

Decisive Evaluation in Distance Education: A Case Study of the Certificate in Computing at IGNOU, India

Naveen Kumar

School of Computer and Information Sciences
Indira Gandhi National Open University
Maidangarhi, New Delhi 110068, India
naveenkumar@ignou.ac.in, naveenkr_singh@rediffmail.com

Abstract

Evaluation of a course or a programme not only demonstrates its strengths, but also points out its inherent shortcomings. This is why programme evaluation constitutes an important function in an open and distance learning system. This paper presents the results of an evaluation of a computer science programme taught in distance learning mode by the Indira Gandhi National Open University (IGNOU), India. This six-month programme for the Certificate in Computing (CIC) was launched in 1994. The courses intend to give basic awareness and skill about computers. Feedback was obtained from the students currently pursuing the programme, from those who had successfully completed the programme and from the counsellors and experts teaching the courses. The evaluation presented here is focussed on two aspects of the programme; one the administration of distance education and another course content. The data was gathered through feedback questionnaires sent to identify study centres and through face-to-face interviews of the CIC students. The survey findings were coded and analyzed using MS-Excel. This paper also looks at the students' perception of the content, value and quality of the course, and the effectiveness of counselling and practical methods. Our study will be useful to the researchers and practitioners in the field of computer literacy and awareness programmes through distance and open learning environment.

Abstrak

Penilaian sesuatu kursus atau program bukan sahaja menjelaskan kekuatannya tetapi juga menunjukkan kelemahan dalaman. Atas alasan tersebut penilaian merupakan fungsi yang penting di dalam sistem pembelajaran terbuka dan jarak jauh. Kertas kerja ini mengemukakan keputusan satu kajian program sains komputer yang diajar dalam mod pendidikan jarak jauh di Indira Gandhi National Open University (IGNOU), India. Program enam bulan

ini untuk sijil dalam pengkomputeran dilancarkan pada tahun 1994. Kursus ini bertujuan untuk memberikan kesedaran asas dan kemahiran terhadap komputer. Maklum balas telah diterima daripada pelajar yang sedang mengikuti program, pelajar yang telah berjaya mengikuti program, kaunselor dan pakar yang mengajar kursus ini. Penilaian yang dibentangkan di sini memfokuskan kepada dua aspek program: pertama ialah pentadbiran pendidikan jarak jauh dan kedua kandungan kursus. Data dikumpul melalui maklum balas soal selidik yang dihantar ke Pusat Pembelajaran yang telah dikenal pasti dan juga melalui temuduga bersemuka. Dapatan kajian dianalisis menggunakan MS-Excel. Kertas kerja ini juga melihat kepada persepsi pelajar terhadap kandungan, nilai dan kualiti kursus dan juga keberkesanan kaunseling dan kaedah yang dipraktikkan. Kajian ini berguna kepada penyelidik dan pengamal dalam bidang kemahiran komputer dan program serta kesedaran melalui persekitaran pembelajaran jarak jauh dan terbuka.

Introduction

The Certificate in Computing (CIC) is a 16-credit programme, one credit being equivalent to thirty hours of student study time. This programme consists of four courses worth four credits each, as given in Table 1. The first course “the Context” gives an introduction to information age and computing to the learner, next course technology gives details about technology and tools available, next course gives details of application of these technologies and finally the fourth course gives the practical and hand on experience to the learner (see Table 1).

Table 1 Course Code and Course Title

Course code	Course title
CIC – 01	The Context
CIC – 02	The Technology
CIC – 04	The Applications
*CIC – 05	MS-OFFICE

*CIC – 05 was offered in 1998 instead of CIC – 03, “The Tools”.

The CIC was launched in 1994 with the aim of giving basic knowledge about computers to any one with minimum of twelve years of schooling. It is a short duration (six months minimum and two years maximum) programme available in English and Hindi. This programme is used as a tool to assess the learner's potential for taking up further computer science education through the distance mode. It is also being used for providing a background to those persons seeking admission to the Masters of Computer Applications (MCA) and Bachelors of Computer Applications (BCA) of IGNOU who have not studied basic programming at the previous qualifying level. Since this programme was launched, computer technology, and access to basic computers, has changed a great deal. Therefore, a strong need was felt for reviewing this programme. As part of this process, a feedback study was undertaken. Feedback on the utility and content of the material was obtained through questionnaires (see Appendixes A, B and C) sent to current batch students, students who had completed the programme and counsellors, respectively. Other sources of feedback (anecdotal, from incidental meetings with students, or from colleagues in the conventional system) have also been taken into account.

In past, similar studies were conducted by Johannes (1989) who had evaluated a two-year programme for the Certificate in Adult Education. Ashok and Nirod (2004) had evaluated a course to find the administrative issues in the course delivery, support services and management. Christine (1996), describes the results of an assessment of student attitudes in five areas (instruction, technical aspects, course management, membership, and course satisfaction) based on their experiences in an interactive television class. However there are limited studies on evaluation of computer science programmes, which can help to improve management and support functions and detailed understanding about the topics to be included in the computer literacy and awareness programmes. Our study will be useful to the researchers and practitioners in the field of computer literacy and awareness programmes through distance and open learning environment.

Instructional System of CIC

The instructional system of the programme, like other programmes in IGNOU, follows a multimedia approach. This primarily consists of self-

instructional printed material, supported by audio/video cassettes and CDs, audio/video programmes transmitted through radio and TV broadcasts, face-to-face counselling at study centres by academic counsellors, a reference library at each study centre, web-based academic support, practicals at designated tele-learning centres, teleconferencing. The printed material consists of blocks, each block further divided into 4 or 5 units. The units are in a structured self-instructional format with introduction, objectives, course content divided into small sections, ‘check your progress’ exercises and further reading references.

The students are provided with the facility of a total of 16 face-to-face theory-counselling sessions (2 hours per session) and 16 practical sessions (2 and half hours each) on weekends. One counselling session is mapped to approximately one block of the course, during which students discuss their problems/doubts regarding the block with the counsellor. The main practical components of CIC are “Windows” and “Microsoft Office” covered in CIC-05. Practical sessions are held at computer centres, which may or may not be co-located with the study centres. At these computer centres, the student has the facility to use the computer and software packages relevant to the syllabus for solving exercises and problems given in the course materials and in counselling sessions. During the practical sessions, each student is expected to work through the required exercises on her own. Approximately 40 hours of computer time has been allotted per student for the entire CIC programme. For successful completion of the programme, a student is advised to have a minimum of 75% attendance in the practical sessions.

Delivery and Evaluation System

The course material is delivered to students through a variety of means. The Starter Kit (i.e., details about the programme and a sample exam question paper), printed materials and schedules for counselling, radio and TV broadcasts/teleconferencing are delivered by post. (The starter kit and old question papers are also available on the IGNOU website). Audio and video programmes, library and computer lab facilities and counselling services are provided to the students at the study centres.

Originally, the evaluation of students had a 30% weightage for continuous assessment (through assignments), and a 70% weightage for the term-end examination. However, from July 2002, onwards, the University decided to do away with continuous assessment due to infrastructural reasons. Thus, the evaluation for each course in CIC is only through a term-end examination, with a weightage of 100%. This examination consists of objective type multiple-choice questions, and is assessed by a computer. The passing marks are 50% for each course. Passing all the courses is mandatory for award of the CIC. The exams are held in June and December every year.

Need and Objectives of Feedback Study

This feedback is planned to study the association between course design and dialog in distance education courses in order to test. Moore's (1972) theory of transactional distance is one of the key works in existing debates about distance education. His perception of distance, is not as physical space or geography, but as the space of probable misunderstandings among the intent of the teacher and those of learners, is necessary to any study of distance education. To develop the quality and effectiveness of the teaching and learning, there are a range of measures that can be adopted to notify the activities of those concerned in providing and supporting instruction.

In distance education the partition between teachers and students normally involves instruction or learning experiences being mediated through recorded materials. These materials will usually remain in considerably the same form for several associates of learners, although various modifications and revisions can usually be arranged. In turn, this separation entails the non-existence of direct verbal and non-verbal feedback from students that is so significant in all teaching.

The evaluation of any distance education teaching materials or course of instruction may seek to provide information that can be used during the process of developing or preparing materials or learning experiences – formative evaluation procedures, or information about how well the finished instruction has worked in normal use-summative evaluation procedures. It is not important here that how well distance teaching

materials have been prepared, it is not until students study and try to study from them that it is probable to determine how good an educational experience results. It is all too simple to believe the product of course development in distance education to be the materials that are distributed to students by one means or another, whereas it is really the interaction of learners with those materials and other resources, possibly including tutors and fellow students (Woodley et al., 1988).

As the field of computer science has evolved rapidly in the past few years, and with the escalation of awareness of Information and Communication Technologies (ICT) and the increase in expertise amongst the population in general (Adams, 2004). Thus, the courses in this CIC programme required a detailed re-look. Towards this end, a formal extensive evaluation of programme was undertaken by obtaining feedback through questionnaires from a sample of present and past students, counsellors, and peers in institutions offering similar programmes. This research was designed to evaluate the experiences of these groups and to consider whether the programme was achieving its aims. More broadly the study is concerned with whether computer learning is a useful and valid experience in adult education in general. The main questions we have examined are:

- Why do students opt for the CIC programme?
- How do students of the CIC react to various aspects of the self-instructional material?
- How do they perceive the quality of the theory and practical counselling sessions?
- What suggestions do they have for improving the theory and practical counselling?
- What audio/video support and reference books/material support would they like?
- How useful do they find the support services and facilities provided by IGNOU via the study centres?
- Once they finish the programme, how is it helpful or useful to them?
- What are their suggestions for improving the course material, and the system of evaluation methodology?
- How does this compare with other programme with similar objectives?

Feedback Procedures

The course evaluation is a very significant phase for course development. Lack of continuous or systematic evaluation of a course causes its stagnation and as a consequence its degradation (McKeachie, 2006). The goal of this decisive evaluation is to improve the course content, adjusting it to the current and future requirements. Evaluation as a phase detecting weak points of a course, allows for articulating of directions of its changes (Owoc et al., 2000). As technological modernisations change the environment of distance education, educators require assessing the attitudes and opinions of students participating in the new learning environments. Biner et al. (1994) suggest that distance education evaluation efforts should start with the evaluation of student attitudes and opinions preceding evaluation of learning outcomes, claiming that the study of learner satisfaction is a main decisive factor by which to judge the effectiveness and success of distance programs. The more optimistic the attitude, the more likely participants are to pay attention and to learn.

This is a case study; however, it takes elements from other methodologies that help to inform the process. Case study is defined here as ‘decisive evaluation’ over time through detailed, in-depth data collection involving multiple sources of information rich in context (Cresswell, 1998). The formal feedback framework and methodology was designed based on the previous studies of Lien (1967), Neil (1981), Taylor (1978), Weiss (1972) and Williams (1973). We have obtained the responses through the following modes:

1. Through questionnaires sent to:
 - (a) 100 students per region in 30 regions, enrolled in the July, 2004 session through the study centres concerned. The regional centres (RCs) were requested to pick 5 SCs in their region, varying in range from urban to rural, preferably two from urban, two from rural and one from a semi-urban area.
 - (b) 5 CIC counsellors per region through the SCs concerned. The RCs were requested as in (a) above.
 - (c) Around 3600 students who enrolled in CIC in 2001 and 2002, through post and e-mail.

- (d) 50 students enrolled in the July 2004 session, and two counsellors per region attached to five recognised regional centres including Army, Navy and Air force.
2. A few face-to-face interviews by faculty with students at RCs and at headquarters.

Responses and Findings

We received approximately 200 responses from different students and counsellors. All these responses have been categorised, filtered, analysed and compiled. The results are presented in the next three sub-sections under the categories ‘current students’, ‘students who have completed the programme’ and ‘counsellors’, respectively. The responses collected by a variety of means, a wide range of evaluative comments and information collected from students, tutors and, possibly, other interested parties. Each of the various methods illustrated above has its strengths and weaknesses and for any particular course one or more of the procedures may be taken to be most appropriate. For example, the questionnaire survey of current students may offer a suggestion of significant problem areas and guide to some follow-up interviews being undertaken with counsellors and students in order to decide the nature of the problems and to bring out suggestions about how they can be conquered. However, before any procedures are initiated, it is important to set up the extent to which it is possible to make changes to the teaching in the light of any evaluation. To a large degree, this means considering what information can be acted upon, and when it should be collected.

Responses from Present Students

Question 1:

How many counselling and practical sessions in CIC have you attended?

Students response:

The percentage of theory sessions attended by the students those were enrolled in the July 2004 session is shown in Figure 1. We observed that roughly 27% of the students did not have the required minimum attendance of 75% of the practical sessions for appearing in the

examination but had given the exam. This indicates that there is no proper monitoring mechanism in place regarding this.

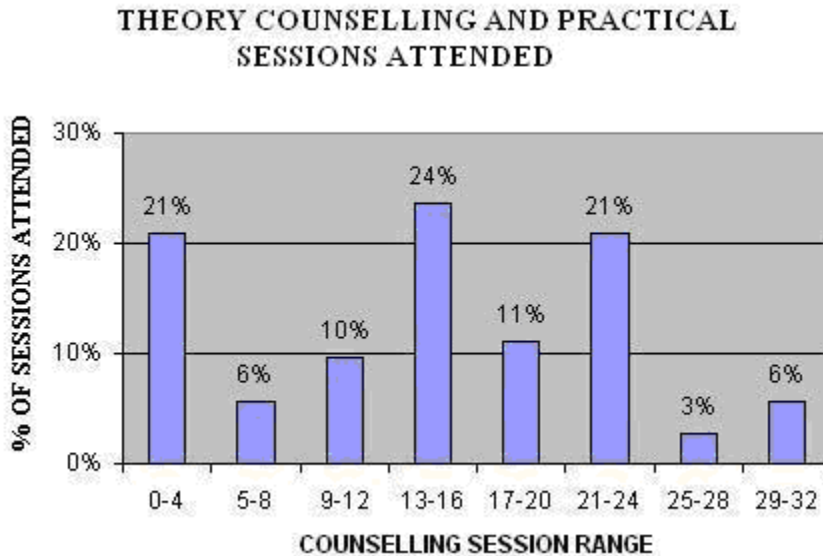


Figure 1 Percentage of Sessions Attended by Current Students

Question 2:

Why have you opted for CIC?

Students response:

The students' responses specifying their reasons for joining the CIC programme are categorised into five domains as shown in Figure 2. We observed that 72% of our students are joining the CIC programme for pursuing MCA (52%) and BCA (20%) (as it is a compulsory eligibility criterion for students without a basic programming background), also we found that around one fourth (23%) of the students in the current batch have joined our programme to acquire a basic knowledge of computers, improving the job prospects and practice on Windows and MS-Office, which are the main objectives of the programme.

REASONS FOR OPTING FOR CIC

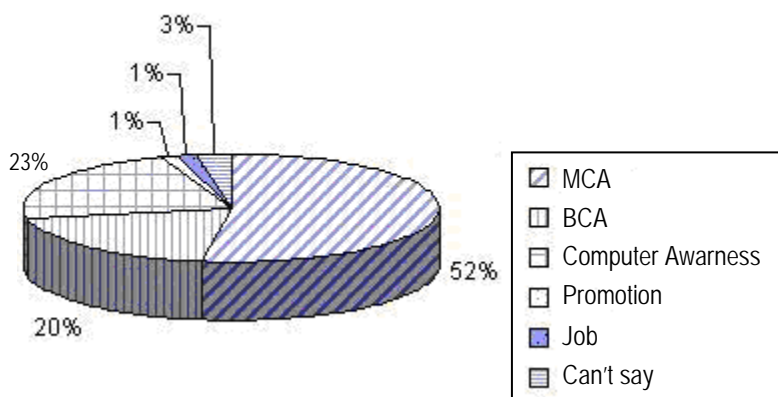


Figure 2 Responses in Percentage Showing Reasons for Joining CIC

Question 3:

Do you find the counselling sessions helpful in understanding the CIC courses?

Mark any one of the following:

Excellent, Good, Satisfactory (refer to Average), Unsatisfactory.

Students response:

In response (as shown in Figure 3) we found that only one percent of the students are not satisfactory and found that the theory counselling is not useful or helpful to them in understanding the CIC courses. Also, during crosschecking with responses to Question 1, we observed that the students, who attended more than 10 counselling sessions, were satisfied with the counselling sessions.

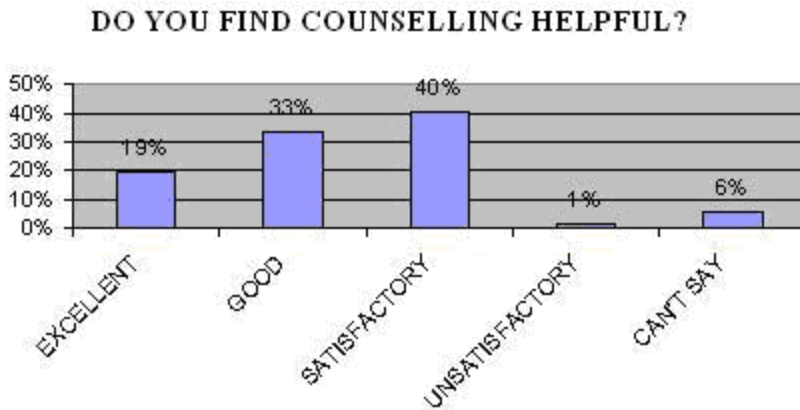


Figure 3 Students' Satisfaction in the Theory Counselling

Question 3.1:

If satisfactory, in what way?

Students response:

- Good quality of counsellors (18% students found this the main reason of their satisfaction)
- Good guidance and helpful attitude of counsellors (14%)
- Good notes and explanatory counselling sessions (16%)
- Counselling session provided basic knowledge of computer science/IT (7%)
- Did not respond (42%)

Question 3.2:

If unsatisfactory, please give your suggestions for improvements.

Students response:

46% students gave their suggestions, as below:

- Increase the number of counselling sessions, and session time (51%)
- Give theory counselling in computer labs (12%)
- Provide good counsellors (37%)

Question 4:

Do you find the practical sessions helpful in understanding CIC-05?

Mark any one of the following:

Excellent, Good, Satisfactory (refer to Average), Unsatisfactory.

Students response:

In response (Figure 4) we found that 19% of the students are not satisfactory and found that the practical counselling is not useful or helpful to them in understanding the CIC courses. During further analysing the data, we observed that 25% of students who attended more than 10 practical counselling sessions, were not satisfied with them, hence the suggestions given by the unsatisfactory students becomes very important to us. The main reasons for their unsatisfaction are low hardware configuration of computers, outdated practical course based on Windows 95 and MS-Office 97 and no evaluation of practical work in the practical counselling.

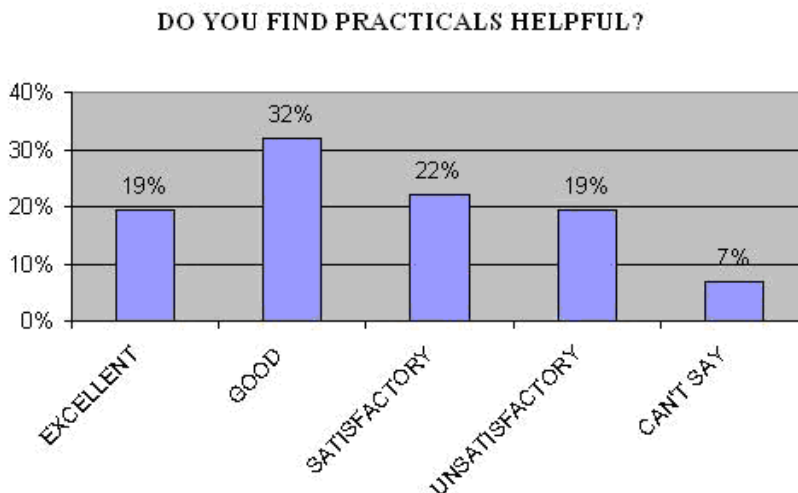


Figure 4 Students Satisfaction in the Practical Counselling

Question 4.1:

If satisfactory, in what way?

Students response:

- Learned the computers skills and proficiency in MS-Office package (12%)
- Good guidance of teachers (2%)
- 60% did not respond to this question
- Other students did not give a relevant answer

Question 4.2:

If unsatisfactory please give your suggestions.

Students response:

32% students gave their suggestions, as below:

- Improve the hardware configuration of computers in the labs (21%)
- Increase the number of practical sessions (23%)
- A good counsellor may be provided (12%)
- Update practical course material (19%)
- Introduce project work (9%)
- Take regular feedback (7%)
- Introduce practicals for improving hardware knowledge (9%)

Question 5:

If you referred to the reference books listed in the course, where did you get them?

Students response:

- From friends (18%)
- Library (6%)
- Purchased oneself (6%)
- Study centre (36%)
- Website (6%)
- Left unanswered (22%)
- Other 6% of the students did not give a relevant answer

Question 5.1:

Who else have you taken help from for studying the course?

Students response:

This response of old students gives an idea about the support, which may be required by the students while studying the “self instructional material”.

- IGNOU Teachers/Coordinator (7%)
- Other books/Library/Question papers (26%)
- Friend /Family members (11%)
- IGNOU website/Online course materials of different courses (16%)
- Internet as general (apart from point above) (14%)
- No other source (26%)

Question 6:

What support from IGNOU was lacking for studying this course?

Students response:

56% of the students responded to this question. Their responses are grouped into five categories as given below:

- Question bank, guidance on how to prepare for examination, easy books, more books on objective questions and more reference book list (18%).
- Internet facilities, new upgraded computer and enough number of computers in lab should be provided in SCs (28%).
- More theory and practical sessions, more interaction in counselling sessions, introduce group discussion in the counselling, integrate theory and practical counselling sessions, and improve counselling quality (24%).
- Send material timely, timely information of important activities, counselling, programmes, proper information to students (17%).
- Update course timely, add more programming languages in the courses and decrease theory components in the courses (13%).

Responses from Past Students

IGNOU had selected 28 Regional Centres at the time of study. From each region 20 to 50 students of the CIC programme who had completed the

programme were selected and the feedback forms are sent to them. We could only obtain the email address of 3600 of the past students, the feedback forms are sent to all of them by email. However, we received very few responses through this mode. A total of 61 responses were recorded by different modes. The feedback of the old students is very important for finding out how helpful or useful the programme was to them in their day-to-day life. It is also helpful in obtaining their suggestions for improving the course material, and the system.

Question 1:

How were CIC courses (The Context, The Technology, The Application and MS-Office) useful to you?

Students response:

According to students the first course of the programme (The Context) helped them in learning/understanding the computer science fundamentals, and it gave them an idea of computer methodologies and the importance of information society. The next course 'The Technology' was useful for them in understanding the software and hardware technology working behind the computer systems and Internet. Further the course 'The Application' was useful for them in understanding the applications of software and hardware technology available to them and it is also helpful in their day-to-day life with improved understanding computer solutions. The last course of the programme 'MS-Office', which is completely a practical course provided them the essential computer skills, which helped them during their job work and further studies. As general students have responded that this particular course helped them in understanding the Windows and MS-Office software packages and it was really usefulness in their real life. We found that the most of our courses were useful to the students and fulfilled their objectives, however the first course of the programme *The Context* may not be much relevant in the current IT scenario. Our study shows that the programme structure adopted in the CIC is appropriate for designing the computer awareness programmes, as it covers the gradual increment of computer fundamentals to computer applications.

Question 2:

What other topics need to be included in theory courses?

Students response:

Topics to be included in theory courses:

Students have expressed different topics and areas to be covered in the theoretical courses as given below:

- Use of computer in education and awareness of Internet, ethics rules etc.
- The basic knowledge of programming languages.
- Artificial intelligence, basic electronics and mathematics, algorithms design.
- Marketing technologies and business outsourcing processing.
- More details on multimedia hardware/software, MS-Office package, operating systems (alternate to windows), Web designing, TCP/IP Protocols, hardware internals/configuration and searching techniques and e-mailing.

Question 3:

What other topics need to be included in practical courses?

Students response:

Topics to be included in practical courses:

Students have expressed different topics and areas to be covered in the practical courses as given below:

- Students are interested to include the programming language like C/C++.
- They are also interested in advanced and alternative operating system like Window XP and Linux.
- Students showed their great interest in HTML programming, animation softwares like Flash, Corel Draw, web designing softwares like Dreamweaver, Internet searching and advance search engines.
- Also, students want to include the topic on assembling and configuring a computer system, trouble shooting of hardwares and softwares.

General Suggestions from Past Students

During our feedback study we also gathered some general suggestion from old students for improving the CIC programme. Some of these are as follows:

- Add more objective type questions in the check in progress of the courses because question papers are objectives type questions.
- Course contents need regular review.
- Increase number of lectures on the television/radio broadcast.
- Windows and MS-Office are very important components in CIC so that maximum numbers of practical sessions are to be added for these components.
- Improve the student's interaction; introduce group discussions in counselling to make it more interesting.
- Increase counselling sessions duration and start counselling sessions in the mid-week also.
- Send the course material to the students in right time.
- The computer labs for students should be well furnished and have latest computer machines and best Internet facilities.
- Add project work in the programme.
- Only good counsellors should be employed for CIC, those who have deep knowledge of the course, and relevant experiences.
- Attendance should be made above than 75%.

The general suggestions given by the old students are highly important in understanding the problems that might be faced by the students during their courses; they have mentioned that the course materials should be delivered on time, which shows that some improvements are needed in delivery mechanisms; students have expressed that the computer labs should have latest computer machines and best Internet facilities which imply that the study centre monitoring should be improved, similarly some other domains need improvements in area like course review mechanism, counselling sessions and student's interaction during the counselling sessions through group discussions and project work.

Responses from Counsellors

We received 16 responses from counsellors of different Study Centres countrywide. It was important for us to know the problems faced by counsellors in undertaking the CIC counselling. As they teach students in the face-to-face mode, their feedback would help us to know the ground level situation and requirements.

Question 1:

What other topics need to be included in the programme?

Response:

- Basics of website designing and Internet searching.
- Latest computer and networks systems (software and networking devices).
- Computer security and computer crime.
- Office automation.
- Introduction to C programming, SQL/ORACLE.

We found that the new topics to be included in the courses are similar as expressed by the old batch students. For example, both have mentioned to include the programming languages and website designing, hence these topics are highly relevant to the computer awareness courses in the current scenario.

Question 2:

How does this programme compare with similar programmes taught in your college/university/institute?

Response:

- Similar programme period is generally of longer duration up to one year.
- With objective and descriptive type exams, practical examination is important component of similar programme.
- Assignment and project work are compulsory for each course.
- We offer diploma in computer engineering of duration one year, we cover each topic and subjects in depth.

- We divide practicals into different sessions normally in the form of assignment, projects and feedback. (Each session is of two hours with one hour assignment and one hour feedback session).

Suggestions for Improving our Course Material

- Many topics have been repeated like in networking the types of channels for communication. Also in different types of operating systems, no examples have been given.
- Presentation may be improved with adding more graphics in the course materials.
- In the courses, some topics are explained in short, more examples should be included.
- Include latest operating system and office package. Also, latest courses must be added.

Suggestions for Improving the Practical Session

- Change the practical session to latest operating system and office package version.
- Make guidelines for practical sessions for the students and counsellors.
- Number of practical sessions and their duration must be increased by one hour.
- Add project work for each practical course.

Suggestions for Improving Evaluation Scheme and Delivery System

- There should be practical exams conducted for CIC students. The term-end theory or written exams should not be just objective. They should have descriptive question too.
- Project based and descriptive assignments should be given to the students.
- Increase the course duration and give more practical sessions.
- Divide the programme in more semesters (increase the programme duration).
- Course material can be sent by e-mail.

We found that the assignment and project work is lacking in the programme as responded by students and counsellors both however these have high relevance in learning the computer courses. Also students and counsellors have expressed that the course duration should be increased and more practical sessions should be given.

Conclusion

This feedback report is the outcome of a research study of reactions of present learners, students who have completed the programme and counsellors to the CIC programme courses. This programme evaluation is also applicable for revision of similar computer science programme offered by other distance education universities. Based on the results of this study, recommendations for improving the administration and content of these and other similar programme included the following points.

To fulfill the basic objective of computer literacy and awareness, some initiative must be taken by the university as we have shown in our study that only 23% students have joined the programme to acquire a basic knowledge of computers. Improve emphasis on support management functions, increased attention to the level of interactivity in the distance classroom, training for instructors, and an orientation for students.

Institutions need to pay more attention to course management and support functions. Actions include improving Johannes (1989) dispatch and distribution of course materials, Gaba et al. (2004) distribution of information about programme and online sessions, Christine (1996) website facilitation, Moore (1972) access to resources such as library materials for students. Woodley et al. (1988) supply of extra reading materials to students, particularly for theoretical subjects. Adams (2004) university must ensure best technical quality possible in SCs and RCs. McKeachie (2006) improve the hardware configuration of computers, Internet facility in the computer laboratories.

Some suggestions given for improving quality of counselling should be included. Using different example and questions during counselling sessions, Gaba et al. (2004) increase the number of counselling sessions, and session time, Christine (1996) give theory counselling in computer

labs. Moore (1972) some measure for improving the counselling attendance is necessary; problem in implementing the attendance validation may be identified in the research.

Acknowledgements

I would like to record my gratitude to Prof. Parvin Sinclair for taking the initiative, giving motivation and suggestions to undertaking this feedback study and preparing the report and Mr. Ashok Sharma for his help in data recording and analysis. I would like to sincerely thank the faculty and staff of the School of Computer and Information Science for their help, constructive criticism and suggestions.

References

- Adams, A.M. (2004). Pedagogical underpinnings of computer-based learning. *Journal of Advanced Nursing*, pp. 5–12.
- Biner, P.M., Dean, R.S. & Mellinger, A.E. (1994). Factors underlying distance learner satisfaction with televised college-level courses. *The American Journal of Distance Education*, 8(1), pp. 60–71.
- Christine, K.S. (1996). Evaluation of Distance Education Instruction: An Evaluation Case Study. IEEE, FIE Proceedings, pp. 560–564.
- Cresswell, J.W. (1998). *Qualitative enquiry and research design*. London: Sage.
- Gaba, A., Dash, K. & Nirod, K. (2004). Course Evaluation in Open and Distance Learning: A Case Study from Indira Gandhi National Open University. *Open Learning*. Taylor & Francis Group Journals, Philadelphia, pp. 213–221.
- Johannes, M. (1989). Formative Evaluation of Distance Education: A Case Study of the Certificate in Adult Education at the University of Botswana. *Journal of Distance Education*.
- Lien, A.J. (1967). *Measurement and evaluation of learning*. Iowa: William C. Brown.
- McKeachie, W.J. (2006). *Teaching tips: Strategies, research, and theory for college and university teachers*. 12th ed. Boston: Houghton Mifflin.
- Moore, M.G. (1972). Learner autonomy: The second dimension of independent learning convergence, 5(2), pp. 76–97.
- Neil, M.W. (Ed.). (1981). Education of adults at a distance. Report of the Open University's 10th anniversary international conference. London: Kogan Page.
- Owoc, M.L. Hauke, K. & Gładysz, T. (2000). Assessment as the essential function of distance learning applications. Proc. of the International Symposium on Telemedicine and Tele-education in Practice-ISTEP'2000, Kosice (Slovak Republic).

- Taylor, C. (1978). Designs in formative evaluation. In C.T. Fitz-Gibbon & L.L. Morris (Eds.). *How to design a programme evaluation*. London: Sage Publication, pp. 14–18.
- Weiss, C.H. (1972). *Evaluation research, methods for assessing programme effectiveness*. Prentice Hall.
- Williams, J.D. (1973). Course-component evaluation Part I: Rationale and outline. *Journal of Structural Learning*, pp. 25–31.
- Woodley, A. & Kirkwood, A. (1988). Evaluation in Distance Learning. In J. Jenkins, (ed.), *Commonwealth Co-operation in Open Learning: Background Papers*. London: Commonwealth Secretariat, pp. 291–98.