 to frequencies and percentages. Qualitative data was analysed thematically.

The study established that majority of the students had a positive attitude towards using instrumental music while studying Physic theory and practicals. The study also established that majority of the teachers have a positive attitude towards allowing their students to study Physics with Instrumental Music. However, only a small percentage of the teachers (22.2%) were comfortable allowing their students to perform experiments while listening to instrumental music in the background. Most of the physics teachers were apprehensive towards allowing their students to perform experiments with Instrumental Music.

Keywords: Instrumental Music, music studying, experiments, attitude of teachers and students

INTRODUCTION

Music has a short term effect on attitude, emotions, mood and motivation and contributes positively to student learning (Heather, 2017). Instrumental Music is a resource that when effectively utilized can enhance academic performance of students (Scott & Herring, 2018). The performance of Physics in Rongo Sub- County from the years 2020 to 2022 has averaged 30.571% which was even below the National KCSE mean of Physics over the same period which stands at 32.757%.

Even though Instrumental Music can enhance academic performance of students (Scott & Herring, 2018), if the attitude of the teachers or students towards use of Instrumental Music in Physics is negative, then the positive impact of Instrumental Music in Physics Education would be a pipe dream.

Instrumental Music is less disturbing to learners as it contains no lyrics and can act as a positive stimulus towards learning.

Creativity is always encouraged in the learning of Physics, and listening to happy music enhances divergent thinking which is a key element in creativity (Ritter & Ferguson, 2017). Designers for instance had a better perception on their designs when background music was playing in their work stations (Dolegui, 2013). Despite these immense benefits that inclusion of Instrumental Music can bring to the learning of Physics, its uptake will depend on the attitude of key educational stakeholders towards Instrumental Music use in Physics; key being teachers and students.

Use of music in kindergarten school is well pronounced and established. Elementary school pedagogy has a rich history of use of music in its implementation. The use of music in Elementary School has enabled its pedagogy to be both fun and enjoyable to its learners. Children are happy and always looking forward to the next day in school. Phillip (2010) did a study on preservice elementary classroom teachers' attitudes toward music in the school curriculum and teaching music. One of the questions asked in the questionnaire of the study is whether music should be integrated with other subjects in the curriculum and whether music study could improve academic achievement in other disciplines. According to the study's results, majority of Preservice Elementary Classroom Teachers (89.7%) agree that music study can improve achievement in other disciplines and 70% of them agree that the general music specialist should integrate music with other subjects.

Ozgul (2017) did a study on prospective classroom teachers' attitudes toward music education in teacher education program. According to the researcher the study entailed determining prospective classroom teachers' attitudes toward music in the classroom teacher education program in Turkey in terms of musical background and experiences, comfort level integrating music with core and other subjects, teachers perceptions of importance of subjects in the teaching program and the level of importance of outcomes of the general music education.

Sample questions asked in part one of the questionnaire included "I would feel comfortable integrating music with other subjects (i.e., social studies, language arts) in an elementary classroom, "The classroom teacher and should integrate music with other subjects (i.e., social studies, science, and math, reading...") The study results showed that 74.5% of the participants feel comfortable integrating music to different subjects. In the study 72.2% of the participants agree that the classroom teacher and the general music specialist should integrate music with different subjects.

In Croatia the attitude of Music teacher trainees towards use of music in learning is positive (Nikolic,2018). The attitude of Physics teachers and students in Rongo Sub- County towards use of Instrumental Music in Physics Education has scarcely been explored.

This study aimed to find out the attitude of teachers and students towards Instrumental Music studying in Physics.

THEORETICAL FRAMEWORK

This study was anchored on Seligman's (2011) theory of positive psychology. Positive psychology is about scientifically informed perspectives on what makes life worth living. It focuses on aspects of the human condition that lead to happiness, fulfilment, and flourishing. It focuses toward more positive psychological topics, such as well-being, contentment, hope, optimism, happiness, savoring, human strengths and resilience. Positive psychology emphasizes under-standing the factors that build strengths, help to people flourish and contribute to mental health, as well as on subjective well-being and happiness; factors and processes which underlie optimal human functioning (Balogh, Kun, & Krasz, 2017).Positive psychology seeks to understand what works, what is going well for people, and what leads to feelings of happiness and flourishing within individuals' lives. (Jared, 2018).

Music has the ability to trigger positive emotions in individuals. Music can be used to relieve stress and reduce boredom. When students have a positive attitude towards engaging in learning while Instrumental Music is playing in the background, they enjoy performing academic tasks and overall contribute to the well-being of the students.

When teachers also feel Instrumental Music can help aid the academic achievement of their learners, they become enthusiastic in allowing their learners to engage in academic tasks while Instrumental Music is playing in the background.

RESEARCH OBJECTIVE

The objective of the study was to find out the attitude of teachers and students towards use of Instrumental Music to enhance academic performance in Physics.

METHODOLOGY

The researcher used Descriptive Survey Design for this study. Purposive sampling was used to sample Kodero Bara High School since it had a relatively larger population of Physics teachers and students taking Physics in Rongo Sub County. The school sampled also was one that drew students across Rongo Sub- County. The study targeted 987 Form Three Physics students and 23 Physics teachers in Rongo Sub- County. Nine teachers and 62 students were then sampled for this study.

Questionnaires were administered to both physics teachers and physics students in the sampled school. Quantitative data collected was coded and analysed using SPSS version 22.0. The Quantitative data was then analysed and presented in frequencies, mean and percentages. Qualitative data collected was analysed and presented in major themes and patterns exhibited. The research questionnaires had validity and had a coefficient alpha value of 0.73 and were therefore reliable.

RESULTS AND DISCUSSION

To begin with, teachers were asked through the questionnaire if they liked to listen to Instrumental Music or Not. The results showed that 77.8% responded that they liked to listen to Instrumental Music while 22.2% responded that they did not like to listen to Instrumental Music. Furthermore, the teachers were asked if they had ever done any activity while Instrumental Music is playing in the background and 88.1% responded yes while 11.1% responded no. this suggests that a huge majority of the teachers do not mind multi-tasking with instrumental music. when asked if they preferred their students to study physics with instrumental music; 44.4% responded yes while an equal percentage of 44.4% responded no, 11.1% responded not sure.

This implies that teachers are equally divided on whether or not their students should study with Instrumental Music playing in the background. Key reasons stated by the teachers who were for use of Instrumental Music in studying Physics by their students included; that Instrumental Music increases focus of the students and allowed them to concentrate better; that Instrumental Music increased the alertness of the students since most senses are stimulated; that Instrumental Music is positively enticing and enlightened students on other things apart from Physics. Through one of the teacher questionnaire, one teacher who was for integrating Instrumental Music in the studying of Physics stated:

Bringing Instrumental Music in the background would make students more active as most of the senses will be at work. (Case No. 6)

Teachers against use of Instrumental Music during studying noted the following reasons behind their objection; that Instrumental Music diverted student's attention; that students have a low concentration span and use of Instrumental Music would further damage their concentration; that students are unique and therefore may not necessarily embrace Instrumental Music studying. When further queried how comfortable they are allowing their students to perform Experiments with Instrumental Music; 1teacher responded very comfortable (5), 1 teacher responded quite comfortable(4), 2 teachers responded neutral(3), 3 teachers responded not comfortable(2) and 2 teachers responded very uncomfortable(1) giving a mean of 2.555. This suggests that few teachers are comfortable allowing their students to perform experiments with Instrumental Music. To support this, one teacher stated in the questionnaire that:

Such music will divert attention of learners
during Physics practical. (Case No. 7)

The main reasons as noted by the teachers behind their objection included: that Instrumental Music diverts students attention; that Instrumental Music can be disruptive and experiments requires simple and less disruptive interventions; that learners particularly teenagers have a low concentration span and Instrumental Music would further negate their concentration span; that learners are unique and may not necessarily like Instrumental Music.

The teachers who were comfortable in integrating Instrumental Music during experiments felt that Instrumental Music made experiments interesting, increased attention span of students during experiments and made the students more alert.

The teachers were further probed on aspects that are involved in Instrumental Music studying. The aspects were; Q1 (Can Improve Academic Achievement in my subject) Q2(Can Improve Academic Achievement in other Disciplines) Q3 (Should be integrated in other subjects) Q4 (Can Improve students Attention during prep) Q5 (Makes prep interesting to learners) Q6 (Can make students want to study Physics for longer)

Table 1 details responses on each aspect measured on a four range Linkert scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD).

Table 1: Attitude of Teachers T`owards Music in Studying

Using Instrumental Music in Physics studying:	**SA (4)**	**A (3)**	**D (2)**	**SD (1)**
Q1	2	6		1
Q2	1	6	1	1
Q3	3	5	1	
Q4	1	5	3	
Q5	1	6	1	1
Q6	3	3	2	1

Table 1 show the responses of the 9 teachers on various aspects involved in studying with Instrumental Music.

From Table 1, Q1 had a mean of 3.000, Q2 had a mean of 2.778, Q3 had a mean of 3.222, Q4 had a mean of 2.778, Q5 had a mean of 2.778 and Q6 had a mean of 2.889. Therefore from the mean of item Q1 and Q2 of 3.000 and 2.778 respectively, it can be implied that most of the teachers feel Instrumental Music can help them improve academic achievement in their subject while and equally abet other subjects to better their academic achievement. Item Q3 had a tabulated mean of 3.222 and hence showed that most teachers do not mind Instrumental Music being integrated in other subjects.

The findings of this study on the attitude of teachers towards Instrumental Music studying as outlined in Table 1 align with the findings of Philip (2010). According to Philip (2010) 89.7% of Preservice Elementary Teachers agree that music study can improve academic achievement in other disciplines. In this study most of the Physics teachers in Rongo Sub- County agree that Instrumental Music studying can improve academic achievement in other disciplines. Therefore both groups of teachers are in agreement on the beneficial effects of music studying that may be of benefit to other disciplines if utilised. In Philip (2010) also, 70% of the teachers agree that should be integrated with other subjects while in this study most of the Physics teachers agree to the same (Mean of Q3=3.222). Therefore in both studies, both set of teachers agree to have music playing a role in the learning of subjects.

The findings as shown in Table 1 seem to concur with opinions of students in the study of Cerelo and Jerald (2018) who looked at listening to music and academic achievement of senior high school students in the Philippines. In Cerelo and Jerald (2018) 72% of the student population who listened to music while studying said they did so because it's relaxing while 24% said they did so because it helps them to focus more on their study.

Furthermore the positivity expressed by secondary Physics teachers towards integrating music with other subjects is similar to that of elementary school teachers who in themselves feel comfortable integrating Music with other subjects (Ozgul, 2017). In the study of Ozgul (2017), elementary school teachers registered their responses via a questionnaire with regards to integrating Instrumental Music in elementary school pedagogy. Ozgul (2017) recorded that 72.2% of the teachers agree that music should be integrated with other subjects while in this study majority of the teachers agree that Instrumental Music should be integrated in other subjects. The music in elementary school pedagogy is well pronounced and widely positively regarded and from the findings of this study on this objective, it seems like Physics teachers in Rongo Sub County have a positive attitude too towards integrating Instrumental Music in high school curriculum. As shown in Table 1, most of the teachers feel Instrumental Music makes preps interesting (Mean of Q5= 2.778) for students and can make students want to study for longer (Mean of Q6= 2.889).

When the teachers were asked how effective they thought music studying is towards improving academic performance of students in Physics. Their responses are outlined in Table 2.

Table 2: Teacher Responses on Effectiveness of Music Studying

	Frequency	Total
Very Effective (4)	1	4
Quite Effective (3)	6	18
Not Effective (2)	1	2
Quite Ineffective (1)	1	1
Mean	25	2.778

Table 2 details teacher responses on how effective they felt Instrumental Music studying is towards improving academic achievement of their students in Physics.

From Table 2, 1 teacher felt it's very effective, 3 teachers felt it's quite effective, 1 teacher felt it's not effective while 1 teacher responded that it's quite ineffective. This gave a tabulated mean of 2.778 revealing that most teachers felt Instrumental Music is effective towards improving academic achievement of their students in Physics. Therefore attitude of teachers towards use of Instrumental Music to enhance academic achievement is Physics is positive with most teachers saying Instrumental Music is effective towards improving academic achievement of students in Physics.

Similarly the findings of this study align with the findings of Nikolic (2018) that found out that the attitude of teacher trainees towards Music Education is positive.

In order to achieve this objective, students were given questionnaires to fill and their feedback noted. Firstly students were asked if previously before they took part in this research they had heard about Instrumental Music studying; 77.2% responded NO while 22.8 responded YES implying a lot of students had not been exposed to Instrumental Music studying. The students were queried too if they had previously studied Physics with Instrumental Music; 96.5% responded NO while 3.5% responded YES implying that a big percentage of students had never experienced Instrumental Music studying in Physics.

On preference, the students were asked if they preferred to study Physics with Instrumental Music ALWAYS or preferred to study Physics with Instrumental Music SOMETIMES or if they indeed preferred to study Physics in SILENCE without Instrumental Music. With regards to this question on preferred mode of study, 33.3% responded ALWAYS, 47.4% responded SOMETIMES while 19.3% responded that they preferred to study Physics in silence without Instrumental Music.

This implies that majority of the students (80.7%) prefer to integrate Instrumental Music in their Physics study at one time or the other. In the study of Emily (2015) students aged 10- 11 years were made to carry out their studies in silence for one week and after that allowed to carry out their studies with Instrumental Music for one week. At the end of every week, the students were subjected to an achievement test. At the end of week two, the students were given a questionnaire to fill out with regards to use o Instrumental Music in their learning. In the study of Emily (2015), students in the study were also asked if they preferred there be no background music playing in the background while they were working.

More specifically in the study of Emily (2015), for Instrumental Music, 56% of the students said they preferred to have Instrumental Music playing in the background as they are studying. Therefore in this regard, the findings of Emily (2015) are similar to the findings of this study where majority of the students prefer to study with Instrumental Music. Even though there exists a difference in the age set of participants in Emily (2015) and this study, majority of participants in both studies have a liking for studying with Instrumental Music. This finding of the study on preference on the mode of study is also in agreement with the findings of Naveen et al. (2016) who studied the effect of listening to music on concentration and academic achievement of medical undergraduate students.

In Naveen et al. (2016), 60% of the students preferred to listen to music while studying. Therefore in both the current study and the study of Naveen et al. (2016), majority of the students prefer to integrate music in their studying. Furthermore, majority of participants in this current study therefore would study with music just as majority

of undergraduate students in South Africa (68.5%) as established by Pitman and Rajab (2019) would.

Several key themes were exhibited via student responses in the questionnaire for preference for Instrumental Music studying. The students felt that studying with Instrumental Music; prevented them from sleeping; made it easy for them to study; refreshed their brains, made it easy to remember what they studied; increased their concentration during studying; made them to easily absorb what they read; is relaxing and made studying enjoyable and that Instrumental Music creates conducive environment for studying. Several key themes exhibited by the students for their preference to study with Instrumental Music were also exhibited in the study by Naveen et al. (2016). According to Naveen et al. (2016), the responses for the reason to listen to music while studying included; music helped them to pay attention and kept their mind calm, music helped them to prevent sleepiness, music helped them to block any external interference like noises. Therefore themes of music helping students pay/increase attention, music helping students prevent sleepiness during their study, and music making the students calm and relaxed during studying are common themes in both this current study and the study of Naveen et al. (2016) as to reasons behind students studying with music.

Students who preferred to study with Instrumental Music sometimes had the following major themes; one may have different moods which will dictate whether to study with Instrumental Music or in silence; that at times Instrumental Music is distractive; that some concepts are better learnt in silence while some concepts are better understood with music. To support this, one student stated;

In some topics I require total silence to understand while others I feel comfortable while studying with Instrumental Music especially those expressed mathematically. (Case No. 48)

Those who did not prefer to study with Instrumental Music had the following responses behind their preference; that they found Instrumental Music interruptive and hindered their studying; that Instrumental Music made them to easily sleep; that Instrumental Music made them concentrate on the music rather than studying and that Instrumental Music made them to fantasize. The responses quoted by the students who prefer not to study with music are similar to the responses quoted by the students in the study of Naveen et al. (2016).

In Naveen et al. (2016), 78 out of 80 students who preferred to study in silence without music playing in the background said that music playing in the background distracted their attention which was also a major theme quoted by the students in this study as reason behind their preference for studying in silence. To support this, one student stated in his questionnaire that: “Reading with Instrumental Music makes me lose attention to what I am reading.”. (Case no. 7)

The students were also queried on their preference when it came to performing experiments.

In this study 76.9% responded that they preferred to perform Physics experiments with Instrumental Music while 23.1% preferred to perform Physics experiments without Instrumental Music. The above responses indicate that a large majority of students prefer to integrate Instrumental Music in the learning of Physics. Instrumental Music studying therefore has the potential to become a usual practice among high school students just as it is a usual practice among college students as quoted in Navreen et al. (2016).

Interestingly, the researcher queried the students if they thought other students should be allowed to study during evening prep with Instrumental Music in school. Results of this study in this question showed that 61.4% said YES while 38.6% said NO. Notable reasons for the YES responses included; that Instrumental Music made it easy and enjoyable to study, that Instrumental Music increased attention and concentration; that Instrumental Music reduces fatigue and prevents one from sleeping; that Instrumental Music prevented one from making noise; that Instrumental Music too made one understand concepts easily and prevented one from thinking about other things or problems. Reasons behind lack of recommendation for use of Instrumental Music during prep by other students included; that Instrumental Music is disruptive and may make one loose concentration, that Instrumental Music may make one sleep and that other students may not necessarily prefer studying with Instrumental Music.

The students were further asked if they would recommend other students to study with Instrumental Music; 73.7% responded YES while 26.3% responded NO implying that most students think Instrumental Music studying would also be advantageous to their fellow comrades. Those who would recommend Instrumental Music studying to fellow peers were asked to name the subjects they would recommend to their fellow students. Analysis of the study on this showed that 42.9% recommended Math, 23.8% Chemistry, 16.7% Biology, 7.1% English, 4.8% Kiswahili, 2.4% Geography and 2.4% French as the first subject they would recommend.

The students were further probed on various aspects that are involved in Instrumental Music studying. The aspects were Q1 (I am able to concentrate on what I am studying); Q2 (I grasp/ understand concepts easily); Q3 (I improve in my Academic performance); Q4 (I find it easy to study); Q5 (I enjoy studying); Q6 (I want to study for longer). Table 3 details responses on each of the aforementioned aspects measured on a four range Likert scale of strongly agree (sa), agree (a), disagree (d) and strongly disagree (sd).

Table 3: Attitude of students towards music studying

When I Study with Instrumental Music:	**SA (4)**	**A (3)**	**D (2)**	**SD (1)**
Q1	22	35	4	1
Q2	16	36	6	4
Q3	11	35	11	5
Q4	26	20	9	7
Q5	32	21	4	5
Q6	20	17	15	10

Table 3 reveals responses of students on attitude aspects when it came to studying with Instrumental Music such as easiness to study, experience during the study time, effect on their academic achievement and concentration. From Table 3, items Q1, Q2, Q3, Q4, Q5 and Q6 had a tabulated mean of 3.258, 3.032, 2.839, 3.048, 3.290 and 2.758 respectively. Therefore with a mean of 3.258 for item Q1 most of the students feel they are able to concentrate when studying with Instrumental Music. This agrees with the findings of Indira et al. (2018) who looked at effectiveness of music therapy on academic achievement of nursing students and found out that listening to music during studying had positive effects on the concentration of nursing students.

This finding is also in agreement with the finding of Emily (2015) where majority of the students (67%) aged 10- 11 years said that Instrumental Music helped them to focus on their work. Moreover in Emily (2015) 67% of the students said that Instrumental Music did not make it difficult for them to focus on their work. According to Middlebrooks, Kerr, and Castel (2017) distractions and multitasking is detrimental to learning and memory, nevertheless, people often study while listening to music, sitting in noisy coffee shops, or intermittently checking their e-mail.

The researchers examined how distractions and divided attention influence one's ability to selectively remember valuable information. In their study participants studied lists of words that ranged in value from 1 to 10 points while completing a digit-detection task, while listening to music, or without distractions. The study findings noted that even though participants recalled fewer words following digit detection than in the other conditions, there were no significant differences between conditions in terms of selectively remembering the most valuable words. Similar results were obtained across a variety of divided-attention tasks that stressed attention and working memory to different degrees, which suggests that people may compensate for divided-attention costs by selectively attending to the most valuable items and that factors that worsen memory do not necessarily impair the ability to selectively remember important information.

It seems students are able to compensate for the influence of distractions that may be brought by Instrumental Music by using a selective attention approach to place a greater focus on the most important information (Middlebrooks et al., 2017).

The findings of this current study show that most of the students feel they understand concepts easily when they study with Instrumental Music (Mean of Q2= 3.032) and equally majority of the students felt Instrumental Music aided them to improve in their achievement (Mean of Q3= 2.839). Also, majority of the students find it easy to study when Instrumental Music is playing in the background (Mean of Q4= 3.048). Furthermore, most students enjoy studying with Instrumental (Mean of Q5= 3.290) From the above observations noted by this study, the students have a positive attitude towards Instrumental Music studying in Physics. In this current study, most of the students responded that they were able to concentrate on what they were studying (Mean of Q1= 3.258) when they studied with Instrumental Music. In the study of Naveen et al. (2016), 47% of the students believed that music helped them to concentrate on what they were studying. Therefore, in the current study and the study of Naveen et al. (2016), students who study with music agree that music is not a seductive detail towards their concentration.

CONCLUSION AND RECOMMENDATIONS

The findings of this study established that most teachers and students have a positive attitude towards using Instrumental Music during prep to enhance academic performance in Physics. For instance item Q1 had a mean of 3.000 which suggests most of the teachers feel Instrumental Music can help them improve academic achievement in their subject.

Most students too prefer to integrate Instrumental Music in their Physics study at one time or the other (Mean of Q5= 3.290). Most students would also recommend Instrumental Music studying in other subjects.

However, most teachers do not feel comfortable integrating Instrumental Music in experiments. For instance out of the 9 teachers that took part in this study, only 2 teachers felt comfortable allowing their students to perform experiments with Instrumental Music.

The study recommends that Schools can designate rooms where students who choose to study Physics with Instrumental Music can have access and carry out their prep study with Instrumental Music playing in the background in the designated rooms.

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