

EVALUATION OF THE SEMINAR/WORKSHOP

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Introduction

Evaluation is looked upon in different ways by different people. But basically, evaluation of educational programmes is undertaken to clarify issues. Alkin (1970) refers to evaluation as the process by which relevant data are collected and transformed into information for decision making. Because evaluation normally implies use of systematic processes of data collection, it has also been referred to as 'objective reporting'. Objectivity is a key issue in any evaluation process.

This workshop is the third in the series of similar workshops, and all the agencies involved in the planning, organization and execution are interested in objective reporting. No reports exist of any formal evaluation of the earlier workshops, and it was considered necessary to formally evaluate this third workshop to obtain, among other things, the perception of the participants with regard to this and future workshops. Information so obtained will be useful to the Commonwealth Secretariat and perhaps to other organizations in planning similar workshops in future.

Data for this evaluation were obtained by means of a questionnaire administered to all the participants at the end of the workshop. A copy of the questionnaire is as shown on pages 83 to 87.

Results

Of the 21 participants who submitted completed questionnaires, ten (i.e. 47.62%) were university graduates and 11 (i.e. 52.38%) were not. The working experience of the participants ranged from one to 15 years. A number of the participants were attending an international seminar on low-cost equipment for the first time. Table 1 shows the frequency of attendance at national and international seminars on low-cost science teaching equipment.

Table 1: Attendance at Low-Cost Science Teaching Equipment Seminars

Frequency	National		International	
	No. attended	%	No. attended	%
Never	8	38.10	0	0.00
Once	6	28.57	20	95.24
Two times	3	14.28	1	4.76
Three times	0	0.00	0	0.00
More than three times	4	19.05	0	0.00
Total	21	100.00	21	100.00

Table 2 shows a summary of how information about the workshop reached the participants.

Table 2: Information about the Workshop

Method	No. of Participants	%
Contacted by National Ministry of Education	14	66.67
Contacted by Commonwealth Secretariat	4	19.05
Contacted by National Government	1	4.76
Contacted by Academic Institution	1	4.76
Contacted by National Science Teachers' Association	1	4.76
Total	21	100.00

The participants who came to the workshop were either sponsored by their national government or by the Commonwealth Secretariat. Table 3 shows the degree of sponsorship of participants.

Table 3: Agency Responsible for Sponsorship to Workshop

Specification	Sponsor			
	Commonwealth Secretariat		National Government	
	No. sponsored	%	No. sponsored	%
Round trip fare	13	61.90	8	38.10
Hotel accommodation	14	66.67	7	33.33
Feeding	14	66.67	7	33.33

Although this workshop was supposed to be a regional one, participants had to travel long distances to arrive at the workshop venue. They used two different means of transportation - air and road. Table 4 shows how the participants travelled to the workshop.

Table 4: Mode of Travel to Workshop

Method	Number of Participants	%
By air	20	95.24
By road	1	4.76
Total	21	100.00

The second part of the questionnaire focused attention on specific aspects of the workshop. In particular, participants were asked to give their opinions on facilities provided during the workshop, their assessment of the lead papers and the laboratory sessions. Table 5 shows a summary of participants' ratings of the workshop facilities.

Table 5: Participants' Ratings of Workshop Facilities

Specific Aspects	Good(3)		Fair(2)		Rating Poor(1)		Mean
	No.	%	No.	%	No.	%	
Arrangement for obtaining travel ticket	17	85.00	2	10.00	1	5.00	2.80
Arrangement for meeting participants on arrival	16	80.00	3	15.00	1	5.00	2.75
Hotel accommodation	9	45.00	9	45.00	2	10.00	2.35
Arrangement for visits to schools	11	57.89	8	42.11	0	0.00	2.58
Arrangements for excursions	10	50.00	8	40.00	2	10.00	2.40
Daily transportation	11	52.38	9	42.86	1	4.76	2.60

Tables 6, 7, and 8 give summaries of the participants' ratings on the three lead papers.

Table 6: Participants' Rating of Lead Paper 1*

Specific Aspect	Adequate/Satisfactory (3)		Rating Fair (2)		Inadequate/Unsatisfactory (1)		Mean
	No.	%	No.	%	No.	%	
Content	13	61.91	7	33.33	1	4.76	2.57
Presentation	14	70.00	6	30.00	0	0.00	2.70
Time allocation for presentation	13	68.42	6	31.58	0	0.00	2.68
Time spent on group discussion	12	63.16	7	36.84	0	0.00	2.63
Presentation of group reports	17	80.95	4	19.05	0	0.00	2.81
Time spent on plenary discussion	14	66.67	7	33.33	0	0.00	2.67

* Title: Low-Cost Science Teaching Equipment: Training for Production

Table 7: Participants' Rating of Lead Paper 2*

Specific Aspect	Rating						Mean
	Adequate/Satisfactory (3)		Fair (2)		Inadequate/Unsatisfactory		
	No.	%	No.	%	No.	%	
Content	16	76.19	5	23.81	0	0.00	2.76
Presentation	16	76.19	5	23.81	0	0.00	2.76
Time allocation for presentation	19	90.48	2	9.52	0	0.00	2.90
Time spent on group discussion	15	71.43	6	28.57	0	0.00	2.71
Presentation of group reports	14	66.67	7	33.33	0	0.00	2.57
Time spent on plenary discussion	13	61.90	8	38.10	0	0.00	2.62

* Title: Low-Cost Science Teaching Equipment: Training for Use

Table 8: Participants Rating of Lead Paper 3*

Specific Aspect	Rating						Mean
	Adequate/Satisfactory (3)		Fair (2)		Inadequate/Unsatisfactory		
	No.	%	No.	%	No.	%	
Content	18	90.00	2	10.00	0	0.00	2.90
Presentation	14	70.00	6	30.00	0	0.00	2.70
Time allocation for presentation	13	68.00	6	31.58	0	0.00	2.68
Time allocation for discussion	12	60.00	7	35.00	1.0	5.00	2.55

* Title: Commonwealth Co-operation in Education, with Special Reference to Science Teaching Equipment

A major part of the time spent during the workshop was devoted to the practical laboratory sessions in which participants were guided in the making of simple science teaching equipment. Table 9 gives a summary of the participants' rating of the laboratory sessions.

Table 9: Participants' Rating of Laboratory Session

Specific Aspects	Satisfactory/ Useful or Adequate (3)		Rating				Mean
			Fair		Unsatisfactory/ Not Useful or Inadequate		
			No.	%	No.	%	
Organization	9	47.37	10	52.63	0	0.00	2.47
Experience gained	16	80.00	4	20.00	0	0.00	2.80
Tools provided	18	90.00	2	10.00	0	0.00	2.90
Materials provided	19	95.00	1	5.00	0	0.00	2.95

The third part of the questionnaire sought to obtain the perception of the participants on low-cost science equipment in general. Statements about production and use were presented to the participants and they were expected to react to each on a three-point scale - agree, not sure, disagree. Table 10 summarizes the reaction of the participants to the 15 statements.

Table 10: Participants' Perception of Low-Cost Science Equipment

Statement	Rating		
	Agree %	Not sure %	Disagree %
1. Low-cost science equipment will be inadequate for teaching Primary Science in my country	0.00	9.52	90.48
2. Low-cost science equipment will be <u>adequate</u> for teaching <u>High School Science</u> in my country	61.90	19.05	19.05
3. At the present moment, the production of low-cost science equipment will be feasible in my country	57.14	42.86	0.00
4. Teachers in my country will not be enthusiastic in the use of low-cost science equipment	5.00	40.00	55.00
5. The use of low-cost science equipment will help students become interested in further work in science	80.95	19.05	0.00
6. The use of low-cost science equipment will make science more relevant to the environment of the learner	90.48	9.52	0.00
7. Teachers in my country are not sufficiently trained to use low-cost science equipment	57.14	28.57	14.29

Continuation of Table 10

Statement	Rating		
	Agree %	Not sure %	Disagree %
8. In-service workshops should be frequently organized for teachers who use low-cost science equipment	90.48	4.76	4.76
9. Classroom science teachers should be involved in the mass production of low-cost science equipment	60.00	10.00	30.00
10. Results obtained using low-cost science equipment are grossly inaccurate	0.00	35.00	65.00
11. Low-cost science equipment should only be used in Teacher Training Colleges	0.00	0.00	100.00
12. The use of low-cost science equipment is inappropriate in industrially advanced countries	4.76	23.81	71.43
13. The production of low-cost science equipment should NOT be undertaken at the regional level but at the national level	42.86	14.29	42.86
14. Low-cost science equipment is not suitable for practical <u>examinations</u>	4.76	23.81	71.43
15. Low-cost science equipment leads to a <u>cheap</u> but ineffective way of teaching science	14.29	4.76	80.95

The fourth part of the questionnaire dealt with the free-response type of questions. Six questions about the workshop were presented to the participants who were asked to respond freely. While an attempt was made to extract all the information provided in the responses, only a summary of statements with appreciable frequency (i.e. above 30%) are included in this evaluation report.

FREE RESPONSE

- Question 1. What is it you like best in this workshop?
- (i) Opportunity to exchange ideas on low-cost equipment.
 - (ii) Opportunity to learn how an international workshop on low-cost science equipment is organized.
 - (iii) Opportunity to learn more about the Commonwealth Secretariat.
 - (iv) Opportunity to learn at first hand how low-cost science equipment is produced.

Question 2.

What is it you dislike most in this workshop?

- (i) Long sessions until 5.30 - 6.00 p.m.
- (ii) Important discussion coming up at end of day when participants are tired.
- (iii) Inability of Commonwealth Secretariat staff to be more involved in the sessions.
- (iv) Wasting of time before catching the bus in the mornings.
- (v) The time-table was too tight.

Question 3.

What is it you would have liked to see done in this workshop which was not done?

- (i) More field trips to PNG schools to enable the participants to appreciate fully the problems of using low-cost science equipment in PNG schools.
- (ii) Evaluation of materials produced not done in actual PNG schools.
- (iii) More time needed for discussion of 'mass production' of low-cost science equipment.
- (iv) Bringing of more models and prototypes from various countries.
- (v) More group discussion on current science education problems of the South Pacific Region.
- (vi) More emphasis given to the construction of charts and models.
- (vii) More discussion with consultants on problems and experiences with low-cost science equipment in teacher training.

Question 4.

What would you suggest for inclusion in a workshop of this nature in future in the Pacific?

- (i) A taste of PNG traditional life especially for participants from other countries.
- (ii) Evaluation Reports of previous workshops to be provided.
- (iii) More time for production of equipment.
- (iv) More demonstration of techniques and use of various low-cost equipment.
- (v) More papers from countries on how the problems of production and use of low-cost science equipment were solved.

- (vi) A session on curriculum development strategies.

Question 5. How useful has this workshop been to you personally?

- (i) Realization of problems of other countries on production of low-cost science equipment - 'we are not alone'.
- (ii) Gained an insight into the need of in-service science workshops for teachers.
- (iii) The experience of the workshop is directly relevant to my present schedule in the Ministry of Education.
- (iv) Gained some knowledge of life in PNG.

Question 6. What would you plan to do as a follow-up to this workshop in your country?

- (a) In your official capacity?
 - (i) Making recommendations to our home government especially on the need to support a regional centre for production of low-cost equipment.
 - (ii) Setting up of training programmes for science teachers.
- (b) In your professional capacity?
 - (i) Publicizing the outcome of this workshop by writing articles on low-cost science equipment in professional journals.
 - (ii) Organizing Science Teachers' Associations with a view to disseminating information on low-cost science equipment to many more practising teachers.
 - (iii) Exploring the possibility of recommending the bulk buying of science equipment for schools.

Concluding Remarks

This evaluation has highlighted a number of issues based on the response of participants contained in the completed questionnaires.

The workshop can be said to be successful if one examines the extent to which the goals of the workshop have been met. Participants became aware, more than ever before, of the problems and prospects of low-cost science teaching equipment. The need to underscore the applicability of the main concept of low-cost equipment in third world countries was clearly brought out. Of significance is the fact that an awareness in the need to co-operate, be it at regional or international levels, was demonstrated. It is to be hoped that formation of regional centres for the production and procurement of low-cost science teaching equipment will result, and that the day will not be far when children in third world countries will be involved in

'sciencing' - that is being actually involved in doing science - instead of being told about science. That realization can only come if science teaching equipment is available in quantity and in relatively good quality. With the emphasis on low-cost science teaching equipment, even the supposedly poor countries will be able to invest profitably in proper science teaching.

Co-operation among and between member countries in the Commonwealth in the bid to popularize low-cost science teaching equipment is vital. The Secretariat lead paper presented at the workshop pointed out that:

'Already the similarity of problems in science education throughout the Commonwealth regions has confirmed the value of co-operation in this field between science educators in this region, in Africa, in the Caribbean and in Asia. The need to reduce wasteful experimentation where relevant experience and systems are already available in member countries and to facilitate inter-regional travel wherever possible, has long been recognized.'

There is need therefore to publicize the outcome of this and similar workshops.

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