

## **In-Service Teacher Training Programme: An Analysis of Learner Opinion on the Effectiveness of the Programme**

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### **Abstract**

Feedback obtained from two batches of chemistry teachers who enrolled for Post Graduate Certificate Programme for Professional Development of Teachers (PGCPDT) offered by the Indira Gandhi National Open University (IGNOU) were analyzed in order to assess the quality and determine the effectiveness of the programme. Findings from the survey provide an understanding of the operation of the different components of the programme. Most of the teachers were satisfied with course materials and the Personal Contact Programme (PCP) conducted during the programme. A factor analysis of the collected data is also carried out to identify key issues responsible for determining quality and effectiveness of the programme. Such Open Distance Learning (ODL) based model of teacher training programme has great importance and relevance in countries like India where there is an urgent need of providing training to a large number of teachers at different levels for improve overall teaching standard.

### **Abstrak**

Maklum balas yang diterima daripada dua kumpulan guru kimia yang berdaftar untuk program sijil lepasan ijazah untuk pembangunan profesionalisme guru yang ditawarkan oleh Indira Gandhi National Open University (IGNOU) dianalisis untuk menilai kualiti dan menentukan keberkesanan program. Dapatan daripada kajian memberikan satu kefahaman terhadap operasi komponen-komponen yang berbeza dalam program. Kebanyakan guru berpuas hati dengan bahan kursus dan Program Perhubungan Peribadi yang dikendalikan semasa program. Analisis faktor daripada data yang dipungut juga dijalankan untuk mengenal pasti isu-isu penting yang bertanggungjawab untuk menentukan kualiti dan keberkesanan program. Model berasaskan pendidikan terbuka dan jarak jauh untuk program latihan ini mempunyai kepentingan yang tinggi dan relevan untuk negara seperti India di mana terdapat keperluan yang tinggi dalam menyediakan latihan kepada bilangan guru yang ramai pada peringkat-peringkat yang berbeza untuk mempertingkatkan taraf pengajaran secara keseluruhan.

## **Introduction**

Over the past decades, there has been a noticeable growth in distance education around the world. This is very much evident from the increasing enrolment in Open Distance Learning (ODL) institutions (Cavanaugh, 2005; Fozdar & Kumar, 2006). ODL institutions are not only imparting education as an alternative to the formal system, i.e., education in conventional courses/programmes, but also in areas such as vocational and continuing education, teacher education and even in high technology based education (UNESCO, 2002a; Bourne et al., 2005).

Open distance learning has made major contributions in teacher education. This is the area where distance education has been used extensively to provide pre-service teacher education, upgrading of academic qualification, in-service continuing professional development in subject content areas and instructional methods (Perraton, 2003; UNESCO, 2001; UNESCO, 2002b). In India, through National Policy on Education (NPE) 1986, special efforts have also been made to provide in-service, teacher education for the professional development of teachers at all levels (National Policy on Education, 1986). The National Council for Teacher Education (NCTE) was established with a view to achieve planned and coordinated development of teacher education throughout the country and for regulation and maintenance of norms and standards of teaching. As per the recommendations of the Curriculum Framework for Quality Teaching prepared by NCTE, in-service education of teachers is essential for bridging the gap of pre-service education and for meeting the demands of the changing educational scenario, its context and concerns (NCTE, 1996).

Many organisations like University Grants Commission (UGC), National Council of Educational Research and Training (NCERT), State Councils of Educational Research and Training (SCERTs), District Institutes of Education and Training (DIETs), Academic Staff Colleges of many universities and even few NGOs are working to achieve the objectives laid down for the in-service programmes of teacher education. All these organisations have been conducting in-service teacher education at various levels (national, state, district, blocks school and university levels) using face-to-face model. The face-to-face model followed by these institutions has two main limitations:

- It can accommodate only a limited number of teachers at a time,
- Participants have to leave their locations during the programme which results in loss of teaching time for students and also involves high expenditure.

Both these limitations can be well tackled by ODL system, as this system is more flexible, and can reach a large number of people and is also cost effective. Realising these advantages, NPE recommended that distance mode should also be used for the teacher education and training. IGNOU, in India, has taken a lead in this regard and offered many programmes for school teachers: Diploma in Primary Education (DPE), Certificate in Guidance (CIG), Certificate in Primary Education (CPE), Certificate in Elementary Teaching Education (CETE), Bachelors' Degree Programme in Education (B.Ed.) and for College and University teachers: Post Graduate Diploma in Higher Education (PGDHE) through distance mode. In 2003, on the initiation of Navodaya Vidyalaya Samiti (NVS), IGNOU developed a Post-graduate Certificate in Professional Development of Teachers (PGCPDT) programme to cater to the specific needs of the post-graduate teachers of this organisation. This programme consists of three compulsory courses (MES 001 to 003) on pedagogy, ethics and six optional courses in English, Hindi, Biology, Chemistry, Mathematics and Physics. These courses aim at providing innovative teaching learning methods, content up gradation, personality enrichment, self-development and strategies required for effective transaction of the curriculum. The duration of the programme is six months.

Like other programmes of IGNOU, the programme under investigation also follows a multimedia approach in instruction. It comprises: Self-learning material, supporting audio/video programmes, teleconferencing, counselling sessions, seminar-based and workshop-based activities and added feature of Personal Contact Programme (PCP) to meet specific learner needs. PCPs are conducted at five Training Centres of Navodaya Vidyalayas and Programme Study Centres of IGNOU. Participation of learners in the personal contact programme is 'compulsory' because only successful participation in the PCP determines the eligibility of the learner to appear in the term end examination. Teleconferencing is also used to provide greater clarity and understanding to the learners.

In this paper, through a survey an attempt has been made to assess the overall quality and effectiveness of different components of the Post-graduate Certificate in Professional Development of Teachers (PGCPDT) programme designed and offered for Chemistry teachers of NVS schools. The analysis of survey results would be helpful in improving the overall quality, an enhancing teacher-learning process and also the delivery mechanism, which is very crucial in open and distance settings.

### **Literature Review**

UNESCO had carried out an extensive work to know the effectiveness of ODL system in teacher education. Perraton et al. (2003) have reported ten successful case studies of countries like Brazil, Burkina Faso, Chile, China, India, Mongolia, Nigeria, South Africa (OLSET), South Africa (UNISA) and United Kingdom (UNESCO, 2001). These case studies illustrate the role of different educational technologies like print, audio and video cassettes, audio and video teleconferencing, one-way and two-way television, computer-mediated communication (computer conferencing) and internet in teacher education and role of ODL system in various aspects of teacher education such as (i) improving initial qualification, (ii) continuing professional development, (iii) reorientation of teachers for curriculum reform and change, and (iv) career development. Another UNESCO report has indicated that distance education in its various forms, can work well and if well designed can be educationally legitimate. In fact, the report also indicated that in terms of cost per student, distance education programmes have often shown advantages over conventional programmes (UNESCO, 2002b). Perraton (2003) developed extensive guide for the Commonwealth of Learning (COL), in this guide he reviewed different models of open distance learning used for teacher education and training (Perraton, 2003).

There are many articles published in recent past, which support ODL system as a viable method for providing teacher education. Bof (2004) described the design and implementation structure of 'Proformcao' in service training programme that has been developed to upgrade 27,000 teachers working in Brazil. This programme has proven to be a successful model for the delivery of education at a distance. Jung (2005) has analysed that online teacher training was more cost-effective than face-to-face teacher training.

Furthermore, Bose (2003) reported his experiences with primary school teachers in an e-learning component of training programme. He has found its feasibility to provide the basic course contents, facilitate the development of research skills, empower teachers with basic computer skills, and more significantly, provide them basics of lifelong learning. Fung (2005) has also reported the teachers' views on use of printed materials in a distance learning teacher education course. Fung also reported that despite the heavy emphasis on online learning in recent years, print is still an important medium for course delivery in distance education. Gultekin (2006) and Usun (2003) have described the applications and problems of the distance teacher training programmes in Turkey.

### **Theoretical Framework**

Distance education integrated with new educational technologies can be a powerful means for meeting the challenges of access, quality and costs. However there is a continuous need to assess the quality and effectiveness of the distance education programmes. Course/Programme evaluation is an important tool commonly used by ODL system to assess and improve the quality and effectiveness of the teaching and learning involved (Woodley & Kirkwood, 1988; Woodley, 2004). In most of open distance learning institutions, courses are often evaluated by assessing students reaction or attitudes toward the course content, materials, delivery methods employed as well as by the effectiveness of instructional strategies used for teaching learning process. Several researchers have undertaken the task of developing empirically based attitudinal evaluation instruments for open distance learning system.

In IGNOU, Gaba and Dash (2004) has reported a case study on a course of Post-graduate Diploma in Higher Education. They have taken a feedback from learners on different aspects of the course such as content (language, format, style) academic counselling, extended contact programme, usefulness of audio-video support and delivery system. They have also suggested that these data would be very useful in the programme/course revision. Kaushik and Yadav (2006) have assessed the quality of IGNOU management programme using SERVQUAL model through survey-based research. Sharma (2003) has assessed the quality of the B.Ed. programme

of IGNOU on the basis of the reactions of the learners on various components of this programme.

In a similar study, Prasad (2004), collected feedback form learners for the course evaluation of Certificate Programme in Labour Development (CLD) of IGNOU. In his research study, he has followed theoretical model, Context Input Process Product (CIPP) model proposed by Stufflebeam (Stufflebeam et al., 2000). The CIPP is a comprehensive model to determine and examine the effectiveness of educational programmes. There is another important theoretical four level model for educational evaluation proposed by Kirkpatrick (1996, 1998), which is also commonly employed by distance educators. Cheung (1998) and Biner (1993) developed instruments, which gave valuable insight into usage of student attitude in evaluation of distance education course/programme. Recently, Roberts et al. (2005) have modified Biner (1993) method and identified twenty items for inclusion in instrument. Their four-step process yielded an instrument for evaluation of distance education courses that provides both functionality and flexibility to be used across a variety of courses. Young (2006) has investigated student views of online instruction in higher education courses.

### **Research Questions**

On the basis of the theoretical framework, we have posed the following research questions:

- Could the quality and effectiveness of course material and personal contact programme be analysed by participant's feedback?
- Could one quantify the key issue that determines the quality and effectiveness of a programme?
- Could the key issues identified serve as a tool for improving the overall effectiveness of further programmes?

### **Methodology**

Using literature for the present study, a questionnaire having 41 items was developed. It contained two sets of items (namely Q12 and Q13). Items of these sets are framed to know teachers' perception/attitude towards the programme, in general, and of its various aspects, including the quality

and relevance of course materials, PCP, availability of various programme related resources, learning outcomes, delivery system, learning environment, and use of different teaching strategies. The analysis of these items is based on study of responses which teachers have provided on a 5 point scale from 'Excellent' to 'Poor' for Q12 and 'Strongly Agree' to 'Strongly Disagree' for Q13. Along with these some open-ended questions were also included. The data collected from teachers for Q12 and Q13 were analysed using factor analysis.

The researchers personally administered the questionnaire to 52 Chemistry teachers of the NVS schools during their contact programme in years 2005 and 2006 for two batches. Out of total 84 teachers who enrolled for the PGCPDT programme, only 52 attended the contact programmes. From these 52 teachers, a total 43 completed questionnaires were received.

## **Results**

Data collected for teacher's profile, indicated that 23.3% respondents were female and 76.7% male teachers. Almost 74.4% of teachers were in the age group of 31–35 and 36–40 and all were postgraduate teachers (PGTs). All teachers were having B.Ed and M.Sc. qualification and 14% were also having Ph.D. Degree. Teaching experience of surveyed teachers varied from 2–28 years. Data indicated that 76.7% of the surveyed teachers had already done a course to improve their teaching.

Responses to question how often respondents were using different technology tools such as computer, Internet and other conventional teaching tools were analysed. 58% of the respondents used computer for word processing, presentation and teaching; 37% used e-mail either weekly or monthly but it was striking to find that 23% never used email; 42% used internet but 14% never used internet, 70% used teaching tools such as chart, models etc. This proves that majority of NVS teachers are still teaching through conventional teaching tools.

The Q12 and Q13 have 41 item instruments for determining quality and effectiveness of PGCPDT. Q12 has 25 items and Q13 has 16 items. The items and their means along with percentage frequencies of responses are given in Table 1 and 2. The means for items of Q12 varied from a low of 2.88 to high of 4.22 on a scale of 1 to 5 ranging from poor to excellent in

terms of contributions to the respondents perception about effectiveness of various aspects of programme. 24 out of 25 items of this category have mean scores greater than 3.0, indicating that overall quality and effectiveness of different components of the programme are highly satisfactory. But comparatively low mean scores for items (i) availability of pre-admission information from IGNOU and NVS (2.88), (ii) availability of programme related support after admission (3.05) and (iii) availability of necessary library resources at school (3.05) indicate that respondents are not very satisfied with these aspects of the programme and institution has to take corrective measures in order to further improve the quality of the programme.

**Table 1** Means and percentages of frequencies for the items of Q12

Question Code	Statements	Mean	SD	Poor	Below Average	Average	Above Average	Excellent	Total	Missing
				1	2	3	4	5		
Q121	Convenience of taking admission in the programme	3.93	0.95	2.3	-	32.6	30.2	32.6	97.7	2.3
Q122	Availability of pre-admission information from IGNOU and NVS	2.88	1.14	16.3	11.6	41.9	18.6	7	95.3	4.7
Q123	Timeliness in getting course materials	3.1	1.30	14	14	34.9	14	18.6	95.3	4.7
Q124	Availability of programme related support after admission	3.05	0.97	2.3	23.3	34.9	18.6	7	86	14
Q125	Availability of necessary library resources at your school	3.05	1.23	11.6	18.6	25.6	23.3	11.6	90.7	9.3
Q126	Clarity in course objectives of Chemistry Teaching (MESE-004)	4	0.90	2.3	-	16.3	34.9	23.3	76.7	23.3
Q127	Clarity in course objectives of compulsory courses (MES-001 to 003)	4.06	0.78	-	2.3	14	39.5	23.3	79.1	20.9

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**Table 1** (continued)

Question Code	Statements	Mean	SD	Poor	Below Average	Average	Above Average	Excelent	Total	Missing
				1	2	3	4	5		
Q128	Clarity in overall programme objectives	3.43	1.01	-	16.3	32.6	20.9	16.3	86	14
Q129	Appropriateness of the course content of compulsory courses (MES-001 to 003)	3.94	0.56	-	-	14	53.5	9.3	76.7	23.3
Q1210	Appropriateness of the course content of Chemistry Teaching Course (MESE-004)	4.13	0.71	-	2.3	7	44.2	20.9	74.4	25.6
Q1211	Appropriateness of SAQs and TQs given in course materials	4.16	0.57	-	-	7	48.8	18.6	74.4	25.6
Q12121	Quality of language used in compulsory courses	4.22	0.55	-	-	4.7	48.8	20.9	74.4	25.6
Q12122	Quality of language used in Chemistry course	4.34	0.48	-	-	-	44.2	23.3	67.4	32.6
Q1213	Relation between term end examination and learning activity	3.61	0.75	-	4.7	27.9	37.2	7	76.7	23.3
Q12141	Overall quality of compulsory courses (MES-001 to 003)	4.19	0.54	-	-	4.7	51.2	18.6	74.4	25.6
Q12142	Overall quality of Chemistry Teaching (MESE-04)	4.09	0.84	-	4.7	9.3	37.2	25.6	76.7	23.3
Q1215	Availability of peer group interaction	3.35	1.07	4.7	9.3	30.2	23.3	11.6	79.1	20.9
Q1216	Methodology of the PCP	3.56	0.95	4.7	-	44.2	30.2	16.3	95.3	4.7

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**Table 1** (*continued*)

Question Code	Statements	Mean	SD	Poor	Below Average	Average	Above Average	Excelent	Total	Missing
				1	2	3	4	5		
Q1217	Selection of topics for contact programme	3.77	0.97	-	9.3	20.9	30.2	20.9	81.4	18.6
Q1218	Communication of ideas and information by resource persons	4.08	0.72	-	2.3	11.6	48.8	23.3	86	14
Q1219	Interaction with peer group in contact programme	3.84	0.75	-	-	32.6	37.2	18.6	88.4	11.6
Q1220	Appropriateness of PCP	3.84	0.75	-	-	37.2	41.9	20.9	100	-
Q1221	Extent to which the expectations are fulfilled	3.33	0.84	-	11.6	46.5	23.3	9.3	90.7	9.3
Q1222	Overall rating of PCP	3.51	0.76	-	4.7	44.2	32.6	9.3	90.7	9.3
Q1223	Overall rating of the programme	3.61	0.80	-	4.7	41.9	34.9	14	95.3	4.7

**Note:** The mean was based on a scale ranging from 1 (poor) to 5 (excellent).

For items of Q13, the mean score varied from a low of 3.33 to high of 4.18 on a scale of 1 to 5 ranging from strongly disagree to strongly agree (Table 2). The highest mean scores for ‘the content of compulsory course (MES 001 to 003) was up to date’ and ‘language used to explain concept was simple’ indicate that respondents are highly satisfied with these components of the programme. Further high mean scores for most of the other items indicate that the content of the programme is up to date, language is simple, programme is helping respondents in improving their teaching of chemistry, and various course components are relevant and helping respondents in growing professionally. Thus most of the respondents have gained from this programme. But relative low mean scores for item 6 (3.27) and 7 (3.33), indicate that six months duration is not much comfortable for respondents and proper outflow of information from IGNOU is not available when needed.

The data of open ended questions indicated that 76.7% respondents had already done teacher training programme prior to this programme to improve teaching. 51.2% teachers believed that there should also be some practical component along with the Chemistry Teaching course. The majority of the respondents (76.7%) agreed that good electronic media support is available with the programme. A very good percentage (almost 95%) of teachers stated that they would recommend this programme to fellow colleagues. This indicates the high level of satisfaction of the teachers with the programme.

**Table 2** Means and percentages of frequencies for the items of Q13

Question Code	Statements	Mean	SD	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total	Missing
				1	2	3	4	5		
Q131	The content of the compulsory courses (MES-001 to 003) was up to date	4.18	0.46	-	-	2.3	60.5	16.3	79.1	20.9
Q132	The content of Chemistry Teaching course (MESE 004) was up to date	4.06	0.62	-	2.3	4.7	53.5	14	74.4	25.6
Q133	Language used to explain concepts was simple	4.18	0.46	-	-	2.3	58.1	16.3	76.7	23.3
Q134	This programme helped you in improving your Chemistry teaching	3.95	0.79	-	9.3	2.3	62.8	16.3	90.7	9.3
Q135	Level of difficulty of course materials was appropriate	3.9	0.75	-	7	2.3	53.5	9.3	72.1	27.9

*(Continued on next page)*

**Table 2** (*continued*)

Question Code	Statements	Mean	SD	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total	Missing
				1	2	3	4	5		
Q136	Six months duration for this programme is adequate	3.27	1.07	2.3	25.6	11.6	39.5	7	86	14
Q137	In case of information regarding programme when needed, the IGNOU officials/ faculty responded in a timely manner	3.33	1.04	2.3	14	34.9	18.6	14	83.7	16.3
Q138	During contact programme resource persons had good knowledge of the subject	4.17	0.61	-	2.3	2.3	58.1	20.9	83.7	16.3
Q139	SAQs and TQs were useful for understanding the material	4.16	0.52	-	-	4.7	51.2	16.3	72.1	27.9
Q1310	Objectives and summaries were useful	4.06	0.55	-	-	9.3	55.8	14	79.1	20.9
Q1311	The course contents of the programme were relevant to your professional practice	4.15	0.36	-	-	-	81.4	14	95.3	4.7

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**Table 2** (*continued*)

Question Code	Statements	Mean	SD	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total	Missing
				1	2	3	4	5		
Q1312	This programme will help you in improving your teaching skills at PGT level	3.84	0.86	-	7	18.6	44.2	18.6	88.4	11.6
Q13131	You have gained from studying print materials only	3.87	0.92	-	7	4.7	30.2	11.6	53.5	46.5
Q13132	You have gained from studying both from print and contact programme	4.06	0.68	-	-	14	39.5	18.6	72.1	27.9
Q13133	You have gained from studying contact programme only	3.57	0.93	-	4.7	20.9	14	9.3	48.8	51.2
Q1314	Chemistry Teaching course covers the contents necessary to be taught at 11 <sup>th</sup> and 12 <sup>th</sup> standard	3.81	0.94	-	9.3	18.6	37.2	20.9	86	14

**Note:** The mean was based on a scale ranging from 1 (strongly disagree) to 5 (excellent strongly agree).

### Factor Analysis

We have first carried out a factor analysis and then interpreted the meaning of each factor to comment on the respondent's satisfaction on the aspects of the PGCPDT program. Bartlett's test of sphericity tests whether the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate. So the null hypothesis that the correlation

matrix is an identity matrix is tested and the following results were obtained for Q12 ( $\chi^2 = 303.3$ ,  $df = 300$ ,  $p < 0.436$ ) and Q13 ( $\chi^2 = 69.4$ ,  $df = 120$ ,  $p < 1.00$ ). The p-values found here are insignificant hence we cannot reject the null hypothesis that the inter-correlation matrix comes from a population in which the variables are non-collinear (i.e. an identity matrix). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy tests whether the partial correlations among variables are small. The KMO statistic for Q12 is 0.708 and Q13 is 0.612, that means we can conclude that the degree of common variance among the variables is not very good but tolerable and the factors extracted will account for fare amount of variance but not a substantial amount.

To overcome the identity matrix problem found in the Bartlett's test of sphericity, we deleted some variable from the factor analysis. For Q12, this was done manually by grouping the variables into categories like “availability”, “clarity”, “appropriateness”, quality”, “convenience” and “relevance”. The variables pertaining to “availability” and “convenience” were dropped from the factor analysis for the reason that they are considered to be less important when one talks about the satisfaction level of the respondents for an already existing programme. The results of factor analysis for Q12 with reduced variables are as follows:

Bartlett's test of sphericity

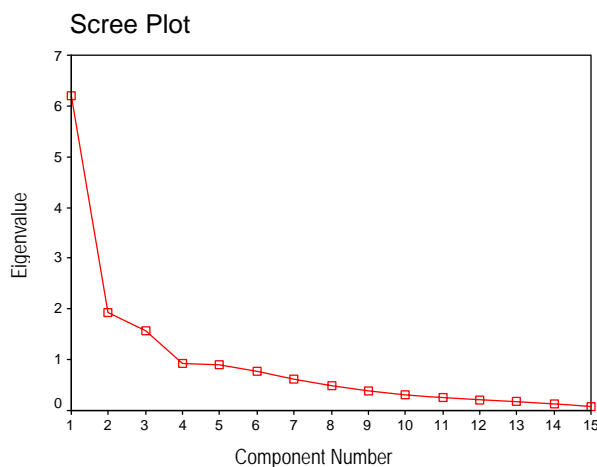
Approx. Chi-Square 161.380,  $df = 105$ ,  $p < 0.000$

The p-value found here is significant hence we can reject the null hypothesis that the inter-correlation matrix comes from a population in which the variables are non-collinear (i.e. an identity matrix). The KMO statistic here is 0.719, that means we can conclude that the degree of common variance among the variables is not very good but tolerable and the factors extracted will account for fare amount of variance but not a substantial amount.

We have also calculated communalities, which is the proportion of the total variance of a variable accounted for by the common factors in a factor analysis. For Q12, all the variables have communality above 0.48 with Q12121 having the highest communality (0.78) and Q1220 having the lowest (0.51).

The following factors were obtained:

Factor I (clarity, appropriateness, quality and relevance for other than Chemistry Teaching) has 12 variables (Q127, Q128, Q1211, Q1220, Q129, Q12121, Q12141, Q12142, Q1216, Q1217, Q1218 and Q1221). Factor II (Clarity and appropriateness for the Chemistry Teaching course) has 2 variables (Q126 and Q1210) and factor III (Quality of language in Chemistry course) has one variable (Q12122). These three factors are explaining almost 65% of the total variance. The following Scree plot has been obtained:



Similarly for Q13, we deleted some variable from the factor analysis. For Q13, this was done manually by grouping the variables into categories like “content”, “language”, “level”, “usefulness”, “duration” and “relevance”. The variables pertaining to “duration” were dropped from the factor analysis for the reason that they are considered to be less important when one talks about the agreement on the aspects of the programme. The result of factor analysis for Q13 with reduced variable is as follows:

*Bartlett's test of sphericity*

Approx. Chi-Square 41.964,  $df = 28$ ,  $p < 0.044$

*KMO and Bartlett's test*

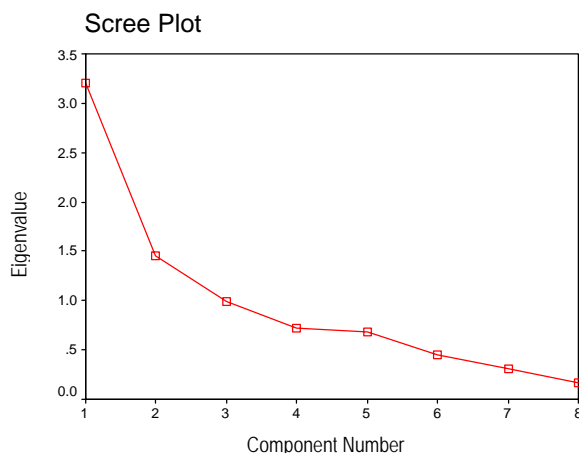
The p-value found here is significant hence we can reject the null hypothesis that the inter-correlation matrix comes from a population in which the variables are non-collinear (i.e. an identity matrix). The KMO

statistic here is 0.708, that means we can conclude that the degree of common variance among the variables is not very good but tolerable and the factors extracted will account for fare amount of variance but not a substantial amount.

Similarly for Q13 also all the communalities were more than 0.47 with Q13131 having the highest communality (0.89) and Q1314 was having the lowest (0.47). This indicates that our variables conform to the requirement of the intended construct.

The following factors were obtained:

Factor I (Content, Language and Level) has 6 variables (Q131, Q132, Q1314, Q133, Q13131 and Q135) and Factor II (usefulness and relevance) has 2 variables (Q134 and Q1311). These two factors are explaining almost 58% of the total variance. The following Scree Plot has been obtained.



### Multiple Regression Analysis

We have computed a factor score for each factor for each respondent and used these factors as the predictor variables in a multiple regression analysis. The result for Q12 is as follows:



Model Summary<sup>b</sup>

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
0.87 <sup>a</sup>	0.75	0.74	0.29	0.75	40.02	3.00	39.00	0.00

a: Predictors: (Constant), REGR factor score 3, REGR factor score 2, REGR factor score.

b: Dependent Variable: PER\_PGCP

ANOVA<sup>b</sup>

	Sum of Squares	df	Mean Square	F	Sig.
Regression	10.31	3.00	3.44	40.02	0.00 <sup>a</sup>
Residual	3.35	39.00	0.09		
Total	13.65	42.00			

a: Predictors: (Constant), REGR factor scores 3, 2, 1

b: Dependent Variable: PER\_PGCP

Coefficients<sup>a</sup>

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error			
(Constant)	3.66	0.04		81.83	0.00
REGR factor score 1	0.31	0.05	0.55	6.28	0.00
REGR factor score 2	0.21	0.05	0.38	4.35	0.00
REGR factor score 3	0.13	0.05	0.22	2.64	0.01

a: Dependent Variable: PER\_PGCP

**Interpretation**

Interpretation of the Regression Analysis with Factor Scores for Q12 is described below.  $R^2$  is the proportion of variation in the dependent

variable explained by the regression model. Here,  $R^2 = 0.75$ , that indicates that the model fit the data well.

Perception about the PGCPDT programme (PER\_PGCP)  
 $PER\_PGCP = 3.66 + 0.31 (FI) + 0.21 (FII) + 0.13 (FIII)$

Where FI, FII and FIII are the factors found for Q12. All the factors were found to be significant predictors. Comparison of the beta weights indicates that Factor I has a greater effect in explaining the respondents perception about the program than Factor II and Factor III. Similarly for Q13 the regression analysis produced the following results.

Model Summary<sup>b</sup>

Change Statistics								
R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
0.81 <sup>a</sup>	0.66	0.64	0.26	0.66	39.02	2.00	40.00	0.00

a: Predictors: (Constant), REGR factor scores 2 REGR factor score 1

b: Dependent Variable: AGREE\_AS

ANOVA<sup>b</sup>

	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.36	2.00	2.68	39.02	0.00 <sup>a</sup>
Residual	2.75	40.00	0.07		
Total	8.10	42.00			

a: Predictors: (Constant), REGR factor score 2, REGR factor score 1

b: Dependent Variable: AGREE\_AS

Coefficients <sup>a</sup>						
		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
(Constant)		3.91	0.04		97.82	0.00
REGR factor score	1	0.25	0.04	0.58	6.22	0.00
REGR factor score	2	0.21	0.04	0.48	5.14	0.00

It came out that clarity, appropriateness, quality and relevance for other than Chemistry Teaching courses forms the core of evaluation indicators for any programme.

Similarly, interpretation of the Regression Analysis with Factor Scores for Q13 is given below.  $R^2 = 0.66$ , indicate that the model fit the data well.

<p>Agreement on the aspects of the PGCPDT programme (AGREE_AS)</p> $AGREE\_AS = 3.91 + 0.25 (FI) + 0.21 (FII)$
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Where FI and FII are the factors found for Q13. All the factors were found to be significant predictors. Comparison of the beta weights indicates that Factor I is having slightly greater effect in explaining the respondents agreement on the aspects of the program than Factor II. Here both the factors are almost equally important this means that agreement of respondents on various aspects of PGCPDT programme is dependent on the content, language, level as well as usefulness and relevance.

## Discussion

We have analysed how the instrument used to evaluate the programme actually performed in terms of the mean scores. Factor I for Q12 comprised of questions pertaining to extent to which the expectations are fulfilled, clarity in overall programme objectives and course objectives for courses (MES-001 to 003), methodology of the PCP, selection of topics for PCP, appropriateness of PCP, SAQs and TQs given in course materials and course content of compulsory courses (MES-001 to 003), communication of ideas and information by resource persons, overall

quality of Chemistry Teaching (MESE-04) and compulsory courses and quality of language used in compulsory courses. All the questions in this factor achieved a mean score in range 3.33 to 4.22. The multiple regression analysis proves that this factor is of prime importance. Factor II comprised of two questions namely clarity in course objectives of Chemistry Teaching and appropriateness of the course content of Chemistry Teaching course. It received mean scores 4.00 and 4.22 respectively. The third factor “quality of language used in Chemistry course” received a mean score of 4.34.

Similarly for Q13, Factor I comprised of coverage of contents necessary to be taught at 11<sup>th</sup> and 12<sup>th</sup> standard, level of difficulty of course materials, gain from studying both from print and contact programme, content of Chemistry Teaching course, updated content for the compulsory courses and language used to explain concepts. These questions received a mean score between 3.81 and 4.18 showing agreement or strong agreement of participants on the aspects of the programme. Factor II comprised of questions on the relevance of contents of the programme to professional practice and whether the programme helped participants in improving the chemistry teaching. These questions received a mean score of 4.15 and 3.95 respectively. This again shows the agreement of participants.

This derives two things, firstly the mean scores on these factors demonstrate that most participants think high about the effectiveness of the program and secondly, some redundant questions can be removed from questionnaires in the future, so as to make it simpler. Also the multiple regression analysis enabled us to model the scores on these factors to predict the effectiveness of the programme. Thus the lessons learnt here would help us in making the questionnaire more effective for further batches.

### **Summary and Conclusion**

The results of the survey carried on the NVS teachers who have gone through the PGCPDT programme, it can be concluded that learners are highly satisfied with the course material and the PCP. But there are few weaknesses such as there is not very good information flow between IGNOU and NVS teachers regarding pre admission and post admission information. Thus, to further improve the quality, institution has to take

note of this problem. Though response rate was very good (83%) but sample size was smaller because of intake for this programme is only 40 to 60 teachers per batch. We carried out this survey for two batches of teachers. We will continue our study for coming batches too. Nevertheless the results definitely helped us in improving the programme and its delivery aspects.

This also provides a framework for devising an instrument for the evaluation of such programmes. As is evident from the analysis that perception of the participants for any teacher training programme depends upon the expectations of participants, clarity and methodology of the PCP, topics and their appropriateness, level of resource persons and quality of subject teaching. This forms the basic building block of success of any programme. Clarity in subject course objectives and the appropriateness of the subject content form the other block. Quality of language is also taken into consideration. We have built a model around these three blocks that can be used as a tool to predict the perception of a participant about the training programme. Similarly, the agreement of participants on various aspects of the training programme depends on content, language and level of the courses and usefulness and relevance of the PCP and the course.

The quality learning outcomes at teaching institution cannot be achieved without effective teaching process and therefore, without quality teacher education. To achieve this there are many other hurdles especially developing countries where there is a need of providing training to large number of teachers and with limited recourses. In such situation similar ODL models could play important and viable role in improving over all teaching-learning process.

## References

- Biner, P.M. (1993). The development of an instrument to measure student attitude toward televised courses. *The American Journal of Distance Education*, 7(1), pp. 62–73.
- Bof, A.M. (2004). Distance learning for teacher training in Brazil. *The International Review of Research in Open and Distance Learning*, 5(1). Available online at: <http://www.irrodl.org/index.php/irrodl/article/view/Article/172/387> (Accessed 1 September 2006).

- Bose, K. (2003). An e-learning experience: A written analysis based on my experience with primary school teachers in our e-learning pilot project. *The International Review of Research in Open and Distance Learning*, 4(2). Available online at: <http://www.irrodl.org/index.php/irrodl/article/view/151/232> (Accessed 1 September 2006).
- Bourne, J., Harris, D. & Mayadas, F. (2005). Online engineering education: Learning anywhere anytime. *Journal of Asynchronous Learning Networks*, 9(1). Available online at: [www.sloanc.org/publications/jaln/u9n1/v9n1\\_bourne.asp](http://www.sloanc.org/publications/jaln/u9n1/v9n1_bourne.asp) (Accessed 1 September 2006).
- Cavanaugh, J.K. (2005). Are online courses cannibalizing students from existing course? *Journal of Asynchronous Learning Network*, 9(3). Available online at: [http://www.sloan-c.org/publications/jaln/v9n3/v9n3\\_cavanaugh.asp](http://www.sloan-c.org/publications/jaln/v9n3/v9n3_cavanaugh.asp) (Accessed 1 September 2006).
- Cheung, D. (1998). Developing a student evaluation instrument for distance teaching. *Distance Education*, 19(1), pp. 23–42.
- Fozdar, B.I. & Kumar, L.S. (2006). Teaching chemistry at Indira Gandhi National Open University. *Turkish Online Journal of Distance Education (TOJDE)*, 7(2), pp. 80–89.
- Fung, Y.Y.H (2005). Teachers' views on and use of printed materials in a distance learning teacher education course. *Open Learning*, 20(2), pp. 175–183.
- Gaba, A.K. & Dash, N.K. (2004). Course evaluation in open and distance learning: A case study from Indira Gandhi National Open University, *Open Learning*, 19(2), pp. 213–221.
- Gultekin, M. (2006). The attitudes of pre school teacher candidates studying through distance education approach towards teaching profession and their perception levels of teaching competency. *Turkish Online Journal of Distance Education*, 7(3), pp. 184–197.
- Jung I. (2005). Cost-effectiveness of online teaching training. *Open Learning*, 20(2), pp. 131–146.
- Kaushik, M. & Yadav, K. (2006). Assessing service quality of IGNOU management programme. *Indian Journal of Open Learning*, 15(2), pp. 141–154.
- Kirkpatrick, D.L. (1998). *Evaluating Training Programmes: The Four Levels*, 2<sup>nd</sup> ed. San Francisco: Berrett-Koehler.
- Kirkpatrick, D.L. (1996). Techniques for evaluating programmes. *Part of Great Ideas Revised Series in Training and Development*, Jan. pp. 54–59.
- NCTE (1996). *Quality Teacher Education - A curriculum framework*. New Delhi: NCTE. Available online at: <http://www.ncte-in.org/pub/curr/curr.htm> (Accessed 1 September 2006).
- National Policy on Education (1986). *National Policy on Education, 1986*. New Delhi UGC. Available online at: [http://www.ugc.ac.in/policy/npe\\_86.html](http://www.ugc.ac.in/policy/npe_86.html) (Accessed 1 September 2006).
- Perraton, H. (2003). *Models for Open and Distance Learning I: Teacher Education and Training*. International Research Foundation for Open Learning and The Commonwealth of Learning.

- Prasad, N. (2004). Programme evaluation under open learning system: An evaluation of CLD programme of IGNOU. *Indian Journal of Open Learning*, 13(3), pp. 313–346.
- Roberts, T.G., Irani, T.A., Tely, T.W. & Lundy, L.K. (2005). The development of an instrument to evaluate distance education course using student attitudes. *The American Journal of Distance Education*, 19(1), pp. 51–64.
- Sharma, D.P. (2003). Teacher Education programme of IGNOU: Student, teacher's perception. *Indian Journal of Open Learning*, 11(3), pp. 335–346.
- Stufflebeam, D.L., Madaus, G.F. & Kellaghan, T. (2000). *Evaluation Models* (revised). Boston: Kluwer.
- UNESCO (2001). *Teacher Education Through Distance Learning Technology-Curriculum Evaluation Cost*. Paris: UNESCO.
- UNESCO (2002a). *Open and Distance Learning: Trends Policy and Strategy Consideration*. Paris: UNESCO. Available online at: <http://unesdoc.unesco.org/images/0012/001284/128463e.pdf> (Accessed 1 September 2006).
- UNESCO (2002b). *Teacher Education Guidelines: Using Open and Distance Learning*, Paris: UNESCO.
- Usun, S. (2003). The applications and problems on the distance teaching training in Turkey. *Turkish Online Journal of Distance Education (TOJDE)*, 4(4). Available online at: <http://toJde.anadolu.edu.tr/tojde12/articles/usun3.htm> (Accessed 1 September 2006).
- Woodely, A. (2004). *Commonwealth of Learning PREST: Modules A1: Doing educational research and evaluation in ODL*, Commonwealth of Learning. Available online at: <http://www.col.org/colwels/webdav/site/myjabiasite/shared/docs/A1/pdf> (Accessed 1 September 2006).
- Woodley, A. & Kirkwood, A. (1988). Evaluation in distance learning. In J. Jenkins (Ed.), *Commonwealth Cooperation in Open Learning: Background Papers*. London: Commonwealth Secretariat, pp. 291–298.
- Young, S. (2006). Student views of effective online teaching in higher education. *The American Journal of Distance Education*, 20(2), pp. 65–77.