



EFFECT OF TIMING OF PLAYING INSTRUMENTAL MUSIC ON ACADEMIC ACHIEVEMENT IN PHYSICS AMONG SECONDARY SCHOOL STUDENTS: A CASE STUDY OF KODERO BARA HIGH SCHOOL

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ABSTRACT

During night study, a student may choose to study Physics at the beginning of night study, in the middle of night study or during the latter stages of night study. As such, the attention span of a student may vary depending on what particular time the student was engaged in the studying of Physics. Attention is a key skill in studying as it determines the degree to which a student is focused on the reading material at hand. Low attention will lead to low results as the student will be distracted from his or her academic duty when studying. This paper explored effect of timing of playing instrumental music on academic achievement in physics. Quasi-experimental study design was used in this study. A control group studied physics during prep without Instrumental music playing in the background while experimental groups studied physics during prep while Instrumental music was playing in the background at different stages. There were two experimental groups. One experimental group studied physics during earlier stages prep from about while Instrumental music was playing in the background for all their study periods. The other experimental group studied physics during the latter stages prep from around with Instrumental music playing in the background for all their study periods. The study targeted 987 Form Three physics students in Rongo Sub-County. Purposive sampling was used to select one school that has a relatively bigger population of students taking Physics. For this study, 45 Form Three students formed the sample population. Data was collected using achievement tests and a questionnaire. Qualitative data was analysed thematically and presented using descriptive statistics. ANOVA was used to analyse quantitative data and test the study's hypothesis. The study determined that Instrumental music has the same effect on academic achievement in Physics regardless of what time one decides to study with Instrumental music. Timing of when to study with Instrumental music seems therefore not to be a factor when it comes to affecting academic achievement in Physics. Whether one decides to study with Instrumental music at the beginning of night study or during the latter stages of night study will be inconsequential as far as academic achievement is concerned.

KEYWORDS: Music studying, Academic Achievement In Physics, Instrumental Music, Multi-Tasking, Stages During Prep.

INTRODUCTION

Boarding schools in Kenya usually have night study time for their students at night beginning at about 7pm to 10pm. As such students are required to concentrate for long hours and keep pin drop silence. It can be hard for a student to do this especially after coming from an eight hour teaching program. Many students use music while doing homework, it's important to inform the debate about music by doing more research on that subject (Scott & Herring, 2018). This study therefore aimed to find out who benefitted the most from music studying depending on what time Instrumental music stimulus was introduced during the night study time.

Monica, Priya, and Goyathi (2018) did a study on Effect of music on academic achievement of college students. The aim of the study was to determine the influence of music on the academic achievements of college students. The study was taken among 80 college students. In the study opinions to the effect of music on studies and to attain results on whether it had a positive or negative feedback in their grades were analyzed through a questionnaire. The researchers conducted the survey online

through survey planet. From the results of the study, it was evident according to the researchers that music plays a major role in the academic achievement of college students. In the study results, 40.5% of the students listen to music while studying. Also in the study results, 64% of students who lack concentration while studying in silence tend to have an increased efficiency in studying with the music on. The study also concluded from the findings that music has an effective effect on relieving stress. According to the researchers, since the survey focused on college students, the study proves that students tend to listen to music to relieve them from stress and music also helps them to focus on their studies. This study aimed to find out whether high school students too could report an increase or decrease or neither in their concentration when they studied with Instrumental music.

Tatik (2017) did a paper on The Influence of Instrumental music and Relaxation towards Information Retrieval on Students. The study used quasi experimental research design. The research used 50 students of Kediri State Islamic Institute as its sample population. In the study 20 students were included in the control group and 30 students in the treatment group. In the study instrumental and relaxation music was played to the control group



for 30 minutes before a lecture session. The students in the treatment group then had their normal lecture for about one hour before being tested on their ability to recall the content that they learnt during the lecture. The researcher administered 10 questions to test the students in both the control and treatment group. The control group in the study went through their normal lecture for about one hour normally without prior listening to any music. The control group were then tested on content that they had learnt in the lecture via the ten questions that were set by the researcher. According to the researcher the scoring of the assessment was presented as 1 or 0. If the answer is true, that is, if the student answered correctly, the student was given a score of 1 on that specific question, hence the maximum score that any student could achieve in the test was 10. If the answer was false, that is, if the student answered incorrectly, then the student was awarded 0 on that specific question, which means the minimum score for any student in the test was 0. The study results revealed that there is a significant difference in retrieval ability between the group which is exposed to instrumental and relaxation (treated group) and group which is not (untreated group). Hence the study results concluded that instrumental and relaxation music had a significant effect on the ability to recall information (retrieval). Also in the study the researcher noted that the students in the treatment group had never been exposed to such technique of listening to music before attending to a lecture. In the study, some of the participants felt it was important to occasionally be exposed to this kind of treatment. Instrumental music too could aid in someone's achievement (Scott & Herring, 2018). During night studies the students are expected to keep quiet and concentrate all the while. Music is an integral part of human beings and especially teenagers who use music as a positive stimuli and a motivator for various reasons. Tatik (2017) timed his participants in his study such that they all listened to Instrumental music 30 minutes before their lecture while the researcher timed his students such that they studied with Instrumental music during the latter stages of night study. In Tatik (2017) all participants were timed at the same time (30 minutes before the lecture) while in this study the participants were timed differently during the night study period.

Duna (2015) did a study on the effects of background music on student focus. The researcher observed 61 students in three early childhood classes in a private Montessori school for six weeks. The children in the study were between ages 3 to 6 years. According to the researcher, in a Montessori early childhood classroom the children spend most of the morning practicing with hands-on learning materials, making independent choices and working at their own pace. According to the researcher the children in the school chosen for the study had daily exposure to music since they began learning at the school and were familiar with a variety of background music played during class time. It was not uncommon for background music to be played in the school during class. As noted by the researcher in the study, the teachers in the school generally kept the music turned on during work period, transitions and lunch time and turn it off during group activities and presentations. According to the study, those children who had been in the school for a year or

more were familiar with instruments, composers and cultural music. The learners who had been in the school for one year been exposed to a variety of background music and rhythm instruments. The oldest students in the school had lessons on the instruments of the orchestra, notes, reading music and some have had piano lessons. According to the study, the teachers reported that those learners who have been in the school for two or more years could often identify the composers and sometimes even the pieces of music that they heard. According to Duna (2015) a Montessori classroom is often designed as a sanctuary for learning where interruptions are avoided to allow the children consistent time for learning, facilitating focus and concentration. With this in mind the researcher outlined her study so as to be minimally invasive to the daily classroom routine of the learners. According to the researcher conditions of the study did not alter the daily routine of the learners other than the administration of questionnaires to students and teachers which were constructed to be simple and quickly answered to cause minimal distraction. The researcher collected data for 30 minutes in each class once every week during the morning work period. In the study, observations were made during mid-morning periods, between 9:30 and 10:30 am, when children practiced lessons with didactic learning materials. Observations took place at least an hour after class began to allow time for the class to settle into the daily routine. In the study, three observations in each class were done with soft, slow instrumental background music playing in the background while three observations in each class were done with no music playing in the background. The school where the study was carried out had a central music system that plays a variety of Instrumental music so the music was the same in all the classes. The music in each class could be turned on or off at the discretion of the researcher. The music used in the study of Duna (2015) was consistently instrumental, low volume and slow tempo. During observations, the researcher collected tallied data on learning behaviors such as, "touching material productively" or "touching material unproductively." As detailed by the researcher focused and non-focused behaviors were tallied during these observations. Focused behaviors included "looking at work," "touching work productively" and "completed work cycle." Unfocused behaviors included "looking around room", "touching work unproductively" and "wandering or fidgeting." These behaviors were tallied periodically over the 30 minute observation without duplicating observations. As explained by the researcher, if a child, for instance, sat looking around the room for 10 minutes then worked intently on a puzzle for 10 minutes, "looking around the room" was tallied once and "touching work productively" was tallied once. If a group of three children chatted among themselves "talking to neighbor" was tallied three times and not again until the conversation had ceased for a time and then started up again or until the group members had changed. According to the study, after each observation, the students answered the question, "How do you feel today?" Children chose from four emoticons representing the options "happy", "neutral", "sad" or "mad". Responses were then tallied on the observation form. According to the researcher, the children came to anticipate this question and often volunteered their emotional state without



being asked. Children occasionally reported an emotion contrary to their affect. The researcher noted that the true emotional state of the learners was clear as demonstrated in their expressions and interactions with others. In the study too, the teachers answered simple questionnaires reflecting their feelings about the morning's work period. They were able to fill these out quickly on the spot capturing their immediate reaction to the morning's success. Since all of the responses of the teachers were then tallied on the observation form. The researcher also reviewed teacher notes for indications of the morning's productivity such as new lessons introduced, lessons mastered or behavior issues. Generally, as noted by the researcher, during a class period that flowed smoothly the teacher was more apt to have given new lessons and noted mastered exercises. During more turbulent class periods there were fewer notes of any kind except for notes about behavior. The researcher also collected student responses on their emotional outlook, teacher responses on their opinion of the success of the work period and teacher notes on positive and negative significant events of the work period. The study results of Duna (2015) revealed more smiles in the learners when the learners worked with background music playing in the background than when they performed their tasks with no music. Focused behaviors like "looking at work," or "touching work productively averaged 23.3 occurrences per 30 minute observation with background music and averaged 9.1 occurrences/30 minutes without music. Unfocused behavior was higher when the learners worked without music and minimal when the learners worked with music. Results of teacher assessments and notes showed more productive work period on the days that background music played, even though there was a 7% increase in restlessness among the learners. Student assessments in the study also reflected increased happiness and decreased neutral, sad and mad moods on days that the learners performed their tasks with Instrumental music. The study concluded that positive effect of background music on student focus. The researcher recommended that future studies could examine the effects on different age groups by using the same type, volume and tempo of music with toddler, elementary aged children and high school or college students which was a focus of this present study that looked at the effect of Instrumental music on academic achievement of high school students in Rongo Sub county in Kenya. Duna (2015) introduced the music stimulus during the mid- mornings between 9.30 am to 10.30 am for children between ages 3 to 6 years while the current study introduced the music stimulus for students aged 15 to 20 years during evening night study between 8 pm to 9.30 pm.

Furthermore, this objective specifically went further and found out which category of students benefitted the most from studying with Instrumental music given the timing at which the music stimulus was introduced during their night study time. The timing was either in the middle of the night study or during the latter stages of night study.

RESEARCH OBJECTIVE AND HYPOTHESIS

The study adopted the following objective and hypothesis:

To determine the effect of timing of playing Instrumental music on academic achievement in Physics.

H01: There is no significant difference in academic achievement of students who study with Instrumental music at different times during night study and those who do not.

THEORETICAL FRAMEWORK

This study was anchored on Martin E.P. 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 understanding 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 such 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.

METHODOLOGY

The study deployed Quasi- experimental research design. Purposive sampling was used to sample one school which had a relatively larger population of students taking Physics in Rongo Sub County. Forty Five students formed the sample in this study. The student sample was then split into three groups; fifteen students formed the control group while the other 30 students formed the experimental group. The same pre- test was administered to the sampled student population to determine their academic entry behavior. A pre-test as the initial measurement taken before an experimental treatment is administered and the subsequent score recorded (Stratton, 2019). In this study a pre-test was administered to both the control group and experimental group, marked and scores recorded. The pre- test covered topics in Form Three. The results were then used to place the students in the study groups (Control & Experimental) so that both groups had more or less the same academic achievement behavior. Different experimental groups studied with Instrumental music at different stages of prep while the control group studied in silence. Both the control and the experimental groups studied had three study periods in a week for four weeks. The same post- test was administered to both groups at the end of the study. Post-test refers to the measurement taken after treatment is administered in



an experiment to compare with the pre-test results to determine any causal effect of the treatment or the experimental intervention (Stratton, 2019). Similarly, the post- test covered questions on topics in Form Three that were tested in the pre- test albeit different questions but of the same difficulty. The results of the post- test were then used to determine the effect music had on their academic achievement in Physics. Specifically, the quantitative data collected from the post-test was used to test the hypothesis that there is no significant difference in academic achievement of students who study with Instrumental music at different times during night study and those who do not. A questionnaire was administered to the students in the experimental groups to find out how they felt with regards to studying with Instrumental music during prep on domains such as effect on their concentration, ability to grasp concepts, if they feel they improve in their academic achievement when they study with Instrumental music, how easily they find it easy to study with Instrumental music and whether or not they feel like studying for longer period when Instrumental music is playing in the background. Qualitative results were analysed thematically while Quantitative test results were then analysed using mean and ANOVA.

RESULTS AND DISCUSSION

The objective of the study was to determine the effect of timing of playing Instrumental music on academic achievement

Table 1: Effect of timing of studying with Instrumental music for group T1

When I study with Instrumental music:	SA	A	D	SD
I am able to concentrate on what am studying	23.1	61.5	15.4	
I grasp/ understand concepts easily	23.1	69.2	7.7	
I improve in my Academic achievement	16.7	50.7	16.7	16.7
I find it easy to study	30.8	46.2	15.4	7.7
I enjoy studying	53.8	23.1	15.4	7.7
I want to study for longer	15.4	38.5	30.8	15.4

Table 1 details the responses of group T1 that studied with Instrumental music from around 8pm for 40 minutes for a total of three study periods in a week for four weeks on various aspects such as concentration and ease of studying with Instrumental music. From Table 1, 84.6% of the students in T1 agree that they are able to concentrate on their study material when they undertake their night study with Instrumental music playing in the background while 15.4% disagree. Furthermore 67.4% feel studying with Instrumental music makes them improve in their academic performance while 33.4% disagree. Moreover 92.3% agree that they can understand concepts easily when studying with Instrumental music while 76.9% enjoy studying with Instrumental music. As displayed in Table 1, 77% agree that they find it easy to study with Instrumental music while 23.1% disagree. When it came to whether or not the students in T1 felt that Instrumental music made them want to study Physics for longer, 53.9% agreed while 46.2% disagreed.

In this study 84.6% of the students in T1 agreed that they are able to concentrate on their study material when they undertake their night study with Instrumental music playing in the background which aligns with the findings of Monica et al.

in Physics. For this objective the control group (T3) was made to study Physics in silence for 40 minutes from around 8.00pm for three study periods in a week for four weeks. The first experimental group (T1) was made to study Physics with Instrumental music for 40 minutes from around 8.00pm for three study periods in a week for four weeks. The second experimental group (T2) was made to study Physics with Instrumental music for 40 minutes from around 8.40pm for three study periods in a week for four weeks. Therefore all groups had a total of 12 study periods. After the study period, a questionnaire was administered to the students in group T1 and T2 to find out how they felt with regards to studying at different times with Instrumental music on domains such as effect on of studying with Instrumental music on their concentration, ability to grasp concepts, if they feel they improve in their academic achievement, how easily they find it easy to study with Instrumental music and whether or not they feel like studying for longer period when Instrumental music is playing in the background. Also after the four weeks a questionnaire was administered to all the students in the groups. After the study duration, a test was administered to the groups and then marked (post- test) to. Table 1 displays effect of timing of studying with Instrumental music for group T1 on various domain aspects measured on a four range Linkert scale of STRONGLY AGREE (SA), AGREE (A), DISAGREE (D) and STRONGLY DISAGREE (SD).

(2018). Monica et al. (2018) looked at effect of music on academic achievement of college students. In their study, through questionnaires administered online to the students, 64% of students who lacked concentration while studying in silence reported that they had an increased efficiency in studying with the music on. To support this, one of the students in T1, when responding to why he preferred to study with Instrumental music always stated:

This is because every time I study with Instrumental music

I easily understand and remember whatever I have read. (Case No. 33)

To further support this, another student stated in his questionnaire:

*Sometimes when my concentration span is low,
I will prefer an Instrumental Physics class to increase my concentration. (Case No. 5)*

While this study explored effect of music studying depending on what time Instrumental music stimulus is introduced during night study time, the study of Monica et al.



(2018) did not filter or specify the timing of study. Nonetheless, 84.6% of the students who studied with Instrumental music from 8pm to 8.40 pm in this study reported that they were able to concentrate on their study material which aligns with the findings of Monica et al. (2018). Moreover 92.3% of the students in T1 agree that they can understand concepts easily when studying with Instrumental music and 67.4% feel studying with Instrumental music makes them improve in their academic performance which supports Tatik's (2017) study results. Tatik (2017) looked at influence of instrumental and relaxation music towards information retrieval on students. In his study instrumental and relaxation music was played to the control group for 30 minutes before a lecture and then the students had their normal lecture for about one hour before being tested on their ability to recall the content that they had learnt. The control group

had their lecture as usual. Tatik (2017) results revealed that there is better retrieval ability in the group which is exposed to instrumental and relaxation music than the group which is not (untreated group). Tatik (2017) concluded that instrumental and relaxation music had a significant positive effect on the ability to recall information. Even though Tatik (2017) introduced Instrumental music stimulus before the lecture period while this study introduced the Instrumental music stimulus during the studying time, both of study results reported positive effects of Instrumental music in the learning of Physics.

Table 2 displays effect of timing of studying with Instrumental music for group T2 on various domain aspects measured on a four range Linkert scale of STRONGLY AGREE (SA), AGREE (A), DISAGREE (D) and STRONGLY DISAGREE (SD).

Table 2: Effect of timing of studying with Instrumental music for group T2

When I study with Instrumental music:	SA	A	D	SD
I am able to concentrate on what am studying	76.9	23.1		
I grasp/ understand concepts easily	61.5	38.5		
I improve in my Academic achievement	38.5	46.2	15.4	
I find it easy to study	84.6	15.4		
I enjoy studying	84.6	15.4		
I want to study for longer	50.0	50.0		

Table 2 details the responses of group T2 that studied with Instrumental music from around 8.40pm for 40 minutes for a total of three study periods in a week for four weeks on various aspects such as concentration and ease of studying with Instrumental music. From Table 2, 100% of the students in T1 agree that they are able to concentrate on their study material when they undertake their night study with Instrumental music playing in the background while 81.3% feel studying with Instrumental music makes them improve in their academic performance. Moreover 100% agree that they can understand concepts easily when studying with Instrumental. One hundred percent of the students also enjoy studying with Instrumental music and feel that Instrumental music make them want to study for longer periods. This finding avers with the findings of Duna (2015). Duna (2015) noted that there were more smiles in the learners when the learners worked with background music playing in the background than when they performed their tasks with no music. In Duna (2015) children between ages 3 to 6 years were observed for about 30 minutes between 9.30 am to 10.30 am in their regular setting as their underwent their regular learning activities under two conditions; Instrumental music playing in the classroom and in silence condition. Duna (2015) reported that focused behaviors

like "looking at work," or "touching work productively averaged 23.3 occurrences per 30 minute observation with background music and averaged 9.1 occurrences/30 minutes without music. Also in Duna (2015) unfocused behavior was higher when the learners worked without music and minimal when the learners worked with music. The participants in this study were aged between 15 to 20 years while the participants in Duna (2015) were aged 3 to 6 years, yet both studies reported similar results. In this study, 100% of the learners found it easy to study with Instrumental music playing in the background which aligns with the findings of Duna (2015). To support this, one of the students in T2 stated in his questionnaire that:

*Instrumental music always made my brain relaxed
and I was able to study Physics
and grab the content faster. (Case No. 48)*

The three groups (T1, T2, and T3) were also subjected to a post-test after the study period. The post- tests were then marked and marks recorded. Table 3 shows the marks posted by the various groups.



Table 3: Results for Groups T1, T2, T3

GROUP	T1		T2		T3	
Student sample No	PRE TEST	POST TEST	PRE TEST	POST TEST	PRE TEST	POST TEST
1.	73	41	66	66	66	77
2.	64	43	65	47	65	39
3	56	36	55	41	55	41
4.	51	33	53	34	55	51
5.	49	36	49	44	49	24
6.	48	43	48	46	48	51
7.	44	41	44	29	43	56
8.	41	29	43	44	43	11
9.	39	41	39	34	38	36
10.	38	40	38	27	38	35
11.	35	34	35	19	35	29
12.	33	37	34	24	34	26
13.	29	10	28	23	28	20
14.	25	23	26	16	28	36
15.	29	14	21	22	21	34
MEAN	43.6%	33.4%	42.93%	31.0%	43.06%	37.73%

From Table 3, T1 had a mean of 43.6% in the pre-test and a mean of 33.4% in the post- test, T2 had a mean of 42.93% in the pre-test and a mean of 31.0% in the post- test while T3 had a mean of 43.06% in the pre- test and 37.73% in the post- test. T1 dropped with a percentage of 10.2%, T2 dropped with a percentage of 8.53% while T3 dropped with a percentage of 5.33% in their post-tests respectively. The drop in all the groups was probably due to the level of difficulty of the post test questions which were harder than the questions in the pre- test.

The three groups were also subjected to a t-test to test whether the difference in means in the pre- test and post- test was significant.

For T1 at $\alpha = .10$, $df = 28$, $C_v = 1.701$, the test statistic $t = 2.327$. Consequently $2.327 > 1.701$ hence the null hypothesis is

rejected. Therefore the two means are significantly different for T1.

For T2 at $\alpha = .10$, $df = 28$, $C_v = 1.701$, the test statistic $t = 1.735$. Consequently $1.735 > 1.701$ hence the null hypothesis is rejected. Therefore the two means are significantly different for T2

For T3 at $\alpha = .10$, $df = 28$, $C_v = 1.701$, the test statistic $t = .9273$. Consequently $.9273 < 1.701$ hence the null hypotheses is retained. Therefore the two means are NOT significantly different for T3

The researcher conducted ANOVA for T1,T2 and T3 to test the hypothesis; There is no significant difference in achievement of students who study with Instrumental music at different times during night study and those who do not. Table 4 details the ANOVA table

Table 4: ANOVA Summary Table for T1, T2, T3

Source of Variation	Degrees of freedom(df)	Sum of Squares	Mean Square	F value
Between	2	107.7778	53.889	$F = \frac{53.889}{202.337} = .2663$
Within	42	8498.1333	202.337	
Total	44	8605.9111	256.226	

At $\alpha = .05$, $C_v = 3.22$ the test statistic $F = .2663$ is less than the critical value of $F = 3.22$. Consequently the Null Hypothesis was retained hence There is no significant difference in achievement of students who study with Instrumental music at different times during night study and those who do not. Even though there is no significant difference in the means, the experimental group that studied with Instrumental music during the later stage of night study performed better than the Experimental group that studied with Instrumental music during

the middle of night study. A student therefore is likely to benefit more if he or she studies with Instrumental music during the later stages of night study. According to Monica et al. (2018) 64% of students who lack concentration while studying in silence tend to have efficiency in studying with Music on. The researcher of this current study further filtered results for student responses for T2 (Group that studied with Instrumental music for the latter stages of night study from 8.40 p.m. for 40 minutes) on the domain ' I am able to concentrate on what I am studying' and all the students



of T2 either strongly agreed or agreed that they were able to concentrate with 76.9% strongly agreeing. The findings of this study therefore seem to suggest a beneficial effect on concentration levels of students when students study with Instrumental music during the latter stages of night study when they are likely to suffer from mental fatigue as a result of sitting in class for a longer period of time. As noted earlier in this there is no significant difference in achievement of students who study with Instrumental music at different times during night study and those who do not which suggest that the students in the groups did not have significant difference in their ability to focus on their study material. This is in contrast to the study by Duna (2015) where children showed significant greater focus on tasks in the presence of background music. However, it seems high school learners are able to focus on the task at hand regardless of time which does not necessarily depend on the presence or absence of music stimuli.

CONCLUSION

The objective of the study was to determine the effect of timing when to play Instrumental music on academic achievement in Physics. Specifically the researcher predicted that there would be no significant difference in achievement of students who study with Instrumental music at different times during night study and those who do not. At $\alpha = .05$, $C_v = 3.22$ the test statistic F was calculated to be .2663 ($F = .2663$) which is less than the critical value of $F = 3.22$. Consequently the Null Hypothesis was retained inferring that there is no significant difference in achievement of students who study with Instrumental music at different times during night study and those who do not.

Recommendations

The study determined that Instrumental music has the same effect on academic achievement in Physics regardless of what time one decides to study with Instrumental music. Students of Koderu Bara High School may hence study with or without Instrumental Music depending on their preference at any stage during their prep study.

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