DOES STUDENTS' CLASS ACTIVITY INDICATE THEIR ACADEMIC ACHIEVEMENT?

Ademe Mekonnen and
G/Meskel G/Eyesus*

Abstract

A study was undertaken on selected sections of the Tana Haik Comprehensive Secondary School during the first semester of the 1980 (E.C.) academic year to determine the relationship that may exist between students' class activity and the their academic achievement in mathematics. Students' semester results were compared with their class activity. In all study sections, no association existed in the proportion of passes (those scoring fifty percent and above) between the active and passive students. There was no significant mean score difference between the active and the passive in grades nine and eleven. A significant mean score difference between the two groups was however observed in grade ten. An analysis of the sex distribution revealed no association between class activity and sex in all the study sections except in grade ten.

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*Mr. Ademe Mekonnen is a Lecturer at Bahir Dar Teachers' College, Addis ababa University and Mr. G/Meskel G/Eyesus was a student of Mr. Ademe.

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INTRODUCTION

Today, Government and the entire community are pouring a substantial amount of money to finance the schools. Since money and material resources are in short supply in countries like Ethiopia, the fact that they are properly utilized to promote the students' academic achievement is a matter of great concern. This calls for intensive research in the area of academic achievement which will greatly increase the effectiveness of teachers and educators in their teaching and guidance. Unfortunately studies on this subject are scanty in Ethiopia.

It will not be an easy task to bring together all the factors that bring about variabilities in academic achievement in a single paper like this one. This paper analyzes whether students' class activity (measured according to the feed back students give during class hours) is related to their academic achievement in mathematics. In view of the foregoing discussion, we report here a study under-taken at Tana Haik Comprehensive Secondary School situated in Bahir-Dar Town, with a population of 4155 students and 88 teachers.

MATERIALS AND METHODS

The study population consisted of the three levels (grades nine, ten and eleven) of the Tana Haik Comprehensive Secondary School. There were 19 sections in grade nine, 17 sections in grade ten and 10 sections in grade eleven. From each level, a section was selected by simple randam sampling. There were 82, 73 and 67 students in the study sections

of grades 9, 10 and 11 respectively. Grade 12 was excluded from this study due to inconveniences created by the Ethiopian School Leaving Certificate Examination (E.S.L.C.E.).

The sampled sections were observed for ten mathematics class hours distributed throughout the first semester of the 1980 (E.C.) academic year. During observation hours the active and the passive students were identified. For the purpose of this study, a student was active if he/she raised his/her hand to ask or answer a question at least five times during the ten observation hours. Students in the study sections were arranged in seats so that they assumed permanent positions throughout the semester. The sitting pattern together with the student's name was copied on a specially prepared form and each hand raise was carefully marked in this form on the right position. Since the behaviors studied (responding and asking questions) were legitmate and appropriate, there was hardly any complication in recording them. The two researchers were positioned in the rear seats and observed half the class each. To minimize underestimation of scores, the teacher, while picking the hands, cooperated with the researchers by allowing enough time for recording the scores. Great care was taken so that students remain ignorant of the purpose of the study for any such knowledge would provoke unwanted hand raises. The results of the first semester mathematics examinations were finally collected from the instructors' grade reports. Comparision of the results of the active and the passive students was made.

The Chi-square and z-tests were employed for statistical analysis. For all tests decisions were made at the level of significance 0.01.

RESULTS

Classroom observation was made on 80 students of grade nine, 73 students of grade ten and 67 students of grade eleven of the Tana Haik Comprehensive Secondary School for a period of ten hours distributed throughout the first semester of the 1980 academic year. Of the 80 students in grade nine there were 34 (42.5%) passes (scored 50% and above), of the 73 students in grade ten there were 55 (75.38) passes and of the 67 students in grade eleven there were 30 (44.8%) passes in the first semester mathematics examination (Tables I, II and III). Of those observed in grade nine, 37 were active while 43 were passive; 20 (54%) of the active and 14 (32.6%) of the passive students passed the examination. In grade ten, there were 32 active and 41 passive students; 28 (87.5%) of the active and 27 (65.9%) of the passive succeeded in passing the examination. In the study group of grade eleven, there were 28 active and 39 passive students; 16 (57.1%) of the active and 14 (35.9%) of the passive passed the examination. When proportions of passes between the active and passive students in grades nine, ten and eleven were examined the differences were not statistically significant ($p > 0.01$).

TABLE I

Distribution of sampled grade nine students of the
Tana Haik Comprehensive Secondary School
according to their academic achievement

Result	CLASS ACTIVITY Active	Passive	Total
Pass (50% and above)	20 (54.0)	14 (32.6)	34 (42.5)
Fail (below 50%	17 (46.0)	29 (67.4)	46 (57.5)
Total	37 (100)	43 (100)	80 (100)

The difference between passive and active passes was not significant, $x^2 = 3.81$, $p > 0.01$.

N.B.
Figures in parenthesis indicate percentages.

TABLE II

Distribution of sampled grade ten students of the
Tana Haik Comprehensive Secondary School
according to their academic achievement

	CLASS ACTIVITY		
Result	Active	Passive	Total
50% and above	28 (87.5)	27 (65.9)	55 (75.3)
Below 50%	4 (12.5)	14 (34.1)	18 (24.7)
Total	32 (100)	41 (100)	73 (100)

Passive Vs active passes not significant, $x^2 = 4.53$, $p > 0.01$.

N.B.
    Figures in parenthesis indicate percentages.

TABLE III

Distribution of samples grade eleven students of the
Tana Haik Comprehensive Secondary School
according to their academic achievement

	CLASS ACTIVITY		
Result	Active	Passive	Total
50% and above	16 (57.1)	14 (35.9)	30 (44.8)
Below 50%	12 (42.9)	25 (64.1)	37 (55.2)
Total	28 (100)	39 (100)	67 (100)

Passive Vs active passes not significant,
$x^2 = 2.97$ p > 0.01.

N.B

Figures in parenthesis indicate percentages.

The range of scores of the active students were
35-89% for grade nine, 39-84% for grade ten and 26-90%
for grade eleven, and that of the passive were 29-78%
for grade nine, 38-68% for grade ten and 24-88% for
grade eleven. The mean scores of the active students
were 53.7, 59.4, and 52.7 for grade 9, 10 and 11 re-
spectively while the mean scores of the passive

students were 47.5, 53.5 and 47 for grades 9, 10 and 11 respectively (Table IV). Differences in the mean scores of the active and passive students in grades nine and eleven were not statistically significant (p >0.01). The difference in the mean scores was however significant for grade ten (z = 2.58, p<0.01).

Table V presents sex distribution of the active and passive students. Male students were higher in number in the study groups (Male/Female ratio was 122/100 for grade nine, 170/100 for grade ten and 219/100 for grade eleven). No significant difference in class activity existed between males and females in grades nine and eleven (p >0.01). A significant difference in class activity was however observed between male and female students of grade ten (x^2=8.14, p <0.01.) The schools student-teacher ratio and average class size were 377:1 and 78 respectively.

TABLE IV

Distribution of the active and passive students
for grades 9, 10 and 11 of the Tana Haik Comprehensive
Secondary School according to their achievement

Result (100%)	Grade Nine Active N= 37	Passive N= 43	Grade Ten Active N= 32	Passive N= 41	Grade Eleven Active N= 28	Passive N= 39
0 - 9	-	-	-	-	-	-
10 - 19	-	-	-	-	-	-
20 - 29	-	1	-	-	1	2
30 - 39	5	6	1	3	5	4
40 - 49	12	22	3	11	6	19
50 - 59	10	9	8	15	11	12
60 - 69	4	3	13	12	-	1
70 - 79	3	2	5	-	2	-
80 - 89	3	-	1	-	2	-
90 - 99	-	-	-	-	1	-
MEAN SCORE	53.7	47.5	59.4	53.3	52.7	47.1
STANDARD DEVIATION	14.2	10.2	10.6	9.2	16.5	10.3

*Active Vs passive not significant for grades 9 and
11, $p > 0.01$.

Active Vs passive significant for grade 10, $p < 0.01$.

TABLE V

Sex distribution of the active and passive students
for grades 9, 10 and 11

Class* activity	GRADE NINE			GRADE TEN			GRADE ELEVEN			TOTAL	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Active	23 (52.3)	14 (38.9)	37 (46.3)	26 (56.5)	6 (22.2)	32 (43.8)	22 (47.8)	6 (28.6)	28 (28.6)	71 (52.2)	26 (31.0)
Passive	21 (43.7)	22 (61.1)	43 (53.7)	20 (43.5)	21 (77.8)	41 (56.2)	24 (52.2)	15 (71.4)	39 (58.2)	65 (47.8)	58 (69.0)
Total	44 (100)	36 (100)	80 (100)	46 (100)	27 (100)	73 (100)	46 (100)	21 (100)	67 (100)	136 (100)	84 (100)

*Male Vs female not significant for grade 9 and 11, $p > 0.01$.

Male Vs female significant for grade 10, $p < 0.01$.

DISCUSSION

Researchers in the field of education have only recently began to study the interactive behavior of teachers and students in the class-room. One of the primary concerns of these researchers have been the determination of the relationship between students' class-room participation and their acaddemic achievement. It is generally claimed that classrooms in which there is a large percentage of question asking, students responding and teachers reinforcing have significantly greater achievements than classrooms in which these conditions are present to a lesser extent (1). Nevertheless, the results of this study indicated that no significant difference existed in the proportion of passes (those scoring 50% and above) between the active and passive students in grades nine, ten and eleven. Similarly an analysis of the mean scores between the active and passive students in grades nine and eleven did not reveal significant differences. A significant mean score difference was however observed in grade ten. We have here a situation of mixed results which makes interpretation of data rather difficult. Similar observations of mixed results and the difficulty in analysing them have been documented elsewhere (2).

Not withstanding that some mixed results were observed, the general trend of this study underlined the absence of substantial relationship between class activity and academic achievement. Whereas one would expect that class activity that encourages students to seek explanations, to reason and to solve problems would be consistently related to academic achievement, the non-significant results are quite puzzling. Concerning this several authors (3,4,5) argue that class

participation of students though necessary, is obviously not enough to ensure the attainment of educational goals. In addition to merely being there the participants must attend in a more profound fashion. They must look and listen to the objects of their lessons. They must selectively perceive the world of the classroom and become involved wholeheartedly in their school work. The authors further contend that the signs of overt attaintion and participation are not always trustworthy indicators of the pupils actual state of mind. All eyes on the teacher does not necessarily mean all thoughts on the topic at hand and the teacher who is intrigued by this is likely to end up achieving only a kind of surface confirmity to his demands. Regarding the passive students, the authors explain that these students may be involved in an intense intellectual activity bearing on the topic at hand. Some may be relating what they have just heard to previous knowledge, others may be evaluating the general worth and future usefulness of what they have just learned. They may become so immersed in these tangential but highly relevant thoughts that they may stop even listening, for a time, to what is being said. This type of passivity and inattention needs to be encouraged and is obviously very different from that which involves thoughts about completely irrelevant matters.

From the foregoing, it is clear that learning and academic achievement are brought about as a result of the students' inner activity and intellectual involvement and that such behaviors may not necessarily be displayed interms of visible activity. Presumably a student may be visibly active in class but that may not necessarily make him an above achiever just as a passive student may not necessarily be an under-

achiever. Of course, one can not deny the fact that
class participation gives life and vitality to a suc-
cessful instruction. It saves the class from boredom
by giving humor to the lesson, and this can be attain-
ed if the concerned instructors give the class their
full acceptance and encouragement. After all positive
reinforcement may be seen in the classroom in the
form of reward, praise, encouragement, acceptance
and clarification of ideas and these things initiate
the students to participate openly in class (1,6).
However, it would be unwise for instructors to take
class activity as a sure sign of learning and achieve-
ment.

Writing on the conditions of learning an educ-
ational theories (7) suggests that in order for in-
struction to be effective, the learner must first
of all participate in the instructional situation.
It is not sufficient for him simply to be present
as a body. He must be motivated to acquire the ca-
pability of accomplishing something. Then too, he
must attend to the stimulation provided by instruct-
ion if it is to have any effect on his learning. Be-
cause much of instruction for the human learner takes
the form of symbolic communication he must be set
to perceive and comprehend such communications ra-
ther than simply hear them as patterns of sounds.
fo expert concludes that instructors should make
fue that their students acquire all of these cha-
csnᵍeristics if they want to enhance learning and
ᴊoᴜ levement.

Furthermore, other potentially influential va-
bles such as textbooks and supplementary materials,
anization of the lesson and sequencing of the ma-
bnbials, the cognitive learning styles of individual
pupils, and the influence of the entire school en-

vironment may have profound effects upon academic achievement (8). In particular, the student-teacher ratio and average class sizes are worth considering. It was observed from the results of our study that student-teacher ratio and average class size were 377: 1 and 78 respectively for the entire school. Such crowded classroom conditions reduce the teacher's options of style of teaching and restricts him to formal lecture methods. Furthermore these figures are so staggering that such useful activities as the assigning and checking of homework exercises (which have been found to have a strong correlation with academic achievement (9) would not be possible. In light of this the researchers suggest that the concerned authorities should search for optimal solutions concerning student - teacher ratio and average class sizes.

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