NIGERIAN JOURNAL OF TEACHER EDUCATION AND TEACHING

ISSN 1117 - 1855

Vol. 1 No. 1

January, 2005

Publication of the Nigerian Primary and Teacher Education Association

ASSESSMENT OF TEACHER- TRAINERS' COMPETENCES IN THE USE OF SELECTED TEACHING METHODS IN BIOLOGY IN KANO STATE

Anthony Ossai Ukpene

Abstract

This study is an assessment of the competences of teacher- trainers in biology from three Colleges of Education in Kano State, on some selected teaching methods. The methods include lecture/expository, lecture/demonstration, instructional analogy, concept mapping, discovery/inquiry, guided discovery, field trip, project method, problem-solving, laboratory/experimentation and assignment, some of which have been recommended by experts as veritable strategies for effective teaching and learning of biology. It was observed that the respondents expressed greater competences for the lecture/demonstration and the laboratory/experimentation methods respectively. The paper recommends that the teacher-trainers should avail themselves of opportunities provided by conferences and workshops as well as journal publications and periodicals in order to enhance their level of competences in the 'difficult' methods of teaching.

Introduction

The lecture method seems to be the most commonly used method of instruction in Nigerian schools. Through it learners are encouraged to master course contents through constant repetition of facts and drills. The method ensures the completion of the course outline on time but incidentally it encourages learners to memorize and regurgitate contents of learning experiences. The re-orientation of the nation's Philosophy of Education to achieve national development through science and technology education brought to the fore, the absolute inadequacies observable in the lecture method .Closely associated with the inadequacies is the increase in students' enrollment in biology classes (Okebukola, 1984; James & Awodi, 1997) which has culminated in poor level of students' performances in external public examinations. To reduce underachievement among students, several authorities have suggested some scrupulous methods of teaching and learning. For instance, Ajewole (1990), noted that the guided discovery method is significantly better in the transfer of learning experiences, in which the teacher provides illustrative materials for students to study on their own after which leading questions are asked to guide the students to think through the problem, provide solutions, and draw conclusions through adopting the processes of science. For Nwagbo 1999, and Nwagbo 2001, guided inquiry method is viable for the effective blending of theory and practical works, and for promoting cognitive achievement in biology among students at all levels of scientific literacy. For slow learners in biology, the inquiry method is highly effective in yielding higher cognitive achievement (James and Awodi, 1997), while the problem solving method allows students to perform mental processes such as observing, classifying, measuring, forming hypothesis and analyzing which lead to discovery and generalization. It is a method in which the teacher acts as guide and moderator of learning experiences, helping students to further their inquiries and encourage them to tackle instructional problems on their own (Ogunniyi, 1986, in Yunusa, 2003).

Of late, the Science Teachers Association of Nigeria advocated the use of concept mapping in science teaching. This is a graphical arrangement of key concepts to show meaningful relationships among the selection of concepts to be studied. While it enables teachers to select, organize, and represent subject matter content in a concise manner, it

builds in learners the ability to summarize and synthesize what they are studying.

As cited in Ukpene (2004), teachers, especially teacher-trainers through whom science and technology education is supposed to be developed in the country should be intellectually and professionally competent and dynamic enough to adapt to the dynamic world of today's scientific and technology growth and development. This will enable them to embrace new methodologies that have been suggested for effective lesson delivery. The biology lecturers in Colleges of Education are the teacher-trainers as used in this paper.

Statement of Problem

Although experts to improve the quality of teaching and learning in biology have suggested several methods of teaching, it is observed that some teachers are still very reluctant in embracing them. Rather, in their course of teaching, they still make predominant use of the talk and chalk method which was observed by Nwagbo (2001), not to be viable any longer as a method of attaining the goals of instructional objectives in biology. In this paper it is therefore intended to:

- Find out whether teacher-trainers in biology are aware of the diverse methods available for teaching the subject.
- Examine whether they are competent enough in the suggested methods of teaching.
- Find out which methods are mostly used by the teacher-trainers for lesson delivery.

Research Questions

- Are the teacher-trainers aware of the diverse methods of teaching that have been suggested through research findings?
- Are the teacher-trainers competent enough in the methods to use them?
- Do they (teacher-trainers) make use of the diverse methods of teaching to improve the quality of instructions?

Method

The population for this research consists of the biology lecturers in 3 Colleges of Education in Kano State. The sample is made up of 26 biology lecturers that were randomly selected as follows: Federal College of Education Kano 15, State College of Education Kumbotso 6, Federal college of Education (Tech.) Bichi - 5.

The research instrument used in the study was a questionnaire, which was adapted from Osuafor (1999). It contained a list of several methods of teaching and the respondents were requested to indicate which methods they are aware of (that is, the ones they have heard of before), to indicate whether they are competent enough in the methods, and also to tick the ones that they used most often for lesson delivery. The instrument was administered on different days and collected three days after in each case.

Results

The following keys are used in the table:

A= Methods the teacher-trainers are aware of.
C= Methods the teacher trainers are competent in.
U= Methods used by teacher-trainers for lesson delivery/training of students
n= Number of respondents in each College.

Table I: Competences of Teacher-Trainers on Different Methods of Teaching Biology

	Teaching Methods	Bichi n = 5			Kano n = 15			Kumbotso n = 6			Total n = 26			Percentage		
		A	C	U	A	C	U	A	C	U	A	C	U	A	C	U
1	Lecture/expository	4	2	2	11	6	5	2	2	2	17	10	9	65.38	38.46	34.62
2	Lecture/demonstration	5	4	4	14	12	12	6	5	5	25	21	21	96.15	80.77	80.77
3	Instructional analogy	2	1	-	3	1	1	1	1	1	6	3	2	23.08	11.54	7.69
4	Concept mapping	1	-	-	3	2	-	2	2	2	6	4	2	23.08	15.39	7.69
5.	Discovery/inquiry	4	-	-	9	3	1	3	2	1	16	5	2	61.54	19.23	7.69
6	Guided discovery	4	-	-	7	6	-	3	-	-	14	6	-	53.85	23.08	-
7	Field trip	5	1	1	11	6	4	3	2	2	19	9	7	73.08	34.62	26.92
8.	Problem-solving	3	2	2	7	6	3	4	4	2	14	12	7	53.85	46.15	26.92
9.	Project method	1	1	1	7	7	7	4	4	4	12	12	12	46.15	46.15	46.15
10.	Laboratory/experimentation	3	2	2	9	9	8	4	4	3	16	15	13	61.54	57.69	50.00
11	Assignment	5	3	2	9	8	8	3	2	2	17	13	12	65.38	50.00	46.15

Discussion

The study notes that the respondents have variable level of awareness for the different methods of teaching investigated. Greater awareness for teaching methods such as lecture/expository (65.38 percent), lecture/demonstration (96.15 percent), discovery/inquiry (61.54 percent), laboratory/experimentation (61.54 percent), assignment method (65.38 percent) and field trip (73.08 percent), was recorded. A moderate level of awareness for the project method (46.15 percent), guided discovery (53.85 percent) as well as the problem-solving method (53.85 percent) respectively was equally observed. Conversely, only 6, representing a low percentage of 23.08 of the teacher-trainers claimed to be aware of instructional analogy and concept mapping as teaching methods.

Despite the varying degrees of acclaimed awareness for the teaching methods studied, outstanding competences were expressed only for the lecture/demonstration (80.77 percent). The teacher-trainers expressed a moderate competency level for laboratory/experimentation (57.69 percent), assignment method (50.00 percent), project and problem-solving methods with 46.15 percent respectively. However, low competences were expressed by them for guided discovery (23.08 percent), discovery/inquiry (19.23 percent), concept mapping (15.39 percent) and instructional analogy (11.54 percent), and consequently, the methods are least used by the teachers for teaching. As could be ascribed from the expressed level of competences, an overwhelming 80.77 percent of the teacher trainers deliver their lessons using the age-long lecture/demonstration method, which Nwagbo (2001), described as easy, but inadequate and inappropriate. Although the project and assignment methods present moderate appeals for usage by the teacher-trainers during lesson delivery, the methods encourage a compartmentalized, rather than a comprehensive coverage of the subject curriculum.

Summary of Findings

The findings of this study are summarized as follows:

1. In Colleges of Education in Kano State teacher-trainers in biology have varying levels of awareness on the various methods suggested for teaching biology for better achievement of instructional goals of learning experiences.
2. Some teacher-trainers in biology in the Colleges investigated do not posses adequate competences on some teaching methods such as instructional analogy, concept mapping, discovery/inquiry and guided discovery.
3. Some of the teacher-trainers still depend largely on the lecture/demonstration and the laboratory/experimentation methods respectively for lesson delivery.

4. Some of the teaching methods recommended by experts as viable means of teaching and learning biology are not utilized by some teacher-trainers in the Colleges of Education in Kano State due to lack of competences in them.

Recommendations

1. Relevant professional/learned societies should organize workshops on the teaching methods for which the teacher-trainers show low or moderate competences in order to elucidate on their applications. The teacher-trainers should endeavour to sponsor themselves to such workshops instead of waiting for corporate sponsorship, which seldom comes nowadays.
2. The teacher-trainers should not discard veritable methods of teaching recommended by experts, simply on the premise that the underlying principles are not clearly understood. Rather such methods should be tried out first on peer groups before being applied to the whole class.

Conclusion

It might portend a gloomy future for biology education in particular and the teaching profession in general when the educators that are saddled with the responsibility of producing competent teachers to sustain the national desires for a sound science and technology education are themselves not versatile in some of the methods to be learned, mastered and utilized by the recipients of instructions in Colleges of Education. The teacher-trainers should therefore avail themselves of the opportunities provided by professional academic conferences and workshops, research findings in journals and periodicals so as to beef up their level of competences on the various methods of teaching that have been recommended for the effective delivery of learning experiences in biology.

References

Ajewole, G. A. (1990). Effects of Guided-Discovery and Expository Instructional Methods on Students Transfer of Learning. *Journal of the Science Teachers Association of Nigeria*.2 6(2).5 9- 66.

James, T. & Awodi, S. (1997). The Relative Effects of Inquiry and Lecture Methods on the Performance of High and Low Achievers in Senior Secondary School Biology. *Journal of the Science Teachers Association of Nigeria*. 36(1 and 2) 43-51.

Nwagbo, C. (1999). Effects of Guided Discovery and Expository Teaching Methods on the Attitude Towards Biology of Students of Different Levels Scientific Literacy. *Journal of the Science Teachers Association of Nigeria*. 34(1&20) 66-73.

Nwagbo, C (2001). The Relative Efficacy of Guided Inquiry and Expository Methods on the Achievement in Biology Of Students in Different Levels of Scientific Literacy. *Journal of the Science Teachers Association of Nigeria*. 36(1 & 2) 43- 51.

Okebukola, P. A. (1984). Tackling The Problem of Large Classes in Biology. An Investigation Into the Effects of a Cooperative Learning Approach. *Journal of the Science Teachers Association of Nigeria*. 22 (2) 73-77.

Ukpene, A. O. (2004). Attitudes of Biology Teachers to Research and Research Findings. (135 140). In. M.A.G. Akale (Ed.). *Proceedings of the 45th Annual Conference of STAN.*

Yunusa, M.S.(2003). Problem-Solving Strategy. An innovation for Effective Teaching and Learning of Biology. *Isa-Kaita Multidisciplinary Journal of Education, Dutsin-ma.* 1(1)126-129.