

IN-SERVICE TRAINING PROGRAMME FOR CHEMISTRY POST GRADUATE TEACHERS

Learning from Feedback and Evaluation

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ABSTRACT

A 21 days in service training programme for Chemistry Post Graduate Teachers was organized in the Mohindergarh District.. The efficacy of the programme was tested by studying the performance of the participants on the basis of a pre-test and post –test. It was found that performance of the participants increased from 4.85% to 86.90%. The opinion of the teachers on different aspects of the training programme and a feedback were sought through a questionnaire. One of the suggestion was that the types of input in respect of contents; Chemistry theory: Chemistry practical; Education should be 60:10:10 for 80 sessions assigned for the programme.

Key words : In- service training, methodology.

There are different Variables which affect the outcome of the students in the classroom. One of the most important is the effect of the academic behaviour of the teacher (Shymansky and Mathews, 1974; Penick 1976). This, in turn, brings to the fore the need of the teacher training for inculcating appropriate teaching behaviours,

In the pre-service teacher education, adequate emphasis on the content knowledge, integration of methods of teaching with the content and evaluation strategies, is made. However, continuing education of the In-service teachers is necessitated because of gaps and Limitation of pre-service training, continuous changes in curriculum.

Methodology, techniques, innovations and other developments in the education of different subjects as they take place from time to time. In the case of chemistry, a rapid expansion in knowledge and its application in technology is taking place. This advanced content is to be understood and assimilated by the teachers so that they are able to do justice in transaction of the content which calls for periodical in-service programmes. Various agencies and institutions such as colleges of education, DIETs, SCERTs, NCERT. Tribal Welfare Department is involved in the in-service training of the chemistry teachers. Different trends are taking place in chemistry teacher's training programmes. Kornhauser et.al. (1980) have identified four main trends : (i) the move towards the training of teachers to make chemistry more relevant, more accountable and more involved with technology and society : (ii) the move towards making teachers more conversant and enable them to appreciate the potential of new teaching aids and techniques, in particular video equipments and computers: (iii) the move towards the use of variety of assessment techniques, especially those related to continuous assessment of psychomotor and affective skills and (iv) the move towards making teachers more aware of how children learn science subjects and their learning problems in chemistry, as well as, alternative frameworks fro the conceptualization of ideas. Lately, there have been significant changes in the training programme (Allsop and Benson, 1997; DFEE, 2000; Thair and Treagust, 1999). Use of information and communication technologies has also

Increased enormously in the learning of all sciences and technology.

Keeping in view, the current trends in the training programmes, a 21 days in-service training programme for Chemistry Post Graduate Teachers was organized. Different inputs such as practical skills, use of different models and methods of teaching, evaluation techniques through excursion were given. The efficacy of the programme was evaluated by administering a pre-test and a post-test. Opinions of the teachers and feedback were sought through questionnaires.

Process of the Study

Programme Format: The in-service training programme for Chemistry Post Graduate Teachers (PGTs) was organized in the Institute for 21 days. Twenty two participants attended the programme. Each day of the programme was divided into four sessions. Two sessions of the programme on the first day were devoted to registration and inauguration and the last two sessions of the last day were for feedback and report presentation, thus, leaving 80 actual sessions for inputs. Three sessions of one day were assigned for excursion.

Programme Inputs : In all sessions meant for inputs; deliberations on the areas; chemistry content enrichment (giving more emphasis on hand spots and new topics), clarifications related to some practical exercises in laboratory, models and methods of teaching, evaluation techniques, professional competence, teaching aids, learning through

excursions were made. For this task, the faculty of the Institute and some outside resource persons were involved. In one session, analysis of two question papers was made by the participants in workshop mode. Eleven participants analysed one paper and rest 11 another paper.

Evaluation of the Programme: The achievements of the participants were evaluated by holding a pre-test and a post-test. Evaluation of both the tests was made by a team of resource persons. The evaluation analysis of the question papers done by the participants was made by one of the authors. The rating of different inputs on a five point scale; outstanding, very good, good, satisfactory and poor was made by the participants through a questionnaire prepared for the purpose.

Feedback from the participants: A questionnaire to get the feedback on different aspects of the programme was given to the participants. Feedback was sought about the contents of the inputs, the ratio of inputs about abroad content areas: Chemistry (theory and practical) and education, duration of the programme, learning through excursion and facilities.

Learning from the Evaluation and Feedback

The achievements of the participants in the pre-test and the post-test are given in Table 1 and 2 respectively. A perusal of the Tables indicate that the overall average percentage in the pre-test was 49.85 and in the post-test 86.90%. This is a significant improvement in the performance of the participants.

This learning outcome was expected as the participants were receptive and mature. One more reason for high achievement can be due to holding of a post-test immediately after the programme reducing the chances of retention loss due to a passage of time.

The analysis of questionnaire, meant for giving observation on quality of inputs given in class and lab showed that the participants had rated as outstanding the lectures on bonding in coordination compounds, grading system, solid state, digestion, thermodynamics, transition metals, solution chemistry, diagnostic testing and remedial measures and photosynthesis. They rated 'very good' the inputs on guidance and counseling, chemical kinetics, continuous and comprehensive evaluation, biomolecules and isomerism in organic compounds.

Some lectures were rated as 'good' and some 'satisfactory' and none 'poor'. In case of practicals, they opined that chromatography was 'outstanding' and mixture analysis 'very good'.

A perusal of their reporting on the input in class and laboratory indicate that the teachers had appreciated those inputs in which better strategies for teaching were used and new topics were discussed as their learning in those areas had enhanced. Research in developmental and cognitive psychology theories of constructivism supports the idea that information embedded within meaningful contexts (Brooks and Brooks, 1993) and teaching practices that arouse interest, can increase learning (Sandoval 1995).

The opinion of the participants was sought through a questionnaire for the

ratio of inputs in terms of chemistry theory. Practical and education for 80 sessions. The combination for chemistry theory; chemistry practical; education were : (i) 56:8:16, (ii) 50:10:20, (iii) 60:10:10, (iv) 60:15:05, (v) any other. Majority of participants were in favour of chemistry theory - 60, chemistry practical - 10, education - 10. An analysis of the two question papers set by the two groups of teachers (one question paper by 11 teachers and another by rest 11 teachers) was done by one of the authors. The evaluation showed that the participants had acquired mastery in identifying knowledge type question but in one question paper, two test items were reported as application type questions in place of understanding while in the second paper there was a mistake in reporting a knowledge question as understanding and an application as understanding.

The participants also suggested that at least two excursions should be organized for studying the application of chemistry in different fields.

The workshop mode of question paper analysis was favoured by the trainees, UNESCO (1985) also has appreciated the workshop mode of training. It reports that the participants

are active; both mentally and physically. The messages that are conveyed are not transmitted by direct testing but through active involvement. Understanding is achieved by each participant from within rather than from outside: It comes through reflecting on direct experiences and on new ideas which may be presented for discussion.

The feedback also suggests that the duration of in-service programme should be 15 days as the short period maintains the seriousness and retains interest and absorption in the programme.

Conclusion

The in-service training for teachers represents an important area of concern that is no less significant than that of their initial training as knowledge explosion in all disciplines, more so in case of chemistry, is taking place at a fast pace. New learning techniques have entered the field of education. Experts estimate that, at present, the quantity of ideas, information and concepts which a teacher has to assimilate, doubles during his studies and increases eightfold in the course of his working life. Therefore, in-service training programmes should be organized frequently

TABLE -1
Pre-test : Achievements of Chemistry Post Graduate Teachers N=22)

S. No. of the Teacher	Inorganic	Organic	Physical	Total Chemistry	Practical & Education	Total Achievement
	30	30	30	90	10	100
1	12	14	15	41	05	46
2	14	01	14	35	08	43
3	19	21	10	50	05	55
4	22	11	09	42	04	46
5	25	10	12	47	02	49
6	19	10	12	41	06	47
7	23	11	18	52	05	57
8	29	23	13	65	05	70
9	19	04	00	23	03	26
10	22	11	14	47	04	51
11	28	20	15	63	04	67
12	18	13	15	46	06	52
13	25	12	16	53	00	53
14	18	08	11	37	06	43
15	12	09	08	29	02	31
16	22	22	21	65	02	67
17	17	13	14	44	03	47
18	19	15	14	48	05	53
19	26	20	14	60	04	64
20	18	12	09	39	04	43
21	18	0	08	36	01	37
22	Did not Appear					
Average percentage						49.85

TABLE -2
Post-test : Achievements of Chemistry Post Graduate Teachers (N=22)

S. No. of the Teacher	Inorganic	Organic	Physical	Total Chemistry	Practical & Education	Total Achievement
	30	30	30	90	10	100
1	12	01	-	-	-	-
1	23	26	25	74	09	83
2	28	24	24	76	09	85
3	26	29	26	81	07	88
4	26	23	26	75	07	82
5	30	24	25	79	08	87
6	30	26	27	83	08	91
7	30	26	27	83	08	91
8	28	24	26	78	10	88
9	28	24	25	77	09	86
10	26	24	24	74	09	83
11	28	30	27	85	08	93
12	30	27	27	84	10	94
13	29	25	29	83	08	91
14	23	25	28	76	08	84
15	24	25	24	73	08	81
16	27	30	28	85	10	95
17	25	30	28	83	08	91
18	20	27	26	73	08	81
19	30	26	24	80	10	90
20	25	23	26	74	08	82
21	27	24	24	75	08	83
22*	27	24	25	76	10	86
Average percentage	-	-	-	-	-	86.90%

*Did not appear in Pre-test. Therefore, this performance has not been considered.