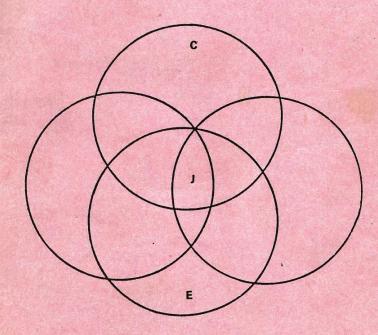T. N. EKPO

Gender-Anxiety Interaction on Testing and the case of Instructional Design and Implementation

by

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Abstract

Independent t-test results used to compare the mean difference between the sexes, test duration and level of anxiety indicated a significant mean difference in scores between the high and low anxiety groups and no significant difference betwen the sexes (t-cal = 0.25, 1.688 and 7.07). The result of 2-way ANOVA for the experimental and control groups indicated significant interaction (F=.432,3.141) effect of anxiety and gender and very low effect of both gender and anxiety on their own. It is therefore concluded that gender and anxiety are on their own innocuous. Their effects manifest when they interact. Relevant recommendations based on instructional design and implementation are suggested.

The Study Context

As the society becomes more complex and technologically oriented there is even greater knowledge explosion. The Educational psychologists and researchers have greater roles to play. They become more and more challenged by the complexity of human learning and behaviours capable of being exhibited as a result of learning experiences. Consequently, they become more concerned about the design, implementation and evaluation of learning experiences to reflect the learner complex characteristics as well as the wide variety of the complex interacting variables surrounding the learner. Sharper and more objective instruments to test learning experiences are consequently developed.

The curriculum developers, for example also become continually challenged to redefine the curriculum process in such a way that both the hidden and the overt curriculum variables are accounted for by school learning, at all levels of education.

The Educational Technologists become more concerned with the learner variables that interact with various instructional materials attributes to facilitate achievement given appropriate settings, processes and products of modern technologies. As instructional systems analysts they become more involved with interacting effects of all imput components on the expected output based on their heuristic field concepts.

Such concern keep mounting particularly for the educational psychologists, who in recognition of the interaction effects of individual personality with other instructional variables are persistently expanding their areas of concern beyond the learner immediate behaviour, experiences and ecological surroundings to embody interaction effects of these variables. All these call for better knowledge of how the learning, testing, personlity and environmental factors interact to determine the level of performance of the learners.

The craze for certification rather than competence has assumed a parallel with success in life. Consequently, students, parents, and even teachers become poised to achieve that success at all cost. Consequently the ever-increasing educational demands have risen pressure on students who are held accountable for their performance at school. The so-called objective effort lacks in effectiveness and takes pre-eminence over the more enduring and better demanded affectivity. All these result in mounting presure and anxiety among the students. The incidence of continuous assessment does not solve the problem because each time test comes up students still fell the pangs of test enxiety.

The Problem

The degree of anxiety associated with test may vary, among other things with gender, type and duration of test, perception of the importance of the test and even timing of the test. Yet the interaction effects of learner attributes and treatment variables have not received adequate attention (Borg and Gall: 1979; Kerlinger: 1973; Mouly: 1978) despite their importance to the educational psychologist. This paper is therefore designed to emphasize the importance of attribute interaction. Specifically it is designed to answer the question:

What is the relative effect of anxiety on test performance given gender as a moderator variable?

The Hypotheses

Based on the problems and the context specified above, the following hypotheses are proposed:

(a) *Male and Female Students are not significantly different in their English Language test performance if exposed to identical testing situation*

(b) *Performance of students exposed to longer test duration does not significantly differ ffom that of student's exposed to shorter testing time*

(c) *Test performance does not very with interaction effect of test anxiety on gender characteristics*

The 300 participants (150 for either sex) in the study were randomly sampled from Senior Secondary Class Three (SSIII) of the three schools (one mixed, one girls and one boys) in Calabar Municipality using the cluster sampling technique. The Senior Class 111 was selected because their twelve years of schooling was accepted to have provided adequate commulative experience in test-taking which should therefore dull the effect of test anxiety and provide a common footing for them. They were aged between 17 and 19 years. The few students who showed visible signs or symptoms of illness were replaced before the administration of the instrument. It was accepted that all the sample exposed to the treatment variables were physically fit considering that they were ready for the normal school activities.

The Instrument

A 40-item teacher-made test and five wrist watches as aids for taking pulse rate were the major instruments used for data collection.

The 40-item teacher-made test was based on senior secondary two English language prescribed textbook and syllabus to ensure content validity. It also covered the four basic sections of English language teaching: reading and comprehension (9 items) structure (13 itmes), vocabulary (10 items) and idiomatic expression (8 items). An analysis of the test items based on Bloom's taxonomic levels of the cognitive domain showed 6, 5, 9, 7, 5, 5 as to the item per memory, comprehension, application, analysis, synthesis and evaluation levels respectively. The multiple-choice, true-false, matching and completion items were represented in the ratio of 4:2:1:1 respectively. Normally the test was designed to last for 45 minutes. The Spearman-Brown Prophecy Formula on the split-halves showed a very high reliability value (r= 0.92) using forty students (20 boys and 20 girls) from a non-participating school. The five wrist watches owned by five nurses-in-training were used for observing the pulse rate of the subjects before and during the test. Care was taken to ensure the gadgets were in good working condition.

Procedure

The teacher-made test was administered by the class teacher and supervised by a research assistant. This ensured that the instrument administration was done according to specifications agreed upon. In each school two groups of fifty students were exposed to the treament variable

They were assembled in the normal classroom situation and briefed on the need to check up their pressure rate from time to time. Each nurse then took the initial (control) pulse rate of ten students at an average of fifteen seconds per student, multiplied this by four to get the normal pulse rate per minute. The same procedure was followed in both groups in all three schools selected for the exercise.

After the initial (control) pulse rate exercise the teacher-made test was administered under normal classroom testing conditions. To the control group a longer test duration (forty-five minutes) was allowed. They were not told anything about the importance of the test except to follow the instruction and keep to their work. This was deliberately done to make for a more relaxed testing atmosphere. But to the experimental group the test lasted for thirty minutes. The importance of the test in relation to their continuous assessment was emphasized. Students were also told to speed up to ensure completion of the test. This was also a deliberate manipulation of the test anxiety level of the experimental sample.

At half time the experimental (second) pulse rate was taken following the same order and procedure as for the control pulse rate earlier taken. At full time both the answer script and the question papers were collected back for scoring. The independent t-test and the 2-way ANOVA were used for computing the resulting data for testing the hypotheses.

Data Analysis and Discussion of Results

Each stated hypothesis was tested accordingly and the results are briefly discussed below.

Hypothesis I

Male and female students are not significantly different in their English Language test performance if exposed to identical testing situation.

Each of the two groups of students was treated separately with the independent t-test which results are as presented on table 1(A).

Table 1(A)

Independent t-test of Students scores when exposed to 45 minutes (longer) test duration.

Group	N	$\overline{X}$	SD	t-cal	df	t-crit
Male	75	24.62	6.77			
				0.25*	148	1.96
Female	75	24.92	7.44			

*p>.05

An insignificant observation was made in relation to the performance of the students exposed to the longer test anxiety generating testing situation. This finding contradicts the works of Milton (1957) who postulated the supremacy of females over males in verbal ability. The study confirms Onyehala (1986) who observed no significant difference among students gender.

In order to confirm this observation, data for the students exposed to shorter test time were also computed as shown on table 1 (B).

TABLE 1 (B)
Independent t-test scores of students exposed to 30 minutes (shorter) test duration.

Group	N	$\overline{X}$	SD	t-cal	df	t-crit
Male	75	18.97	6.367			
				1.688*	148	1.96
Female	75	20.678	6.02			

*p>.05

Available data show that whether exposed to long or short testing time both male and female students perform essentially the same. The implication of these is that sex is not a major determinant of perfomance in English Language test, and by extension any other subject area. Societal expectation and sex stereotyping could account for some of such conclusions (Onyejiaku: 1980, 1982; Hurlock: 1974; Wiggins, Renner, Clore, Rose: 1976)

Hypothesis 2

Performance of students exposed to longer test duration does not significantly differ from that of students exposed to shorter testing time.

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To test for effect of test duration and anxiety it was necessary to compare the two groups of students using the independent t-test. The results are as shown on table 2.

Table 2
Independent t-test of the High and Low Anxiety groups in English Language test.

Group	N	$\overline{Y}$	SD	t-cal	df	t-crit
Low Anxiety	150	24.77	6.1			
				7.07*	298	1.96
High Anxiety	150	13.S24	6.194			

*p.<0.05 significant

Available data based on independent t-test support the view that high anxiety impedes performance (Eysenck: 1972, Johnson and Medinus: 1974) while moderate anxiety (Lynn: 1969) can be energizing.

The implication of this finding to curriculum design is underlined by the importance of evaluation. Less anxious moments could be in-built in schooling if less certificate worship could be emphasized. The curriculum should be designed so that more emphasis is given to job skills, competence, good work habit, effective interpersonal relationship among other affective competencies.

Hypothesis 3

Test performance does not significantly vary with interaction effect of test anxiety on gender characteristics.

From the data based on 2-way ANOVA (factorial design) as shown on table 3, it is evident that neither anxiety nor gender are important on and by themselves in their effect on performance.

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They are effective when they interact with other variables within the instructional situation.

TABLE 3

Two-way ANOVA of Anxiety - Gender Interaction Effect on Performance in English Language Among Control and Experimental Groups.

Group	Source	SS	df	MS	F-cal
Exp.	Anxiety (1)	176.997	2	88.499	1.823*
	Gender (2)	29.927	1	29.927	0.877*
	1 x 2	418.378	2	200.689	4.323**
	Error	6989.638	144	48.539	
Control	Anxiety (1)	140.64	2	70.32	1.761*
	Gender (2)	18.32	1	18.32	0.23*
	1 x 2	125.13	2	62.57	3.141**
	Error	5736.76	144	39.839	

F-crit 0.05 = 3.06

**$p < 0.05$

*$p > 0.05$

It is therefore obvious that neither anxiety nor gender is a significant factor affecting performance. Their effects can only be observed as a result of interaction with other personal, ecological, situational and other variables (Romiszwoski: 1988; Abraham, Lacey and Williams: 1990). This finding expands other available research findings that tend to attribute performance to single factors such as gender, anxiety or teacher effectiveness. Systems approach should be encouraged (Gagne and Briggs, 1979).

Summary and Conclusion

Related to instructional design therefore the obvious implication is that more emphasis should be given to systems design of instruction to take care of both the major and minor variables that can influence learning. Test results should no longer be seen only in the light of the student capability but more so as such score is affected by both the constraints around and within the learner. Obviously Educational psychologists have the great responsibility of finding out more of the interreaction effects of complex variables on the learner performance both at the curriculum implementation and testing levels.

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