

PREFERENCES FOR TEST TYPE BY TEACHERS OF CHEMISTRY IN ILORIN, NIGERIA.

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Abstract

Gradual decline in performance of senior secondary school students in chemistry over the years could be attributed to the kind of test they are been exposed to. Therefore, the study investigated preferences for test type by teachers of chemistry in Ilorin, Nigeria.

This study was a descriptive research of the survey type. A total of 18 male and female teachers of chemistry drawn from both public and private schools participated in this study. Three (3) research questions were raised and answered using the mean while two (2) research hypotheses were formulated and tested at 0.05 level of significance using chi-square statistics. The research instrument used in this study was researcher-designed questionnaire based on the three test types considered which were essay extended, essay restricted and multiple choice test types tagged as Test Type Preference Teachers' Questionnaire (TTPTQ).

Findings of this study revealed that the difference that existed in the chemistry teachers' preferences for test type only occurred in the essay restricted and multiple choice test types. In the case of the essay extended, the two set of chemistry teachers did not differ in their preferences. This means male and female chemistry teachers liked essay extended, male teachers like multiple choice next to essay extended and essay restricted last. But the female teachers preferred essay restricted and multiple choice almost, equally and the difference was not significant at ($\chi = 2.626$, sig. $0.377 > 0.05$). α level 0.05, there were also differences in the preferences of chemistry teachers for test type based on school type. Teachers from both public and private schools preferred essay extended first. Teachers from public schools liked essay restricted a head of multiple choice test type, while teachers from private schools showed preference for multiple choice than essay restricted. The difference was not significant at ($\chi = 1.772$, sig. $0.708 > 0.05$). α level 0.05.

Keywords: Preferences, Test Type, Teachers of Chemistry

Introduction

Science can be defined as a body of knowledge, a way of criticizing and classifying for better understanding of the physical universe. This is supported by Abimbola (2013) who expressed science as a body of knowledge, a way or method of investigating and a way

of thinking in the pursuit of an understanding of the nature. Olorundare (2014) also defined science as a discipline which is self-criticizing and correcting of which its improving activities rest on the facts gotten from the activities of natural phenomenon of the universe.

Science has two main branches which are pure and applied sciences. The pure aspect of science deals with what science is and how scientist works, while the applied science is about the application of scientific knowledge to improve all facets of human endeavour (Abdulrasaq, 2011). The pure aspect of science has three main branches of which chemistry is one and the remaining two are biology and physics.

Ababio (2013) perceived chemistry to deal with compositions, properties and uses of matter, it examines the principles governing the changes that matter undergoes. Chemistry occupies a central position among secondary school science subjects since it serves as a link between biology and physics by having its in both biology and physics.

Chemistry is also viewed by Ababio (2013) as a subject that teaches nature, structure, properties, composition and uses of matter. Since there is no scientific transformation and technological advancement without the use of what chemists refer to as matter, the nucleus position of chemistry in the development of all facets of human endeavour cannot be over emphasized.

In the same vein, as the acquisition of chemistry knowledge is crucial, it is paramount to also determine the level of chemistry knowledge acquired by students. In determining the level of acquired chemistry knowledge in schools, the use of test and its kinds are of great importance.

Teachers use test to determine the extent at which someone's knowledge or proficiency in a subject or skill is. It is a set of written or oral questions designed to reveal person's knowledge (Saone & Steven, 2003). Test is mostly used and designed by teacher in every formal school setting to determine the level of teaching-learning that has taken place. A test if properly conducted reveals the extent to which factual knowledge is attained by students, predicts future educational achievement and provide a means of selecting qualified candidates for certain educational or occupational courses (Adegoke, 2010). Test is a feedback tool adopted by teachers since one of its principal aims is the assessment of how much learning has taken place and the extent at which educational objective is achieved (Adegoke, 2010).

In every formal school setting, teachers used different types of test (e.g extended essay, restricted essay, multiple choice etc.) to obtain information about what students learn as a result of their experience in school. (Alice, Iroha, Usang & Peter, 2005). The importance of test can never be over emphasized. This is because test serves as one of the ways by which knowledge attainment is empirically determined (Alonge, 2003).

At the secondary school level, teachers use test procedure termly and yearly not only to determine their students' level of knowledge but to also prepare them for external examinations like Senior Secondary Certificate Examination (SSCE), Unified Tertiary Matriculation Examination (UTME) and to face challenges in the higher institutions of learning, just to mention a few. This is in line with the Alice et al (2005) proclaimed that scores from students' test remain vital to the issue of appropriateness in the educational enterprise; its crucial nature necessitates the application of all seriousness in the

development of its instruments, administration procedures, scoring and interpretation of the scores from a variety of tests and other measuring instruments.

According to Jamal and Christian (2005) assessments play an integral role in instruction, placement, promotion and efforts to ensure that students and teachers receive the support required for success.

The decline in the percentage pass of students in May/June chemistry examinations as contained in the Chief Examiners' Reports of the West African Examinations Council (WAEC) for 2006 to 2016 and the submissions of Abimbola (2013) and Olorundare (2014) as depicted in table 1 necessitates the research of this kind.

It can be observed from the table 1 that the percentage pass for the years is not up to 70% except for the year 2013 which is 72.34%.

Table 1. Students' performances in May/June Senior School Certificate Examination in Chemistry

Year	Number of Candidate	Credit Pass	Percentage Pass (%)
2006	308,104	170,506	55.34
2007	424,747	196,063	46.16
2008	456,980	202,762	44.37
2009	422,091	194,035	45.97
2010	465,643	236,059	50.7
2011	565,692	280,250	49.54
2012	627,301	270,570	43.13
2013	639,296	462,517	72.34
2014	636,268	397,649	62.49
2015	680,357	412,323	60.6
2016	706,873	408,122	57.74

Source: WAEC (2016) and inaugural lecture series of the University of Ilorin, Nigeria by Abimbola (2013) and Olorundare (2014).

Research of this nature is necessary to determine teachers' preferences for test type and it is hopes that it will help improve students' performances in their examinations.

Statement of the Problem

The West African Examinations Council's Chief Examiners' Reports for the 2006 to 2016 May/June Senior School Certificate Examination (SSCE) revealed that students' performances in Chemistry were discouraging.

The students' poor performances may be inferred from the effect of teachers' test type preferences. To assist students improve their academic performance, this study investigated the chemistry teachers' test type preferences so that its outcome can be used as guide for proper teacher-student interaction which in turn could improve the performance of students in chemistry.

Although, researchers have worked on preferences of students on test type, it was observed that preferences of teachers on test type has not been investigated by the previous researchers. For instance, In a study as revealed by article of instructional science (1997) that determined the Types of Preferred Examination Among Secondary School Students in Science Disciplines according to school type affiliate and gender, it was discovered that students preferred essay extended test when open book examination was given to them. In the same vein, Urizoller and David (1989) concluded that students preferences for essay extended test was higher when they were given open-book and unlimited time examination.

Watering, Gibel and Dochy (2008) claimed that students preferred essay restricted test type when they were in new learning environment. Therefore, this study shed more light on the preferences for test type by teachers of chemistry. The main purpose of this study was to determine the preferences of secondary school chemistry teachers for test type.

Research Questions

The following questions were raised as guide in this study

1. What are the preferences of Secondary School chemistry teachers for test type?
2. Are there differences in the preferences of male and female Secondary School chemistry teachers for test type?
3. Are there differences in the preferences of secondary school chemistry teachers for test type in both public and private schools?

Research Hypotheses

The following null hypotheses were tested in this study

H01: There is no significant difference in the preferences of male and female secondary school chemistry teachers for test type.

H02: There is no significant difference in the preferences of secondary school chemistry teachers for test type in both public and private schools.

Methodology

This study employed a descriptive method of the survey type. The population for this study was the senior secondary school chemistry teachers in Ilorin metropolis of Kwara state while the target population was SSII chemistry teachers in Ilorin. The choice of SSII teachers was on the assumption that, the teachers are in the class that bridged the gap

between the newly admitted students to SS I and SS III students that are preparing for external examination.

The sample for this study was 18 chemistry teachers drawn from 18 secondary (coeducational) schools in Ilorin metropolis. Simple random sampling was used to select the participating schools. The instrument used in this study was researcher-designed questionnaire and tagged Test Type Preference Teachers' Questionnaire (TTPTQ). The instrument was adequately validated by experts and its reliability test yielded 0.84.

Data Analysis Techniques

The data collected for this study was analyzed using mean score and chi square statistics using Statistical Package for Social Science (SPSS) version 21.0. This implies that mean score was used to answer all the research questions while the chi square statistics was used to test all the research hypotheses at 0.05 level of significant.

Research Questions 1 and 2

What are the preferences of secondary school chemistry teachers for test type?

Are there differences in the preferences of male and female secondary school chemistry teachers for test type?

Table 2 revealed the preferences of secondary school chemistry teachers for test type and the differences that exist in the chemistry teachers' preferences for test type. The table shows that the only difference in the chemistry teachers' preference for test type occur in the essay restricted and multiple choice test types. While in the case of the essay extended, the two set of chemistry teachers do not differ in their preferences. That is male and female chemistry teachers liked essay extended first, male teachers like multiple choice next to essay extended and essay restricted last. But the female teachers preferred essay restricted and multiple choice almost equally.

Table 2. Mean Score Analysis of Chemistry Teachers' Preferences for Test Type Based on Gender.

	Essay extended		Essay restricted		Multiple Choice	
Gender	Mean	S.D	Mean	S.D	Mean	S.D
Male	26.82	3.093	23.27		4.452	25.09 4.230
Female	29.29	2.215	24.43		2.936	24.43 4.577

Hypothesis 1 was tested using the data presented in Table 3.

H01: There is no significant difference in the preferences of male and female secondary school chemistry teachers for test type.

Table 3 revealed that there is no significant difference in the preferences of male and female secondary school chemistry teachers for test type. Therefore, the null hypothesis stated is not rejected. This is because the significant value is greater than the 0.05 level of significant.

Table 3. Chi-Square Analysis of Chemistry Teachers' Preferences for Test Type Based on Gender.

	Essay extended	Essay restricted	Multiple Choice						
Gender	Observed (Expected)	No of	Students	Total	X^2	Df	Sig. value	Remark	
Male	8(7.9)	6(6.2)	4(3.9)	18	2.626	3	0.377	NS	
Female	6(6.1)	7(7.3)	5(4.6)						

Research question 3 was answered using the data presented in Table 4.

Research Question 3. Are there differences in the preferences of secondary school chemistry teachers for test type in both public and private schools?

Table 4 showed that there are differences in the preferences of chemistry teachers. Although, teachers from both public and private schools preferred essay extended first. Teachers from public schools liked essay restricted a head of multiple-choice test type, while teachers from private schools showed preference for multiple choice than essay restricted.

Table 4

Mean Score Analysis of Chemistry Teachers' Preferences for Test Type Based on School Type.

	Essay extended	Essay restricted	Multiple Choice			
School type	Mean	S.D	Mean	S.D	Mean	S.D
Public	26.50	2.665	24.83	3.601	24.67	4.633
Private	28.42	3.029	23.17	4.041	24.92	4.252

Hypothesis 2 was tested using the data presented in table 5.

H0₂: *There is no significant difference in the preferences of secondary school chemistry teachers for test type in both public and private schools.*

Table 5 revealed that there is no significant difference in the preferences of male and female secondary school chemistry students for test type. Therefore, the null hypothesis stated is not rejected. This is because the significant value is greater than the 0.05 level of significant.

Table 5. Chi-Square Analysis of Chemistry Teachers' Preferences for Test Type Based on School Type.

	Essay extended	Essay restricted	Multiple Choice					
School Type	Observed No of Students (Expected)			Total	X ²	Df	Sig. value	Remark
Public	9(7.2)	5(6.5)	4(4.3)	18	1.772	3	0.708	NS
Private	7(6.7)	7(6.8)	4(4.5)					

Discussion

The study showed teachers' (male and female) preferences for essay extended test type first, male teachers liked multiple choice test type next to essay extended and essay restricted was liked least. While female teachers preferred essay restricted and multiple choice test types equally next to essay extended.

Teachers from public and private schools showed preference for essay extended test type ahead of other test types considered, essay restricted test type was preferred ahead of the multiple choice by public schools teachers, while private school teachers preferred multiple choice ahead of the essay restricted test type.

Conclusion

Based on the discussion of the findings of this study, the following conclusions were made:

Chemistry teachers (male and female in both public and private schools) showed topmost preference for essay extended, public school teachers preferred essay restricted than multiple choice after the most preferred which essay was extended, while private school teachers showed their next preference for multiple choice ahead of essay restricted. Also, male teachers liked multiple choice ahead of essay restricted after their first preference (i.e essay extended). While female teachers preferred both essay restricted and multiple choice equally after their first preference (i.e essay extended).

Recommendations

Based on the major findings of this study, the following recommendations were made:

1. Chemistry teachers should endeavour as much as they could to avert their test type preferences negatively affecting their teaching or learning interactions with their students.
2. Irrespective of the teachers preferences for test type, the standard way of examining students should be up held to the highest by the personnel involved so that the quality aiming at in educational sector can be achieved.
3. Examination bodies should not limit their contributions to the success of education to only when the students are to write their assessment but to also assist in checking how the various schools terminal examination's questions are being constructed to ascertain standard.

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