Effect Of Visual Information Aids On Secondary School Achievement Of Civic Education In Enugu Metropolis.

Dr (Mrs.) Anukaenyi Blessing
Department of Education foundations
Godfrey Okoye university, Enugu
08033749323
Blessinganukaenyi@gmail.com
And
Dr. (Mrs.) Veronica Mogbo
Department of Education Foundation
Godfrey University, Enugu
nekwuvero@yahoo.co
08173799344
And
Dr. (Mrs.) Hilda Agusiobo
Department of Education Foundations
Godfrey Okoye University, Enugu
Hildagusiobo@yahoo.com
08037028652

Abstract

The importance of civic education in the curriculum of secondary education cannot be over-emphasized. In particular, students at that level of formative development are equipped with critical skills and knowledge for effective social integration. This underscores the need for this study that investigated the effects of utilizing visual information aids in making the teaching of civic education effective in the school, Three research questions that were turned in the hypotheses guided the investigation. The experimental research design was adopted for the study that had all the senior secondary school students in Enugu Education zone as target population. All the l 10 SS2A and SS2B students in secondary schools in Enugu Education zone constituted the experimental and control samples respectively, The two groups were taught two (2) topics: "Citizenship" and "Social Responsibilities" with visual information aids (videos) for five(3) weeks after which their performance was evaluated with a 30-item objective test, The performance scores of the students in the two groups was analysed using the ANCOVA statistics. The result of analysis . showed that students taught with video (Visual Information Aid) performed significantly better than students taught without visual information aid. Based on the findings, it was recommended among others that civic education classes be taught with visual information aids.

Key Words: Civic Education, students, learning visual information aids.

Introduction/Theoretical Foundation

The world today could be rightly described as a global village. For this reason 'every country strives to develop the capacity of its citizenry to understand

the environment. It is obvious that Nigeria is in dire need of civic education teachers to help her move forward in the search for national and international integration. The approaches employed in achieving this development and diversification may vary from country to country. However, appropriate civic education stands out as an incontrovertible factor in this regard. Reports have shown that the performance of students at the high school level is depressingly poor. Students' difficulties in biology practical in Nigeria have been diagnosed to include identification and classification of specimen, inability to observe parts identified and inability to label parts observed from specimens, (Qgunsola-Bandele and Lawan 1997; Nworgu, 1999). The persistent problem which science educators are now faced with is to develop strategies that could contribute to the improvement of student's

performance in terms of achievement and attitude to science. 1

For many years. Civic education teachers and the concerned citizens of Nigeria have been grappling with this problem of finding solution to the perennial problem of poor performance, low achievement and poor students attitude towards education. The use of the resources as an important facility in the teaching of civic to improve student achievement and interest has been variously reported (Dechsri, Jones and Heikkinen, 1997: Tamir 1977). Several studies have emphasized other benefits of teaching-learning activities apart from giving students the opportunity to behave like patriots (Ango and Sila, 1985; Ehiemere, 1978; Tymir and Lunetta, 1981). Despite these research reports that emphasize the use and value of the pedagogy, the rates of failure and drop out from civic education classes in Nigeria still continue to be on the increase (Urevbu, 1997). A lot of effort has been made to find and identify the variables that will enhance and improve classroom Instruction and students achievement. Civic education educators have, therefore, directed their attention to the education policy handbooks or manuals in use in secondary schools.

The use of diagrams in teaching has been worked on extensively, Picture-word diagrams were found effective for low verbal learners (Holliday. 1976) while block-diagrams containing no pictorial materials were effective for high verbal learners (Winn. 1981). Knowlton (1996) in an earlier study showed that Pictorial adjuncts fulfill a variety of function in processing and storing verbal information, especially when the verbal learning task involves understanding of relationships. This is achieved through supplemental visual displays such as schematic diagrams in which all the relationships are structurally coordinated. Such visual displays help to overcome limitations in the capability of the learner to notice, encode, link and retain a sequence of ideas. Noh and Scharmann (1997) used pictures with relevance to the target concept and found that instruction became more effective in improving student conceptions of chemistry concepts. However, this depends on the efficiency of the treatment and the grade of introduction of the topic in question. The authors, therefore, suggested that teachers increase their use of the topic in question. The authors therefore, suggested that teachers increase their use of pictorial materials, especially when introducing new concept that prove difficult to understand. Other researchers also attest to the efficacy of pictures and diagrams in learning (Chandler and Sweller, 1992; Guri-Roseriblit, 1988; Reid and Miller. 1980).

The laboratory is also a factor in the teaching-learning environment that is intrinsic to the development of positive student attitude. In response to this

awareness of attitudinal implication of instruction, many models that describe the relationship between instruction, attitude and achievement have been put forward (Okebukola, 1986; Schibeci and Riley, 1986). These works are consistent in reporting that achievement in science does not influence attitude towards science but that the nature of science instruction (e.g. laboratory instruction) affects attitude toward science, which, in turn predict achievement, science learning and the amount of science, a student will choose to experience. Freedmim (1997) in an experimental study of the use of laboratory instruction as a means of improving students attitude towards learning and increasing students achievement level found that laboratory experiences have a positive influence on the student's attitude and their achievement in science knowledge.

From the discussion above it is evident that several of these studies on improving students'learning are done outside Nigeria. Little effort has focused on Nigeria. Taking into account Nigeria's need for national integration and cohesion with good orientation in teaching-learning aided activities, it becomes necessary to investigate any factor that will lead to the attainment of this goal. This study therefore, developed instruments which included a civic education manual with Visual Information Processing Aids (VIPA), assessment instruments for attitude achievement and investigated the effects of the laboratory manual on students attitude and learning in civic education. The .study is based on the theory and concept of information processing (Gagne, 1962) and schema theory of learning (Anderson, 1990).

Gagne suggested that mental processes go on in learning or in any type of memory task. Receptance is when sense organs receive stimuli from the environment and generate patterns of neutral impulses. Selective perception is when the neutral impulses are sent to a sensory register, a mechanism in the brain, which receives them and rejects those that are irrelevant. Short-term storage is when the selected impulses are sent to the short-term memory and kept temporarily. Semantic encoding is when the information is encoded for permanent storage and long-term storage is when the item is placed in the long-term memory. When the information is needed again, a retrieval process is initiated. Considering these processes, Gagne suggested certain instructional events and actions necessary for each process. For receptance of the stimuli, an instructional event that will help students gain attention is necessary. This is possible by the use of an abrupt stimulus. For selective perception also, a stimulus which can display content with

distinctive features is necessary. In a poor laboratory where equipment is not available in sufficient amounts and in situations where students had not had the opportunities to interact with science materials, one way of making students gain attention is by presenting the stimuli in the form of pictures or diagrams. Such pictures or diagrams of the apparatus or procedures will help display the content of the activities.

Anderson's schema theory of learning views organized knowledge as an elaborate network of abstract mental structures, which represents one's understanding of the world. Anderson (1990) noted that this process of visual information processing begins when light from the object (stimulus) enters the visual organs (eye). It is registered by the visual receptors, which can only store a small amount of the information for a short time before transferring or committing it to the memory storage organs. This stored information can then be recalled and matched with that from long-term memory to form the working memory. It follows, therefore, that where a student's mental capacity is found inadequate for processing, a large amount of information, presenting it in the form of pictures, diagrams, models and concrete objects might ease this task of conceptualization and remembering. Shavelson (1974) illustrated this human model of information processing diagrammatically as shown in figure 1
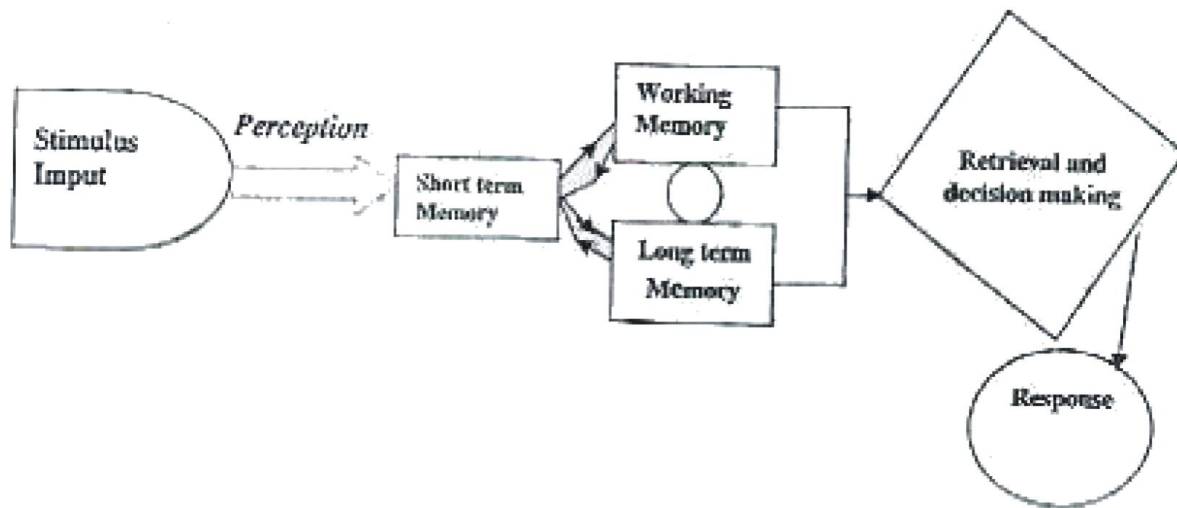

Fig. 1; Shavelson's (1974) Human Model of Information Processing

In any visual aided learning activity in which the student is unaware of the

relevant prior knowledge or background information subsumed in the memory or cognitive structures, he is likely to go through the exercise or activity without any substantial gain and without understanding the learning inherent in the laboratory activity. Any manual which could help the student process the new information by tapping from the stored knowledge, will make such laboratory activity more meaningful. This study therefore is an attempt to use this conception and theory to explore the visual aided learning activities and their possible effects on students' attitude.

Based on the problem of the study, the following hypotheses were formulated and tested:

1. There is no .significant difference in civic education achievement of students taught with VIPA and those taught without visual information aids.

2. Achievement scores of students who used the visual information aids are

   not significantly different from those who did not use based on sex.

3. Achievement scores of male and female students who used the VIPA manual are not significantly different from those who did not use the manual based on their attitude towards civic education.

Method of study

The study is a quasi-experimental design. Intact classes were used for the experimental and control groups. Senior secondary class II civic education students from St Patricks' secondary school Emene,Enugu, Nigeria, participated in the study. The school is boys school and located in an urban area. A total of 110 students (sixty-three in the experimental group and forty-seven in the control group) participated in the study. There were forty experimental males and twenty-eight control males. There were also twenty-three experimental females and nineteen control females. The mean age of the students is sixteen years with an age range of fourteen to nineteen. Three major instruments were used in this study:

1. **Laboratory manuals** - an experimental manual with diagrams and a conventional one that contained no diagrams. Both were similar in content. The conventional manual had a preliminary section showing clearly stated objectives, summary of the activities and the pattern of expected laboratory reports for three topics (test of mineral salts in the soil, effect of saliva on starch, and diffusion), selected for the study. The content of the manual is written in a simplified language to avoid contradictions and verbal complications. The manual is written in such a way as to direct students to practice necessary skills before they are used in the activities. Finally, the laboratory procedures are sequenced into steps. The experimental manual

shared similar characteristics as the conventional manual except for the inclusion of line diagrams. The diagrams introduced the new equipment, illustrated correct handling and also showed procedural sequence.

2. **An attitude scale** - This included a five point liker scale with responses ranging from strongly agree to strongly disagree, and was adapted from Hofsteine, Ben-Zvi and Samuel (1976) attitudinal scale pattern. The items were nineteen in all and were positively or negatively worded.

3. **The achievement test** - This consisted of fourteen multiple-choice Items and was developed from the three laboratory activities for the study.

The laboratory manuals were content validated while reliability of the attitudinal scale and the achievement tests were calculated. Using crombach alpha, the internal consistency of the attitudinal scale was found to be 0.86, while kuder-Richardson 21 reliability score for the achievement test was ().67.

Treatment lasted for a period of five weeks. The first week involved introduction and orientation, and a pre-test administration of the achievement test. Laboratory sessions and activities using the manuals were administered during the following weeks. Post-test and the attitudinal scale were administered during the last week.

Responses on the two assessment instruments were scored, For the achievement test a correct answer scored one point while a wrong answer scored no point. For the attitude scale, a positively worded item scored five points for strongly agreed and one point for strongly disagree; and vice versa for negatively worded items. Since there were 14 items on the achievement test, the Maximum score for a student was 14. The attitude scale had nineteen items and the maximum score was 95 while the minimum was 19. Significant differences were determined using analysis of covariance. All decisions to accept or reject a hypothesis were made at the 0.05 level of significance.

Results

The results on Table 1 are used to investigate the hypothesis on differences

in achievement between experimental and control groups.

TABLE 1: mean scores on Achievement pretest and posttest

	Experimental Group (n=63)		Control Group (n=47)	
	Mean	std. Deviation	Mean	std. Deviation
Achievement pretest	8.81	1.76	7.40	1.74
Achievement posttest	9.24	2.00	7.89	1.55

In general, there is a higher mean score on the posttest than the pre-test. On the significance of the differences, an Analysis of Covariance (ANCOVA) was carried out and the results are presented on Table 2

Table 2: test of Between-subjects Effect

Dependent variable: post-test scores

Source	Df	mean square	F	sig.	Noncent. parameter	------
Corrected model	156.427[b] 2	78.2213	33.458	.000	66.916	1.0000
Intercept	74.708 1	74.708	31.959	.000	31.959	1.0000
PRÊT	107.769 1	107.769	46.101	.000	46.101	1.0000
GROUP	6.830 1	6.830	2.922	.000	2.922	.395
ERROR	250.128 1	07 2.338				
TOTAL	8663.000 1	10				
----TOTAL	406.555 1	09				

COMPUTED USING ALPHA = .05
B- r SQUARE = .385 (Adjusted R square = .373)

Result reveal that in general the experimental group demonstrated significant higher achievement than the control group at an alpha level of 0.09 and not 0.05.

The extent to which the annual affected the performance of male and female in the experimental group as against the control group was also sort. The summary of the analysis is presented on Table 3 and 4.

Table 3: mean store Achievement of experimental and control males and females

Sex	Groups	mean	std Deviation	N
Male	Experimental Group	9.38	2.07	40
	Control Group	7.57	1.79	28
	Total	8.63	2.14	68
Female	Experimental group	9.00	1.88	23
	Control Group	8.37	.96	19
	Total Group	8.71	1.55	42

Result on table 3 indicate a higher mean achievement for both experimental males and females

than for the control group, an indication that students who used the visual information processing aid performed better than those who did not used the aid. The extent to which the differences are significant was tested using analysis of covariance and the result is presented in Table 4.

Table 4: Tests of Between-subjects Effects for Males and female

Sex	source	Typeiiisumofsquares	D	F	Mean square	F	S	I	g
Male	Corrected model	139.066[a]	2		69.533	26.784	. 0	0	0
	Intercept	23.828	1		23 .828	9.179	. 0	0	4
	Prêt	85.8288	1		.85.828	32.930	. 0	0	0
	Group	.955	1		.955	.368	. 5	4	6
	Error	168.743	6	5	2.596				
	Total	5375.000	6	8					
	Corrected Total	307.809	6	7					
Female	Corrected model	124.828	1		12.171	6.394	. 0	0	4
	Intercept	48.817	1		48.171	6.398	. 0	0	0
	Prêt	20.1911	1		20.191	10.608	. 0	0	2
	Group	2.9351	3	9	1.903				
	Error	74.230	3	2					
	Corrected Toal	98.5714	1						

[a]R Squared = 452 (Adjusted R Square =.435)
[b]R Squared =.247 (Adjusted R Square =.208)

Although there are differences in the mean posttest achievement scores for male and females in the two groups, the differences were not statistically significant as shown on Table 4.

Attempt was also made to find out the effect of VIPA on male and Female students with different attitudes to civic education. Students attitude were categorized as positive for at least agreeing with the items or negative for not at least agreeing. Results of students' achievements are presented on Table 5 and 6

Table 5: mean score of Experimental and control Students with Different Attitudes

Sex	Attitude Category	G R O U P S						MEAN	std Deviation	N	
	Male positive	Experimental group						9.42	2.11	3	8
		Control group						7.83	1.74	2	4
		Total						18.81	2.11	6	2
	negative	Experimental group						8.50	.71	2	
		Control group						6.00	1.41	4	
		Total						6.83	1.72	6	
	Female positive	Experimental group						9.14	1.85	2	1
		Control group						8.24	.90	1	7
		Total						8.74	1.55	3	8
	Negative	Experimental group						7.50	2.12	2	
		Control group						9.50	.71	2	
		Total						18.50	1.3	4	

Result on Table 5 are indication of higher posttest mean achievement of experimental positive males and female over the control group. However, a striking difference is observed for negative female students, where the control group female with negative attitude scored higher

in the posttest. The significance of the differences was also carried out using analysis of covariance as shown on Table 6.

Table 6. Analysis of Covariance for Experimental males and female with Different Attitudes.

Dependent variable: post-test scores

Sex	source		d f	mean square	F	sig
Male positive	corrected model	126.726	2	63.363	25.791	.000
	Intercept	20.068		1 20.068	8.168	.006
	PRET	89.645	1	89.645	36.489	.000
	GROUP	67.095E-02	1	7.095E-02	0.29	.866
	ERROR	144.951	5 9	2.457		
	TOTAL	5080.000	6			
	Corrected Total	271.677	6			.
Negative	corrected Model	9195 [b]	2	4.5982	2.446	.234
	Intercept	11.361	1	1.361 6.	045	.091
	PRET	.862	1	.862	.4 5 9.04 9	.547
	GROUP	295.000	1	5.940	3161	.173
	Total	295.000	6			
	Corrected Total	29.368	5			
Female positive	corrected model	35.115 [c]	2	17.557	11.327	.000
	Intercept	33.032	1	33.0321	. 310	.000
	GROUP	7.396	1	7.398	4.772	.036
	PRET	27.377	1	27.032	17.661	.000
	Error	54.253	3 5	1.550		
	Total	29990.000	3 8			
	Corrected Total	89.368	3 7			
Negative	corrected model	8.000 [d]	2	4.000	4.000	.333
	Intercept	9.774	1	9.774	9.744	.197
	PRET	4.000	1	4.000	4.000	.295
	GROUP	.800	1	.4000	4.000	.295
	Error	1.000	1	.8000	.800	.5 3
	Total	298.000	4	1.000		
	Corrected Total	9.000	3			

[a] R Square = 466 (Adjusted R Square=.448
[b] R Square = 620(Adjusted R Square = .367)
[c] R Square = 393 (Adjusted R Square = .358)
[d] R Square .889 (Adjusted R Square = .667)

In all cases, there were also no significant difference in achievement except for the female students with positive attitude. Consequently, it may be stated that female students with positive attitude who used VIPA performed better than female with positive attitude who did not use the VIPA.

Discussion

The result of this study is similar to that of Thomas (1978) which did not find any evidence to support that pictures influence comprehension of concepts. He however did not report any adverse effect of such pictures and illustrations. These results may be justified by the fact that cognition involves concepts, understanding and intellectual reproduction of facts, as well as their utility in problem situations. The subjects may not have effectively utilized the presence of aids in the teaching-learning environment. This may probably be due to lack of necessary background knowledge on the concepts. Noli and Scharmann (1997) had reported that such aids would only directly influence achievement if they were with relevance to targeted concepts. Since the use of visual aids aimed only at the introduction of apparatus and sequencing of steps, a difficult task of abstracting meanings cognitively from the teaching-learning sessions might have arisen. This may be overcome overtime with a more frequent application and concept teaching prior to treatment. Higher mean post scores of the experimental groups and a significant difference between experimental females with positive attitude is worth noting. Schihcci and Riley (1986), Hagarty - Hazel (1990) and Simpson and Oliver (1990) have unanimously reported the influence of attitude towards science on achievement. They explained that attitude towards science predict achievement. It means therefore that with a continuous use of visual information processing, aids (VIPA) learners attitude to science is likely to increase positively and in turn induce higher achievement.

Conclusion and Recommendations

The results of this study led to the conclusion that a Teaching-learning session with visual information processing aid may help students perform better in cognitive and affective domain. It is evident that aids manual had effect on achievement (although not quite significant) as well as increased attitude to civic education of females. Therefore, the need to incorporate such aids into the curriculum reforms is necessary. Using such visual aids, students will be able to process information, develop their intellectual abilities, as well as become patriotic and responsible. Nigerian researchers and educators should see it as of great importance to develop such visual aids by participating in textbook writing and analyses.

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