Vol 4 Issue 10 April 2015 ISSN No :2231-5063

International Multidisciplinary Research Journal

Golden Research Thoughts

Welcome to GRT

RNI MAHMUL/2011/38595 **ISSN No.2231-5063**

Golden Research Thoughts Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial board.Readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

International Advisory Board

Editorial Board

Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.aygrt.isrj.org

Golden Research Thoughts ISSN 2231-5063 Impact Factor : 3.4052(UIF)
Volume-4 | Issue-10 | April-2015 Available online at www.aygrt.isrj.org

DEVELOPMENT OF A QUESTIONNAIRE TO MEASURE PRIMARY SCHOOL STUDENT'S ACADEMIC ACHIEVEMENT IN SCIENCE LEARNING

S.S.Patil
Associate Professor, Department of Education, Kuvempu University, Jnanasahyadri, Shankaraghatta, Shimoga, Karnataka.

Co-Author Details :

Raghavendra H.Bommannavar
Junior Research Fellow, Department of Education, Kuvempu University, Jnanasahyadri, Shankaraghatta, Shimoga, Karnataka.

ABSTRACT:

We see very often that many students face difficulty in performing well in science. To find the difficulties faced by the students, the tests were not readily available. Since the tests which are available for the assessment of academic achievement in science of 7th standard was not found satisfactory. Hence the researcher developed a questionnaire that measuresacademic achievement of students in learning science.The initial tryout had 100 items. The scale was constructed by covering all the domains of science with four alternate answers in an objective type pattern (multiple choice). The items were evaluated for defects in language, vagueness and content with the help of experts.

The present research was conducted with 148 studentsenrolled at 7th standard from 6 government higher primary schools of shivamogga district varying in gender and achievements. TheCronbach's alpha for the entire questionnaire was 0.89; for each scale, alpha ranged from 0.70 to0.89. Findings of the study confirmed the validity and reliability of the academic test in science questionnaire. Implications for using the academic test in science in research and inclass are discussed in the paper.

KEYWORDS

Primary Students, Science Learning and Academic Achievement etc.

INTRODUCTION: -

Science education is concerned with the developing of technologically literate citizens who understand how science, technology, and society influence one another and who are able to use this knowledge in their everyday activities. Rein & Beach (1997) state the rationale of science education as follows; a study of science is important because it has the potential for improving the quality of life and making the world safer, empowers people, giving them greater control over their lives by providing path ways for finding answers to questions. Science education is also the field concerned with sharing science content and process, and the application of science and have transformed the world through dramatic advances in almost all fields including medicine, engineering, electronics, aeronautics etc. and in more recent time's dramatic leaps in computer technology have revolutionized in particular the information and communications sector (Hallinan and Sorensen, 1987). In this regard, strengthening their science curriculum standards China and India are two outstanding examples as they have grown to become economic and industrial powerhouses and in several ways compete effectively with developed countries (Hallinan and Sorensen, 1987). In line with this, the Malaysian Government had announced a new education policy to strengthen the education standards in science and technology to compete with advanced countries and vowed to stand in the list of developed countries in 2020 (Mahathir, 1991).These indicates that, many countries have given due attention to the effective implementation and practice of science education at their schools in general and at general secondary schools in particular.

Similarly, it is important to note that Ethiopia has placed education at the center of its strategies for development and decentralization, with strong polices promoting quality of educational provision (TGE, 1994). Definitely, the Ethiopian Government has also given emphasis on fields of science, mathematics and technology. Therefore, Ethiopia has to gear itself to provide the required training in scientific skills to meet the growing challenges of the world. Hence, the standards for science education provide expectations for the development of understanding for students through the entire course of general secondary school. This is because of science education is the fundamental one to the road of rapidly changing the world.

SCIENCE EDUCATION AND ACADEMIC ACHIEVEMENT

The goal of science education is to enhance all students' scientific literacy; that is, tohelp students grasp essential science concepts, to understand the nature of science, to realize the relevance of science and technology to their lives, and to willingly continuetheir science study in school, or beyond school (National Research Council [NRC]1996). Thus, research in science teaching and learning should address not onlystudent cognition, but also the affective component to cognition. It is only recentlythat researchers have started to stress the importance of affective components in studying students' concept learning (Duit and Treagust 1998, Lee 1989, Lee andBrophy 1996, Pintrich et al. 1993, Strike and Posner 1983, 1992, West and Pines 1983).

Today, science is more important and frequently used as a means to understand the options associated with development of technology. The future of the nation still depends to a large extent on a continuity in the development of its human and material resources for science and technological advancements. In recognizing the significance of (STM) Uche & Umoren (1998) stated that, "In the contemporary world, science and technology has become an integral part of human culture countries that ignore this significant truism is risking the future of its youths. If today's youths are not properly equipped with the rudimentary knowledge of modern science, they will grow up only to discover that

haphazard knowledge of science is not sufficient to understand the sophisticated operation of the present information age in science and technology (p.38). Having seen the role which science has to play in nation building educators are concerned about the need to improve students' academic achievement."

Research on students' academic achievement has generally taken the form of finding human or environmental variables which correlate with higher achievement and which can be used as predicators of achievement. Among the various variables identified is individual differences.

The study conducted to measure the school performance by considering pupil's score of science as dependent variable at PISA 2006. The sample of students used in PISA 2006 comes from a two-step random selection process. First, it was chosen a sample of schools in each country. Second, in each school was extracted a sample of 15 –years old students. As a result of this process, 400,000 students were randomly selected representing about 20 million from 57 participating countries. Each participating student spent two hours carrying out pencil-and-paper tasks. In contrast with other academic test, PISA includes some questions in which requiring students to construct their own answers as well as multiple-choice questions. Additionally,questionnaires about family background, learning habits and attitudes to science, school characteristics are implemented. This is an important feature of the test because of the reported gender gaps in academic achievement due to standardized test.

METHODOLOGY:Normative Survey was usedin the present study.

SAMPLE:For the pilot study the sample consisted of 148 studentsenrolled at 7th standard from 4 government higher primary schools of shivamogga district.

INSTRUMENT: This test is developed on the students of primary schools of Karnataka state who are studying science as a major subject prescribed by the government of Karnataka.

This construction was considered after the consultation & pooling of items on the following ground.

1.A text book of 7th standard science published by the DSERT, Govt. of Karnataka, Bengaluru.
2.Review of research and / or theoretical underpinnings.
3.Other similar tools.
4.Personal experiences of the investigator & subject teachers.

100 items were selected for initial try out covering all the areas of science with four alternate answers in an objective type pattern (multiple choice). These items were evaluated for defects in language, vagueness and content by senior lecturers of science from teacher education colleges. Table 1 shows the allocation of items in the initial try out of 100 items and their relative percentages.

Table 1: Showing the allocation of 100 items included in the preliminary draft of the test

Sl. No.	Branch	No. of items	Max. Scores	Percentage
1.	Physics	30	30	30
2.	Biology	42	42	42
3.	Chemistry	28	28	28
Total		100	100	100

After pilot study and item analysis, 20 items were dropped and the final form of the test was prepared with 80 items for maximum duration of 60 minutes.

Table 2: Showing the allocation of 80 items in the final form of the test.

Sl. No.	Branch	No. of items	Max. Scores	Percentage
a.	Physics	22	22	27.5
b.	Biology	37	37	46.25
c.	Chemistry	21	21	26.25
Total		80	80	100

SCREENING OF TEST ITEMS: This was done with a view to retain one of the synonymous items and the items which could fit into the framework of the competency. Items which were vague were discarded and remaining items were edited to make it clear.

WRITING OF DIRECTIONS: Suitable directions were given on the top of each item in each competency. Further, the mode of giving response to the various items to the competency was illustrated with specific example.

TRY OUT: For the initial try out as mentioned earlier 100 items were administered among 148 students of 6 primary schools of shivamogga district, Karnataka, India. The students were specifically informed about the purpose of the test administration such as:

a.The total time allotted for answering.

b.Purpose of the administration as research oriented

c.Need for sincere and honest answering to prepare a reliable to measure achievement. The honest and accurate answers of the students to test items would help the study in developing a reliable test in science.

SCORING OF THE INITIAL FORM: The test items were of objective type (multiple choice) questions. Therefore, one mark was awarded for each right answer. Thus, the theoretical range of sum of scores was between 0-80. Sum of the item scores gave the scores on performance in science. The score of each student was calculated separately.

ITEM ANALYSIS: Item wise analysis was carried out in the following way. All the test booklets on the basis of scores, were arranged in descending order to analyse the items for knowing the difficulty and discrimination index for each item. Investigator taken top 27% of the sample from the high scorers and 27% of the sample from the low scorers and remaining 46% of the sample from the average scorers were grouped.

By convention items with difficulty index higher than 25% and lower than 75% were retained. Similarly, items with index of discrimination above were retained. (The selection and rejection of the items in the present study were shown in the table 3.5 and 3.6)

Too easy and too difficult items with discriminative index above 0.30 and difficulty index ranging from 25% to 75% were selected and added to the final scale. Accordingly 80 items were selected out of 120 items and this constituted the final form of the test. The final tool consist of 80 items in all distribution of items in the final form as given in the below table. The selection of the items in the present study were shown in the table 3.5 and 3.6

RELIABILITY OF THE TEST: The reliability of a test is its ability to yield consistent result from one set of measure to another. It refers to the extent to which a measuring device yields consistent result upon testing and retesting. The test retest reliability of the test was worked out (with a test-retest interval of one month) by administering the test on a representative sample of 100 students. The Obtained coefficient of test-retest reliability is 0.85. Consistency reliability was calculated by Split-half method and it was found to be 0.81.

VALIDITY OF THE TEST: A test is valid one if it measures what it intends to measure or that it must measure the objective or such an aspect of objective as the test claims that it is measuring. It always refers to the purpose of the test. The validity of the test was calculated and it ranged from 0.87to 0.93.The reliability and validity coefficient confirms that the test is a reasonably dependable measure of Academic Achievement of Primary School Students of Shivamogga District.

CONCLUSION:

The scale to measure Achievement Test in Science developed and standardized by theauthors can be used to study the academic achievement in science of 7th standard students. This scale can be used effectively while measuring the academic achievement in science of higher primary school students irrespective of gender and achievement of students.

REFERENCES:

1.American Association for the Advancement of Science (1993). Benchmarks for Science Literacy. New York: Oxford University Press.
2.Duit, R., & Treagust, D. (1998). Learning in science — From behaviorism towards social constructivism and beyond. In B. Fraser and K. Tobin (Eds) International Handbook of ScienceEducation (pp. 3–26). Dordrecht: Kluwer Academic.
3.Hallinan, M. T., & Sorensen, A. B.(1987). Effects of ability grouping on growth in achievement. American Educational Research Journal, 23(4), 519-542.
4.Lee, O., & Brophy, J. (1996). Motivational patterns observed in sixth-grade science classrooms.Journal of Research in Science Teaching, 33(3), 585–610.
5.Mahathir, M., 1991. The way forward. Paper presented to the Malaysian Business Council. Retrieved fromhttp://vlib.unitarklj1.edu.my/htm/w2020.htm
6.National Research Council (1996). National Science Education Standards. Washington, DC: National Academy Press.
7.Rein Hartz, J. & Beach, M.D. (1997). Teaching and Learning in the Elementary school: Focus on curriculum. NewJersey: Prentice Hall.
8.Strike, K.A., & Posner, P.J. (1983). On rationality and learning: A reply to West and Pines. ScienceEducation, 67, 41–43.
9.Strike, K.A., & Posner, P.J. (1992). A revisionist theory of conceptual change. In R.A. Duschl andR.J. Hamilton (Eds) Philosophy of Science, Cognitive Psychology, and Educational Theory andPractise (pp. 147–176). Albany, NY: State University of New York Press.
10.Uche, S. C. & Umoren, G. U. (1998). Integrated science teaching: Perspectives and approaches. Aba: AAU VitalisBooks Co.
11.http://nces.ed.gov/pubs2008/2008016.pdf
12.http://www.nbbmuseum.be/doc/seminar2010/nl/bibliografie/opleiding/analysis.pdf

Publish Research Article
International Level Multidisciplinary Research Journal
For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper,Summary of Research Project,Theses,Books and Book Review for publication,you will be pleased to know that our journals are

Associated and Indexed,India

- International Scientific Journal Consortium
- OPEN J-GATE

Associated and Indexed,USA

- EBSCO
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Databse
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database
- Directory Of Research Journal Indexing

Golden Research Thoughts
258/34 Raviwar Peth Solapur-413005,Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com
Website : www.aygrt.isrj.org