The Zambia Mathematics Pre-service Programme: Its Ability To Impart Teaching Strategies And Classroom Management Skills As Perceived By Its Graduates.

C. D. Kasanda[1]
Department of Educational Design and Methods
University of Namibia

Abstract

The study being reported in this article was carried out in 1989 as part of a wider research on the evaluation of the pre-service mathematics programme at the Copperbelt Secondary Teachers College (COSETCO) in Zambia.

Specifically, this report focuses on the perceptions of 227 former students of the College regarding the pre-service programme's ability to impart both teaching strategies and classroom management skills. The subjects' responses on the 10 Likert type statements addressing these two aspects show that former students of COSETCO generally perceive the programme as imparting useful different teaching strategies and classroom management skills to it's graduates.

Introduction

Perceptions of an event, object or programme may be understood to imply an awareness of it's existence. De Cecco (1968) indicates that our

1 *The evaluation of the COSETCO pre-service mathematics programme was carried out by C.D. Kasanda and K.M. Joseph of the University of Zambia. The author is responsible for the views expressed in this paper.*

perceptions of events help in the formulation of appropriate concepts about that experience. While Darley, Glucksberg, Kamin & Kinchla (1981) view perceptions of an event as our educated guesses about the world we live in based on our prior experiences. Both De Cecco (1968) and Darley et al (1981) underscore the importance of an individual having had an experience of something before they can formulate any such perceptions need not be uniform for any one group of individuals (Luft, 1969).

The study being reported in this paper was an attempt to determine the perceptions of the mathematics teachers; programme by former students at the Copperbelt Secondary Teachers' College (COSETCO) in Zambia. Specifically, this report focuses on the subjects' perceptions of the programme's ability to impart both teaching strategies and classroom management skills to trainee teachers.

The COSETCO is one of the two secondary teacher training colleges in Zambia offering a two year pre-service mathematics teacher training programme. The other college is Nkrumah Teacher Training College in Kabwe. The study being reported in this paper was a case study of COSETCO.

Method

Population

The target population for this study comprised of mathematics teacher in Zambia secondary schools who had graduated from the college from 1977 to 1988. During this period the college had graduated about 1500 mathematics teachers.

Subjects

The subjects for this study comprised of 227 male and female former students of the college. These had gone through the two year secondary mathematics pre-service programme of the college and were at the time of the study teaching mathematics in various parts of the country.

The subjects' ages ranged from 20 years to 35 years and their teaching experience ranged from one to 14 years.

Instruments

The research instrument comprised of a four section 32 item Programme Perception Questionnaire. The questionnaire was constructed by the researchers and was of the Likert statement type. Respondents were requested to indicate their agreement with each statement by choosing one of the five alternatives: strongly agree, agree, not sure, disagree and strongly disagree.

Procedure

Ten questionnaires were either hand delivered or mailed to 31 Heads of the Mathematics departments in secondary schools around the country. The Heads of Departments were requested to distribute these questionnaires to mathematics teachers in their departments who had gone through the mathematics programme at the college to complete. Two hundred and twenty seven questionnaires duly completed were returned in the self addressed and stamped envelopes which had been enclosed with the questionnaires to facilitate return of the questionnaires.

The returned 227 completed questionnaires represented a response rate of 79.6%. Out of the 310 questionnaires sent out 20 were returned uncompleted because some secondary schools did not have on their staff a mathematics teacher who had graduated from the COSETCO. Five other duly completed questionnaires were not included in the final analysis because they had been completed by mathematics teachers who had graduated from Nkrumah Teacher Training College.

Results

The data collected from the 227 respondents regarding their perceptions of the COSETCO mathematics pre-service programme were analysed and are presented in Table 1.

TABLE 1: RESPONDENTS' RESPONSES TO THE 10 ITEMS DEALING WITH TEACHING STRATEGIES AND CLASSROOM MANAGEMENT SKILLS.

STATEMENTS	STRONGLY AGREE	AGREE	NOT SURE	DISAGREE	STRONGLY DISAGREE	NO RESPONSE
1. Different strategies of teaching Maths	102 (44.9%0	109 (48.0%)	4 (1.8%)	4 (1.8%)	4 (1.8%)	4 (1.8%)
2. How to make teaching aids from locally obtained materials	54 (23.8%)	119 (52.4%)	13 (5.7%)	31 (13.7%)	10 (4.4%)	0
3. Ways of coping with stresses of teaching in Secondary schools	41 (18.1%)	101 (44.5%)	47 (20.7%)	27 (11.9%)	10 (4.4%)	1 (0.4%)
4. How to effectively cater for pupils individual differences in classroom	103 (45.4%)	109 (48.0%)	6 (2.6%)	7 (3.1%)	2 (0.9%)	0
5. The use of commercially produced teaching aids	29 (12.8%)	114 (50.2%)	34 (15.0%)	31 (13.7%)	17 (7.5%)	2 (0.9%)
6. Different methods of evaluating pupil learning	91 (40.1%)	115 (50.7%)	10 (4.4%)	7 (3.1%)	4 (1.8%)	0
7. How to competently assume different roles in the school	45 (19.8%)	102 (44.9%)	35 (15.4%)	38 (16.7%)	5 (2.2%)	2 (0.9%)
8. Methods of diagnosing pupil learning difficulties	73 (32.2%)	112 (49.3%)	22 (9.7%)	15 (9.7%)	5 (2.2%)	0
9. Proper ways of using the chalkboard	129 (56.8%)	85 (37.4%)	7 (3.1%)	4 (1.8%)	1 (0.4%)	1 (0.4%)
10. Remedial techniques to enhance pupil understanding	44 (19.4%)	141 (62.1%)	14 (6.2%)	14 (16.2%)	3 (1.3%)	0

Table 1 gives the responses of 227 graduates on section 1 of the Programme Perception Questionnaire. This section had 10 items and sought information regarding the extent to which student teachers at the college were taught different teaching strategies and other class management skills in order to enhance learning in their mathematics classes.

Discussion Of Results

Teaching Strategies and Classroom Skills

Teaching strategies and class management skills are essential for effective classroom learning to take place and for class control. Without these skills teaching becomes ineffective and a chaotic classroom environment detrimental to learning may occur.

From the results presented in Table 1 it appears that the former COSETCO pre-service mathematics students perceive the programme to have achieved the objectives of providing trainees with the necessary skills to make them become better and effective teachers of mathematics for the Zambian secondary schools. This conclusion is based on the responses of the 227 subjects.

As can be noticed in Table 1, two hundred and eleven (92.9%) of the respondents agreed with the statement that different teaching strategies of teaching mathematics are taught to students at the college. This high agreement level by the former students of the college has the implication that COSETCO trained mathematics teachers should be able to exercise flexibility in their teaching, and should be able to use different teaching methods as the situation demands in the classroom. Nevertheless, eight candidates disagreed with the statement.

Respondents were also requested to indicate the extent to which the COSETCO mathematics programme encouraged the use of teaching aids and their production from local materials. The use and importance of teaching aids in the mathematics classroom can not be over emphasized. Use of concrete materials if used judiciously by the teacher often makes abstract concepts in mathematics more tangible and easily grasped (Johnson & Rising, 1972; Servais & Varga, 1971; Sydam & Dessart, 1976; Krulik & Weise, 1975; Farrant, 1964).

It is therefore, gratifying to note that one hundred and seventy three respondents (73.2%) agreed with the statement that at the college students were taught the use of teaching aids and their production from local materials. Only about 18.1% of the subjects chose either disagree or strongly disagree for this item. The response of the former COSETCO mathematics students to this statement is important in that if teaching aids are found in the school to which these teachers are posted, they would be able to make use of them in order to make their pupils learn mathematics. Further, the production of such teaching aids from locally obtained materials ensures that even when these teachers are posted to remote secondary schools in the country they would be able to make and use such aids because they have the skill. Indeed few schools in the country can afford to buy commercially produced teaching aids owing to poor government funding for school requisites and the high inflation in the country.

The ability to use teaching materials is further supported by statement five on the questionnaire. Respondents were requested to indicate the extent to which they agreed with the statement, that while at college they were taught the use of commercially produced teaching aids. One hundred and forty three respondents (63.0%) as opposed to 48 (21.2%) agreed with the statement. It is gratifying to note that besides being able to make teaching aids from locally obtained materials COSETCO graduates can confidently handle different commercially produced ones, if available in the schools to which they may be posted upon graduation from the college.

Stress reduces an individual's performance on job related tasks. In teaching, stress may have the effect of reducing a teacher's ability to effectively prepare and present the material to the class. The overall result of this inability is poor teaching or ineffective teaching which in turn results in poor or ineffective learning by the class. Accordingly, the responses of former COSETCO students on this statement show that trainee teachers are taught ways of coping with work related stress. A total of 142 (62.6%) respondents agreed with the statement, (i.e., chose strongly agree and agree) while 37 (16.3%) disagreed with the statement. Nonetheless, it is surprising that 47 (20.7%) of the 227 respondents chose the response "Not Sure". The most plausible explanation to this apparent anomaly is that probably some candidates in a particular year might not

have been taught ways of coping with stress. It is not possible from the results of this study to pinpoint the reason, given that the respondents had been at the college at different times. However, it seems clear that students are exposed to stress coping methods to enable them perform at a higher level in their teaching by effectively avoiding stressful situations and the skillful management of stress.

Further, the fact that trainee teachers are taught how to competently assume different roles in the classroom (Table 1, statement 7) is a possible pointer to the fact that they may have been taught ways which could help them manage stress related situations in actual teaching. Indeed 147 (64.8%) respondents supported the statement while 41 (18.8%) disagreed.

Classroom teaching must cater for student needs. According to Krulik & Weise (1975) and Johnson & Rising (1972) no two students are the same. As such, classroom teaching should take into consideration pupils' individual differences to enhance learning of mathematics. It is gratifying to note that 212 (93.4%) of the respondents agreed with statement 4 which requested them to indicate the extent of their agreement on whether they were taught ways of catering for individual differences. It is hoped that COSETCO trained teachers do put these methods in use after graduation.

Statements 8 and 10 address essentially the same thing. That is whether the subjects were taught ways of diagnosing pupil learning difficulties (statement 8) and different remedial techniques to enhance pupil understanding of mathematics (statement 10). Table 1 shows that 185 (81.3%) and 189 (81.5%) of the respondents agreed with statements 8 and 10, respectively, and that only 20 (8.8%) and 17 (7.5%) disagreed with the two statements, respectively. It is therefore, safe to conclude that, COSETCO graduates are taught methods of identifying learning difficulties and how to cater for these difficulties to bring about learning in the pupils under them. Indeed, these skills are essential for any teacher to reach the slow learner and others who may lag behind the whole class due to other reasons.

Conclusion

The effectiveness of a teachers' training programme is often judges by how the graduates perform in the classroom thereafter. Although different strategies of teaching mathematics and how to provide for individual differences could have been taught to them during their college days, their applicability depends upon the individual teacher and the situation prevailing in their workplace. It suffices to note that the COSETCO mathematics programme appears to be exposing trainee teachers to numerous strategies of teaching mathematics to a cross section of the Zambian secondary school population and equipping trainee teachers adequately for the hard task of teaching. Indeed, the discernible trend for all ten items is general agreement with the statements.
Further, it may be concluded from the findings of this study that the former COSETCO students perceive the Mathematics programme at the college as worthwhile.

References

Darley, M.J. Glucksberg, S., Kamin, L.J. & Kinchla, R.A. (1981). *Psychology.* 2nd Ed. New Jersey. Prentice Hall.

De Cecco, J.P. (1968). *The Psychology of Learning and Instruction: Educational Psychology.* New Jersey. Prentice Hall.

Farrant, J.S. (1964). *Principles and Practice of Education.* London. Longman.

Johnson, D.A. & Rising, G.R. (1972). *Guidelines for Teaching Mathematics.* California. Wadsworth Publishing.

Kasanda, C.D. & Joseph, K.M. (1989). Perceptions of the COSETCO mathematics programme by former students. Unpublished report. Lusaka. UNZA.

Krulik, S. & Weise, I.B. (1975). *Teaching Secondary School Mathematics.* Philadelphia. W.B. Saunders.

Luft, J. (1969). *Of Human Interaction.* California. Mayfied Publishing.
Servais, W. & Varga, T. (Eds.) (1971). *Teaching School Mathematics.* Harmondsworth. Penguin Books.

Suydam, M. & Dessart, D. J. (1976). *Classroom Ideas from Research on Computational Skills.* Virginia. NCTM.