DEVELOPMENT AND VALIDATION OF COMPETENCY BASED RATING INSTRUMENT FOR RE-ENGINEERING HEALTH EDUCATION TEACHERS FOR EFFECTIVE TEACHING IN SECONDARY SCHOOLS

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Abstract

The purpose of the study was to develop and validate, Competency-Based rating Instrument (CBRI) for re-engineering health education teachers for effective classroom performance. Four research questions guided the study. Relevant literature were reviewed to identify the task performance expected of health education teachers. Instrumentation design was employed in carrying out the study. A total of 287 health education teachers were used for the study. Based on the task analysis, 80 items were generated. 44 items were used for the final testing with an item total correlation of 0.20 to 0.53. The reliability coefficient of the instrument was .84 using Cronbach Alpha. The rater – reliability coefficient indicated a high rater agreement. Based on the findings it was recommended that CBRI be used in place of the existing proforma for evaluating health education teachers by inspectors and supervisors of health education, that the CBRI be used in evaluating health education student teachers.

Introduction

The quality of any health teaching and learning process according to the National Policy on Education (2001:10) takes into recognizance the need for teaching good habits, especially good health habits. This then calls for the health teachers' possession of a repertoire of relevant health skills and competencies on the subject matter which should include necessary skills for carrying out effective classroom health education instructions. However, insufficient facilities to ensure this and moreover, inappropriate assessment techniques in use in the school system may not be sensitive and valid enough to yield dependable measures of teachers level of mastery of all the competencies (Nwagu, 1992). This lack of facilities ad insensitivity of assessment techniques in the school system are capable of creating situations that would induce health teachers to loose sight of the basic competencies required for effective teaching of health education. The retention and sustenance of competencies by teachers of health education therefore, depend largely on the frequency of practice and motivation. This implies that the competencies acquired by health education teachers when in training would continue to depreciate if not used frequently in the classroom. This situation calls for constant monitoring and evaluation. It is in the light of monitoring and evaluating the health education teachers to ensure that they retain and use all the competencies acquired for effective teaching that Competency-Based Rating Instrument (CBRI) for re-engineering health education teachers is being developed.

The Competency-Based Rating Instrument (CBRI) takes into consideration the need for regular monitoring and evaluation of teaching performance of health education teachers to pinpoint achievements strengths and weakness of the teacher. The existing evaluation tool for teachers, which should be used for assessing every teachers no matter the subject area is lacking in competency coverage for health education teachers.

Instrument development is a skill that should be learned like any other skill. Good evaluation instrument do not just happen, it takes proper planning and careful considerations (Nworgu, 2003:61). When the need for evaluation has been established, the decision to take is the type of instrument to use for the evaluation. According to Okezie (1997) results form such instruments are used for making decision which have for reaching implications for the learners and teachers. If the component of test instrument inter-correlates highly Guilford (1954) stated that the test will have a high consistency estimate of 0.20 and above. This indicates a positive correlation between the test items. This indicates internal consistency among the test competent.

The Oxford Advanced Dictionary (2000) gave the meaning of competency as having necessary ability, authority, skill, knowledge, etc to do something while effective is having the desired effect or producing the intended result. Therefore effectiveness relates to the extent to which an individual teacher attain his/her set objectives.

Cornacchia and Station (1974) outlined the following competencies expected of a health education teacher to include; competency on health related issues, competency on health education instruction, competency on healthful school environment, competency on co-ordination of the school, the home and the community on health related issues, competency on school health services, competency on the administration of health education programme. The question now is: would the Competency-Based Rating Instrument likely to assess and enhance the teaching effectiveness of health education teachers, if used for re-engineering their teaching effectiveness.

Purpose of The Study

The main purpose of this study was to develop and validate the CBRI for re-engineering of teaching effectiveness of health education teachers.

Specifically the study was aimed to:

1. Find out the item-total correlation of the items in the CBRI
2. Determine the reliability coefficient of the CBRI and its subscales.
3. Establish the magnitude and direction of the inter-correlation of the instrument and its subscale.
4. Determine the rater-reliability coefficient of the four raters together using CBRI

Research Question

The study was guided by the following four research questions.

1. What id the item-total correlation of the CBRI?

2. What is the reliability coefficient of the CBRI and its subscales?
3. What is the magnitude and direction of the inter-correlation of the instrument and among the subscales in the CBRI?
4. What is the Rater-reliability coefficient of the four raters taken together using the CGRI?

Method

This is an instrumentation research as new instrument was developed in educational practice. The study was based in Enugu State. The population for the study comprised all the health education teachers teaching in Enugu State Secondary Schools. All the 287 health education teachers were used for the study. (Statistics Division Post Primary School, 2009). The instrument for data collection was the rating instrument for re-engineering health education teachers developed by the researcher hereafter referred to as competency-Based Rating Instrument (CBRI). The rating instrument consisted of two sections A and B. Section A dealt with the personal data of the teacher while section B sought information on the six clusters of teaching competencies outlined by Cornacchia and Station (1974). Each cluster has the following number of items: cluster A – 7 items, B – 28, C- 10, D – 17, E – 10 and F – 12 items respectively. Each rating item has a 5 point scale of very High competency – 5 points, High competency – 4 points, Average competency – 3 points; low competency – 2 points, very low competency – 1 point. This provided a rating schedule for the evaluation of health teachers.

CBRI items were subjected to 4 experts for face valuation. The experts were two (2) health education lecturers, one measurement and evaluation lecturer all from Enugu State University of Science and Technology and one supervisor form the Ministry of Education specialized in Health Education. Based on the opinions of the experts, necessary modifications were made and the second draft of the CBRI after validation contained 45 items. The reliability of the CBRI was confirmed from the result of the trial testing of the instrument on 20 health education teachers in Ebonyi State Secondary Schools. The result of the trial testing indicated that the reliability coefficient of CBRI yielded .79 indicating a high reliability coefficient using Cronbach Alpha co-efficient of Reliability.

The item-total correlation of the 45 items was obtained using the Special Package for Social Sciences (SPSS) to find out how positively or negatively associated were the CBRI items. An item that is positive and has an item-total correlation of 0.20 and above was included in the CBRI. A negative item-total correlation below 0.1 was not included in the CBRI. Cronbach coefficient alpha was used to determine the internal consistencies of the CBRI and its subscales. Correlation matrix table was used to show the correlation between each test item and all other items in the instrument. To determine the reliability of the four raters, Kendall's coefficient of concordance "W" was used to determine the scorers rating relationship for the instrument using the formula.

$$W = \frac{12(\sum T^2)}{M^2(N(N^2 - 1)} - \frac{(N + 2)}{N - 1}$$

Where T^2 is the square of sum of ranks

M is the number of raters

N is the number of teachers

Four rates were used to observe the health teachers simultaneously for the lesson of 45 minutes and also obtain their records at the end of the classroom observation. The score for each teacher was obtained by summing the scale value earned for each item and averaging the total score from the four raters. The researcher personally delivered the CBRI packets to the raters and collected the packets after each observation for analysis.

Result

Table 1: Item-total Correlation for CBRI

A	**General skill – competency on Health related Issues: Ability of the Teacher to Understand and Appreciate.**	**Suitability, Item-Total Correlation Coefficient**	**Decision**
1	The significance of children and youths health problems in learning.	0.20	S
2	The importance and the need for the school health programme in today's society.	0.25	S
3	The role of the teacher in each of the school health education programme components – service, environment, instruction and schools, home and community relationship	0.25	S
4	The need for basic scientific information about a variety of health contents areas.	0.26	S
B	**Competency in school health instruction**		S
5	Ability to interpret health education curriculum and syllabus	0.23	S
6	Ability to break the scheme	0.32	S
7	Ability to break the scheme into teachable units	0.37	S
8	Ability to formulate clearly defined objectives	0.39	S
9	Ability to plan and write comprehensive note of lesson.	0.41	S
10	Ability to demonstrate a sound knowledge of health education subject matter/content.	0.31	S
11	Ability to select and use relevant instructional material for teaching.	0.21	S
12	Ability to improve health education teaching materials	0.20	S
13	Ability to achieve to high degree of students involvement in the health education lesson	0.40	S
14	Ability to provide help when students encounter difficulties during practice work.	0.38	S
15	ability to respond to the student as an individual.	0.42	S
16	Ability to sustain student's interest while delivering health education.	0.46	S
17	Ability to use a wide variety of teaching methods in	0.364	S

	teaching health education.		
18	Ability to ask questions that will stimulate students' thinking during lesson.	0.28	S
19	Ability to maintain discipline while teaching	0.46	S
20	Ability to apply learning and teaching theories when planning and teaching.	0.48	S
21	Ability to select and use appropriate techniques for appraising the success of the health education lesson.	0.45	S
22	Ability to use a variety of evaluating procedure periodically to assess the effectiveness of students.	0.32	S
23	Ability to provide a variety of alternative solutions to health problems to enable students make wider decision	0.47	S
C	**Competency in school health service**		
24	Ability to identify and follow the policies and procedures in schools as regards to such matters as emergency care, accidents, disease control and referrals.	0.42	S
25	Ability to administer immediate care when accidents or illness to pupils occur	0.34	S
26	Ability to organize and carryout periodic health appraisal of students.	0.38	S
27	Ability to establish a systematic referrals programme.	0.41	S
D	**Competency in maintaining healthful school environment.**		
28	Ability to participate in activities that encourages good environmental health in the school.	0.31	S
29	Ability to develop good inter-personal relationship with students to enable them learn health task	0.51	S
30	Ability to develop inter-personal relationship among fellow teachers.	0.53	S
31	Ability to acquaint the students with the standard of hygiene, sanitation and safety needed in schools to provide a safety and healthful environment.	0.50	S
32	Ability to recognize hazardous conditions on the playground in the classroom and elsewhere in the school.	0.20	S
33	Ability to take appropriate action to the elimination or correction of hazardous conditions	0.33	S
34	Ability to examine and provide for adequate food services programme for the students and teachers.	0.25	S
E	**Competency in coordinating the school, home and community relationship.**		
35	Ability to provide health counseling to students as the case arises.	0.29	S
36	Ability to interpret to parents and students their health related problems	0.30	S
37	Ability to recognize activities that will help in the maintenance of both school, home and community sanitation.	0.40	S

38	Ability to develop a means of achieving cooperation among the school, home and community.	0.36	S
F	**Competency on the administration of health education programmes.**		
39	Ability to plan health education programmes	0.38	S
40	Ability to develop health policies, device health implementation strategies	0.31	S
41	Ability to understand the need for school health committees and willing to participate as a member	0.39	S
42	Ability to realize the importance of health coordinator, consultant or a person with administrative responsibility being the charge of the school health programme.	0.35	S
43	ability		
44	Ability to understand the need for in-service training for health education teachers.	0.27	S
45	Ability to supervise the general health education programme in the school	0.43	s

Data table 1 shows the range for the item-total correlation for CBRI. The range falls between 0.2000 to 0.529 indicating that 44 items are positively associated with the test. Also the table revealed that item 43 with value 0.0309indicted a value below 0.20. item 43 was not included in the CBRI because it was not up to the accepted range of 0.20 and above.

Table 2: Reliability Coefficient (Cronbach Coefficient Alpha) for CBRI and its Subscales

S/N	Subscales	Coefficient Alpha	No of items
A	General competency on health related issues	.3578	4
B	Competency on school health instruction	.7813	19
C	Competency on school heath services	.5612	4
D	Competency on maintaining health school environment	.5099	7
E	Competency on co-coordinating the school, home and community on health issues	.5090	4
F	Competency on administration of health education programmes.	.5252	6

Data in table 2: the correlation of CBRI and its subscales using computer's analysis. The internal consistency of the CBRI was .8364 based on the Cronbach Alpha, indicating a high value.

The table also revealed the reliability coefficient of the CBRI subscales which range between .3578 and .7813.

Table 3: a Table of Inter-Correlation Matrix of the Subscales of the CBRI

S/N	Subscales	A	B	C	D	E	F	CBRI
A	General competency on	1.000						
B	Competency on school health instruction	.331	1.000					
C	Competency on school health services	.100	.342	1.000				
D	Competency on maintaining health school environment	.223	.504	.437	1.000			
E	Competency on co-competency on co-ordinating the school, home and community on half issues	.100	.1.359	101	.399		1.00	
F	Competency on administration of health education programmes CBRI	.228	.771	.264	.403	.531	1.000	
	CBRI	.428	.813	.597	.775	.521	.581	1.000

Data in table 3, the inter-correlation matrix among the subscales of the CBRI. The overall correlation coefficient for CBRI subscales yielded .428; .813; 0587; .775; .521 and .587 respectively. Similarly, the other subscales correlated positively with itself and with a coefficient of 1.000.

Table 4: Kendall's Coefficient of Concordance 'W' for the Four Raters on CBRI

Sum of rank 1	Sum of rank 2	Sum of rank 3	Sum of ranks 4	Sum of ranks	T - squared
7872121	7923273	7910393	7894553	31600340	122979218.8

The above table 4, shows the sum of ranks for the raters on the CBRI with Rater 1's score 7872121, Rater 2's score 7923273, raters 3's score 7910393 and Rater 4's score 7894553 respectively. The Kendall's coefficient of concordance – "W" for the four raters on the CBRI was 0.88 indicating a high "W" and a high degree f relationship among four raters.

Discussion of findings

In respect to research question 1, the finding revealed that 44 items of the sum of rank out the 45 had an item total correlation 0.20 to 0.53. This finding is in line with Guilford (1954) recommendation that an item with total item correlation of 0.20 and above is indicative of discrimination power of the items that make up the test. It could seem appropriate to attribute the high percentages

of satisfactory items total correlation of CBRI items to the extensive validation by the experts used for the study.

The second research question sought to find out the reliability coefficient o the CBRI and its subscales. Data in table 2 revealed that the CBRI had a high reliability coefficient of 0.84 to 0.78. it should be noted however, that the internal consistency appreciate with increase ion the number of test items. The findings was in agreement with Nworgu (2003), who stated that the length of any test influences the magnitude of the reliability coefficient of that instrument. Also the table showed that the CBRI and its subscales with their moderate and high reliability coefficient indicate that the instrument was dependable, accurate and can be used to re-engineer the health teachers for effective teaching of health education. Data in table 3 which answered the third research question revealed that the inter-correlation among the different subscales of the CBRI indicated a low to moderate (.233 to .771) magnitude and positive in direction. The implication of this relationship is that relationship exists among the subscales and also between the subscales and the total instruments.

The fourth research question sought to find out the rater reliability coefficient of the four raters. The data revealed a high coefficient of .88 indicating rater agreement. This agreed with Ugochukwu (1991) who stated that raters agreement contributes to the meaningfulness of test scores and thus the reliability for the instrument. The high rater reliability indicated that the raters did not vary significantly among themselves in their ratings of the health education teachers using the CBRI. Rater reliability is important in measuring instrument where more than one rater is used.

Recommendations

On the basis of the findings of the present study, the following recommendations are made.

The use of the exiting proforma for evaluating health education teachers should be replaced with he CBRI by inspectors and supervisors of health education during their scheduled school inspections.

The use of CBI in evaluating teachers should be incorporated into the teachers training health education students' teachers' training programme or curriculum.

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