SCHOOL TIMETABLE PERIOD/TIME OF INSTRUCTION AND ACADEMIC ACHIEVEMENT OF STUDENTS IN SENIOR SCHOOL BIOLOGY

By

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Abstract

The study investigated, using quasi-experimental research design, whether period/time slot in the school timetable significantly affects academic achievement of students in senior school biology in Delta State Capital Territory. The study involved six randomly selected senior secondary school, three schools each were randomly assigned to experimental and control groups. The sample comprised 110 senior school 2 (SS2) students, out which 60 and 50 students were in experimental and control groups, respectively. The experimental group had lessons in the afternoon hours/periods, while the control group had lessons in the morning hours/periods. The instrument tagged "Biology students test questions" (BSTQ) was used in testing the students achievement before and after treatment. Z-test was used in analyzing the data. The result obtained from the analysis revealed that there was no significant difference between the mean scores of the experimental and the control groups. Implications of the finding were discussed and recommendation made to improve reaching and learning.

It is a common knowledge that science teachers, often, prefer science instruction to take place during the morning period (Igbojinwaekwu,2004). He posited that, a survey of secondary and primary schools in Delta state confirmed that school administrators have accepted this condition. That is, science instructions are carried out in the morning periods/ while languages, arts and social science subjects are taught either in the mid days or in the afternoons. This has been the practice in Delta State secondary and primary schools. According to Igbojinwaekwu, Kpeke and Asuka (2009), it is also a known fact that throughout the course of study of students in faculties of education in Nigeria universities, no aspect of principles of instruction/teaching has specifically stated specific period(s) or time for science instruction. Igbojinwaekwu (2009), stated that in the guide-line for teaching practice for undergraduates and students in the colleges of education, no student teacher has been instructed to teach science in the morning periods only.

According to Igbojinwaekwu (2010), under normal conditions, the functions of a school time table are to:

i. remind the teacher of his/her time of teaching,
ii. make the teacher know his/her number of periods per week,
iii. remind the teacher that his/her teaching has time frame and must be strictly followed.
iv. ensure orderly presentation of instruction,
v. show the teacher and the student where the instruction is taking place and
vi. enable the students plan ahead in terms of number and type of books to take to the school.

Supporting the functions of the timetable mentioned above, Obanya (1985) concluded that school timetable controls four elements in the school system; the elements are the teachers, students, time slots/periods and classrooms.

A careful study of the examination time-table for senior school certificate examinations (WAEC, 2009; NECO, 2009), showed that senior secondary school students were made to write their examinations in science and mathematics subjects in both morning and afternoon hours. It is a common practice that secondary & primary school examination time-tables are made in such a way that science and mathematics are written in morning hours/periods, while languages, arts and social science subjects are written in the afternoon periods/hours. It is a common practice, also, to see students reading science and mathematics in both morning and afternoon hours when preparing for examinations or even at lessons.

The reasons advanced by some science teachers and even other teachers for teaching science subjects in the morning periods were that

i. Students are more relaxed in the morning periods than the afternoon periods,
ii. Students learn more when they are relaxed than when they are not,
ii. Science concepts need high level of concentration to understand and it is only in a relaxed condition that this is achieved,
iii. afternoon periods are too hot and noisy for science students to learn,
v- Students are already thinking about going home, complaining of being tired and in most cases, sneaking out of the classroom in the afternoon periods, because these periods (l.QQpm-2.QGpm) are close to the closing time (2.30pm).

The aforementioned reasons are strictly public opinions and psychological, because there are no empirical findings to buttress them. In principles of instruction, teaching-learning process is enhanced by the teacher and learner factors (Okoye, 1998; Obanya, 1980), instructional materials factor (Gbodi and Laleye, 2006; Alio, Ude and Okoye, 2009), class size factor (Okoye,1998;Obanya,1985), teaching techniques/strate gies factor (Akuezuilo and Chinweoke, 2009; Okigbo and Akusoba, 2009; Offiah and Akusoba, 2009;Anyamane and Anyachebelu,2QQ9;Esomonu,2009) and teaching methods factor (Okeke, 1986; Qbanya, 1980; Oyegwe, 1998; Kpangban and Onwuegbu, 1992). Okoye (1998) and Obanya (1985), argued that when a teacher presents his lesson in an interesting way, no matter the period/hour of instruction, students will pay great attention. They, therefore, concluded that a good teacher can always attract his/her students attention no matter the period/hour of instruction. Supporting Okoye (1998) and Obanya (1985), Omoifo and Okebukola (1994), stated that a good teacher with pedagogical content knowledge (PCK) knows how topics and instructions are related and therefore stand a better chance of making science and mathematics easily accessible to students either in the morning hours/periods or afternoon hours/periods; they posited that a good teacher who knows his/her students has no fears in teaching either science or mathematical subjects in the mornings or afternoons.

Statement of the Problem

Timetable is an important document in every school system. Without this vital document, there will be confusion with regard to order of instructions in the schools. As important as this document seem to be, no study has linked it to students' performance/achievement in any subject It is this singular factor that triggered the interest of the researcher in this study. The problem of this study, therefore, is posed as a question: has period/hour of instruction any significant effect on academic achievement of students in senior school biology, in Delta state capital territory?

Purpose of the Study

The purpose of this study is to find out whether the school period/time slot in the school timetable significantly affects the academic achievement of students in senior school science. Specifically, the study sought to ascertain if period/hour of instruction in the school timetable affects academic achievement of students in senior school biology.

Null Hypothesis

There is no significant difference between the mean scores (MS) of the students instructed in the morning periods and their counterparts instructed in the afternoon periods in senior school biology.

Methodology

The study employed quasi-experimental research design (pretest-posttest control group design), Six senior secondary schools out of twelve senior secondary schools in Delta state capital Territory were randomly selected. Three schools each were randomly assigned to experimental and control groups. The experimental group consisted of senior secondary schools that taught biology in the afternoon periods, while the control group comprised the schools that taught biology in the morning periods. Before the commencement of first term's 2009/2010 academic work, the researcher visited the principals of the three schools in the experimental group and arranged for biology to be allocated periods in the afternoon hours in their timetables. The schools in the control group had lessons in the morning periods. Teachers with the same teaching experience and who are degree (B. Sc. Ed.) holders in biology taught the students. Uniform lesson notes were prepared by the researcher and given to the teachers to teach their lessons to both the experimental and control groups for four weeks. The researcher organized a training programme for the teachers used in this study; the teachers were instructed to adhere strictly to the lesson notes prepared by the researcher. In the six senior secondary schools used in this study, there were 2,620 senior school two (SS2) students, out of which 1,465 SS2 students were in the experimental group, while 1,155 SS2 students were in the control group. The sample used in this study was 110 SS2 students, which comprised 60 SS2 students for experimental and 50 SS2 students for control groups. The samples for experimental and control groups were obtained by proportionate random sampling technique after a pretest administration on the entire SS2 students.

The instrument for data collection was Biology Students Test Questions (BSTQ). The instrument was researcher's made. The BSTQ consisted of twenty Biology objective questions covering the skeletal system of man, drawn from past WAEC objective question papers.

The instrument (BSTQ) was validated by two science education experts. The Kunder-Richardson 21 (K-R21) estimate was used to determine the reliability index of BSTQ as 0,94. According to Egbule and Okobiah (2001), reliability co-efficient of between 0.50 and 1,00 is considered adequate for an instrument to be accepted as reliable for research undertaking. Also, Maduabum (2004), opined that research instrument with reliability co-efficient of 0.90 and above is considered adequate for researches in academic achievements. Therefore, the reliability index of 0.94 was regarded as very reliable for BSTQ

The BSTQ was used to pre-test students in both experimental and control groups, before any treatment was made on the experimental group. Both experimental and control groups were pre-tested in the morning period/hour, before the commencement of instruction/ teaching, BSTQ was also used to post-test both groups of students at the end of instruction.

The experimental group was post-tested in the afternoon period, while the control group was post-tested in the morning period. The scores of students' pre-test and post-test were obtained from BSTQ. The students' scores, who were not selected in the samples used in the study, were ignored.

The mean scores (MS) and standard deviations (SD) of the pretested students in both the experimental and control groups were computed and compared using z-test in a two-tailed test at 0.05 level of significance, in order to know their academic standing. Similarly, the mean scores (MS) and the standard deviations (SD) of the scores of the post tested students in both experimental and control groups were calculated and compared using z-test in a two tailed test at 0.05 level of significance to test the only hypothesis guiding this study, since two means were compared (Owie, 1996; Nworgu, 1991; Olaitan, Ali, Eyoh and Sowande, 2000) and, the sample was large (3Q)(Ali,1998).

Results

The results of this study are summarized in tables 1 and *2,*

Table: z-Test of Pre-tested Mean Scores (Ms) for the Experimental and Control Groups in Senior School Biology

Group	N	MS(%)	SD(%)	df	Z_{cal}	Zcrit	P
Experimental	6	58	9.8				
1	0			10	15	1.9	<0.0
				8	0	6	5
Control	50	55	9.0				

Table 1 shows that $Z_{cal} < Z_{crit}$ at 0.05 level of significance and 310 df in a two-tailed test. This indicated that the pretested mean scores are not significantly different, although the experimental group had a mean score of 3% higher than the mean score of the control group- Another implication of this result is that the experimental and control groups, in this study, are comparable.

The only hypothesis in this study was tested as shown in table 2.

HOI: There is no significant difference in the mean scores (MS) between the students instructed in the morning periods and their counterparts instructed in the afternoon periods in the senior school biology.

Table 2: Z-test of Post-Tested Mean Scores (MS) for Experimental and Control Groups in Senior School Biology

Group	N	MS (%)	SD(%)	df	Z_{cal}	Z_{crit}	P
Experiment al	60	69.8	9.5	108	1.7	1.96	<0.05
Control	50	71.9	9.4		4		

Table 2 shows that $Z_{ra} < Z_{crit}$, at 0.05 level of significance and 108 df in a two- tailed test. The implication is that the H_0i is retained. That is, biology instruction can take place at any period

{afternoon or morning), since it does not affect the academic achievement of students. This further shows that the difference in the mean score of 2.1% in favour of the control group is not significant.

Discussion

The findings in this study showed that at both pretest and posttest, the mean scores of both experimental and control groups in senior school biology were not significantly different. These observations agree with Obanya (1985) and Omoifo & Okebukola (1994) who opined that teaching science subjects in the morning hours/ periods is merely psychological and not empirical, It is also in agreement with Akuezuilo and Chinweoke (2009), Obanya (1980) and Offiah and Akusoba (2009), who stated that in principle of instruction/ teaching, period of instruction is not a factor affecting academic achievement of students, but teaching methods and strategies.

Further findings in this study showed that at the pre-test stage, the mean score of the experimental group was higher than the mean score of the control group, while in the post-test stage, the mean score of the control group was higher than the mean score of the experimental group. This implied that the higher mean score of one group at a particular time might be accidental and definitely not because of the period of instruction or teaching.

Conclusion

The experimental group had a lower mean score (MS) of 69.8% than the control group that had higher mean score (MS) of 71.9% at the post-test stage; the difference in MS between the experimental and the control groups was not statistically significant in the senior school biology.

This implied that science instruction or teaching can be made at any time or period. Science teachers should rely more on good teaching methods and strategies for their excellent teachings-It is, therefore, recommended that periods/hours of instruction in secondary schools should be evenly distributed among science, and other social science teachers. Science instruction should no longer take place only in morning hours/ periods under the cover that students are more relaxed in the morning hours than in the afternoon periods/hours. Student teachers and practicing teachers should be taught the relationship between topics and strategies of teaching science, so that students should have little or no difficulty in understanding lessons taught.

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