

Embedded Workplace Training for a skill development programme: Critical
Factors for Effective Implementation

Theme: Skills Development
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INTRODUCTION

The laboratory courses offered by open and distance learning institutions pose unique challenges for the educators as well as the learners. These are related to safety, cost and complexity of instruments (Gustafsson, 2002). The highly technologically intensive, computer based virtual learning environment is one of the used alternative. It satisfies the end users requirements and encourages learners' participation and incarnates the learning by doing rule (Qing Yu et al 2005). Computer simulations with reduced amount of real lab work have a lot of advantage for the learners. This offers advantages in time efficiencies so that the in-lab portion can be reduced in length (Kennepohl, 2001). Students in the university of South Africa UNISA (continents largest distance learners institution), have access to software for learning basic lab procedures and "home experiment kits" and for first year physics many courses also require a two weeks intensive lab course (Koenig, 2007). Compressed video and computer mediated communications have been employed in order to provide a dynamic distance learning environment (Khader and Barnes, 1996). The level of comfort with technology in general plays a role in attitudes towards distance education (Fredberg, 1995).

IGNOU has more than 420 programmes on offer out of which around 40 are skill based. The university has a system in place in which the lab work is conducted at the hired institutions called the Study Centres (SCs) or the Programme Study Centres (PSCs) located throughout the length and breadth of the country. Yet, delivery of such courses poses a challenge. These have low enrolment compounded with high dropout rate. In one of our early studies, the distance of study centre from the residence of the student and non availability of time for the laboratory component due to employment came up as prominent reasons for the student drop out (Fozdar et al 2007). The genesis of the dual mode strategy lies in the then perceived issues of time and distance.

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It prompted the development team of the Certificate Programme in Laboratory Techniques (CPLT) to plan for a student friendly 'embedded learning strategy' invoking and promoting the culture of work place learning.

Issues concerning workplace learning in the context of CPLT are the main focus of this paper. At the time of launching of CPLT, the factors encompassing learning embedded amidst the workplace functions (which we shall refer to as 'embedded learning') or the instructional implications from the relevant learning theories were not taken into account;. We feel it essential (in hindsight) to consider these aspects to ensure effective program delivery. We make a beginning with aspects related to 'embedded learning'. This refers to building of at least a part of formal learning activities amidst the workplace context. Based on an article published by Michael Littlejohn, United Nations System Staff College (2006) has specified the following factors for successful implementation of embedded learning:

- i. Immediacy of the learning context, content and activities to the functions and tools in the workplace
- ii. Orientation of the organisational culture towards collaboration and knowledge sharing
- iii. Senior staff to function as mediators in knowledge transfer
- iv. Multiple modes of presentation of content inclusive of appropriate technology

Nadia Damon (2008) insisted on the need for long term strategy, integrated learning structures, creation of thirst for learning among workforce, provision for coaching, mentoring and timely feedback, and management support as key elements for embedded learning. Many of the factors mentioned above are reinforced through learning theories as well. To gather the implications of the learning theories to work place learning, we focus on situated cognition theory, Bruner's theory on cognitive growth, Vygotsky's socio-cultural theory and constructivism (Driscoll, 2000).

Implications of Learning Theories

- i. Curriculum should be relevant to day-today functions of the laboratory staff.
- ii. The senior staff in the workplace should function as the counselors to provide scaffolding service and be willing to be involved in intersubjectivity while considering solutions for relevant workplace issues.
- iii. Learning under workplace should provide opportunities for participation in the activities of relevant communities.
- iv. Multiple avenues must be made available to lead the learner through the path of cognitive conflict. Variety of work related contexts need to be made part of the curriculum to provide for a problem solving approach.
- v. The progress of the learner towards symbolic representation from enactive and iconic representations should be tracked and ensured, so that transferable skills are achieved.
- vi. Learning should provide opportunities for social negotiation with peers as also with mentors.
- vii. A feeling of self-awareness needs to be instilled in learners, so that they could reflect on what needs to be done to keep abreast of recent developments in their work roles.
- viii. The assessment needs to be made integral part of learning (*i.e.*, *in-situ* assessment is to be encouraged) in the learning environment.

ABOUT CPLT PROGRAMME

CPLT programme launched in July 2001 is an 18 credit certificate programme with 4 core courses in all in which the first course is common to all the labs while the other three pertain to the laboratories in chemistry, life sciences and physics. It is of six months duration with a flexibility of completing in two years time. The curriculum was designed keeping in mind the skill enhancement and capacity building of the laboratory staff employed in college and school science labs, as also the skill development of aspirants for employment in such labs. The process at the initial stages involved all the stake holders; people from industry, national labs and from the labs of Schools and Colleges including some of the potential candidates. The weightage of hands-on work is about 50% in three courses while it is 33% in one general course.

With an exhaustive lab component as per IGNOU norms, the learners have to perform experiments and activities for 28 days (7days each for the four labs) in total in the entire course including the exam days. A good consideration was given to the fact that distance and time constraint are the significant factors while delivering lab based science courses where the attendance is compulsory for learners to complete the lab work. The learners of the CPLT programme were provided a facilitation of doing 50% of the work at their work place if they were employed. The rest of the 50% work is to be done at the regular Study Centres affiliated to the Regional Centres (the permanent regional offices of the University). The learners completing their work by this strategy were called the **Mode 1** students while those completing all their work at the

Study Centres were called the **Mode 2** students. There were well defined evaluation strategies for both the modes.

RESEARCH HYPOTHESIS

The main aim of this research study was to gather a profile of the CPLT students and assess the utilization of a learner friendly strategy provided to them which none of the other skill based programmes of IGNOU were able to offer at that point of time. It was hypothesized that the learners will make full use of the facility of work place lab work as it was expected that many of them would be employed. It was also presumed that they would get full cooperation from their employers in terms of getting leave easily for doing exhaustive hands on work and also time will be made available to work at their work place during the working hours or otherwise.

METHODOLOGY

A structured questionnaire was developed that consisted of 31 items. The survey sample consisted of CPLT students enrolled during 2003 to 2008 academic years. The questionnaire was sent by post to almost 800 students enrolled till 2008. One follow-up reminder was also posted to elicit some more responses seeing a poor initial response. A total of 80 students had completed the questionnaires most of which have been from Delhi (55) and 25 from outside Delhi. Some attempts were made in 2009 also by interviewing around 20 students during the last session of their lab work when the faculty visited the Study Centre as examiners albeit only in Delhi Study Centres. A low response rate may be attributed to non updating of the correspondence addresses of the learners or perhaps students were simply not willing to participate. The data collected from students was analysed using percentages.

ANALYSIS AND DISCUSSION

The general background of the learners indicates rural (50%), urban (40%) and 10% belonging to township area. The sample comprised of 85 percent males and 15 percent females and the respondents were in the age group of 21 to 40 years. The eligibility for the programme requires that a student with twelve years of schooling can take admission straight away while the ones with 10 or 11 years of schooling need to have a working experience of one and two years' respectively. It is, however, interesting to find that more than half (55%) candidates had an undergraduate science degree; 5% had a post graduate degree while the rest were as per the stipulated requirements. In addition to this, 40% of them are employed and have an experience (10 to 20 years) of working in a science lab. Sixteen percent of the learners could easily get permission to join the programme, around 5% with some difficulty while some 2% had to persuade their employers to a large extent. As regards the reason for joining the programme, only 10% enrolled for getting an employment, 10% for gaining knowledge and skills and the rest for getting promotional benefits. It is significant to note that all the respondents self financed for the programme; of these 40% opined that the amount of fee is reasonable; about 20% thought it to be quite high whereas a few (15%) felt it to be low. The rest of the items in the questionnaires pertained to the main research hypothesis aimed at assessing the utilization of mode 1 having the facility of work place learning and the associated reasons.

The learners were first asked about the mode in which they completed their programme or were pursuing it. A meager 25% of the learners belonged to the *Mode 1* category in which they were supposed to be performing almost 50% of the lab work at their place of work. It is worth mentioning here that the students have to give their choice for the mode right at the time of filling the application form, however they had an option of changing the same if desired. The next item sought whether they changed their mode after admission and the reason for the same. To our dismay, there were nil response to this item. A number of items in the questionnaire pertained to the implementation of *Mode 1*. It is observed that the entire *Mode 1* students, albeit small in number, performed the work place component of the laboratory courses in the manner detailed in

the programme guide and the counsellor's manual and the evaluation methodology was also followed as directed. This gives a satisfactory indication of the future possibility of the work at the work place.

For the *Mode 2* students, which followed the usual practice of the University of performing all the lab work at the Study Centre, getting leave from the work place is one of the main issues and only 20% indicated that they could get leave easily to attend the lab work. This fact substantiates the time constraint with most of the employed distance learners as also indicated by the number of research studies on the skill based distance lab programmes. Perhaps that could have been one of the reasons for some of the Study Centres conducting lab work during week ends also (15%) on the item seeking a choice between the two modes and choosing amongst the reasons given. Very few (20%) of those who responded to this items commented only on the reason given as 'for convenience' and the choice was 50% for both the modes. Towards the end some open ended items were included in the questionnaire asking for what their expectations from the programme before taking admission were and whether these expectations were fulfilled or not? The expectations are listed as:

- Gain of practical skills for working in a science laboratory (35%)
- Getting a certificate which would help them in their promotion (40%)
- Getting an employment in the science labs (25%)
- Get into self employment (5%)

40% of them indicated that the expectations were fulfilled to a good extent while the rest were not satisfied. The fulfillment of the expectation has a direct implication on the motivational level of the learners enrolled and also the peers. The last open ended item in the questionnaire was left for any other overall comment in which a good percent (30%) of respondents indicated that the programme is good for the job seekers and also for upgradation of skills.

The outcomes of the interviews, of the learners in *Mode 2*, revealed the following reasons for their not opting for the facilitating *Mode 1*.

- Lack of awareness of the facility of doing some part of lab work at the place of work
- Time constraint from the students' point of view due to busy schedules at the place of work on account of duties to be performed
- Lack of cooperation from the persons of the institution who were to act as counsellors for 3 days of work for each lab
- Lack of peer group interaction in the *Mode 1*.

We would also like to mention that during the interviews the students complained about the non conduct of lab courses at various study centres. In fact the faculty had received complaints in this regard and discovered that this was due to abysmally small number of students enrolled with a particular study centre. This has added to the low motivation level amongst students.

The reasons stated by a number of students compel the faculty in IGNOU to introspect on many aspects.

- Was a strategy planned to propagate the facility of doing lab work at the work place so that the factors suggested for workplace learning (by United Nations System Staff College) and the implications of learning theories are accommodated?
- What measures need to be taken to bring about a change in the institutional culture that believes only on informal training as the mode of capacity building in the laboratory staff? How do we impress on the institutions that, the informal learning opportunities that the laboratory staff could get, may at the most lead them to enactive representation or iconic representation but not to symbolic representation?
- Before planning this strategy were norms worked out clear cut for the persons who were to be involved as resource persons or the counsellors to the students interested in

carrying out practical work at their work place? (The norms would include the remuneration of the person acting as a counsellor, the infrastructural facility which the learner would be using during the lab course the expenditures on account of apparatus and chemicals the availability of time of the person involved, etc.)

- Why did the enrolment pattern indicate a consistent poor number over the past 10 years? What remedial measures could be taken to increase the enrolment? How could the motivation level of the students be elevated?
- Were the roles and responsibilities of the stakeholders specified before giving an offer?
- What are the lacunae that prohibited the popularization of a programme not offered by the formal stream from any institution in the country?
- Were any steps taken in the past to link the programme to some form of incentive?

CONCLUSION

The roadblock in initiating anything different from the routine is inevitable; however, if we forget about the technology part, we can say that the *Mode 1* has been a novel effort in the distance lab course delivery, especially for a country like India where online and internet technology is still beyond the reach of many. None-the-less it is essential that for a non-prevalent strategy efforts should be made to involve all the stakeholders and orient them in such a manner that the chances of ambiguity are too feeble and the maximum utilization is made. It is recommended that the delivery methodology for the CPLT programme is reworked out in the light of the factors suggested by United Nations System Staff College for workplace learning and accommodating the implications of learning theories discussed *ibid*. It is suggested that the employers should be again apprised of the significance of a programme in terms of the continuing education needs and skill development of the laboratory staff and also open gates for all those looking for jobs in this area. It has to be ensured that the roles, responsibilities and the other requirements of the people at work place are also specified in a fool proof manner so that every body is accountable for their duties. A serious effort needs to be made towards the elevation of the motivation level of the learners and see if anything could be worked out in the direction of waiving off the fee, paying an increment or giving promotional benefits to the successful candidates of the programme. The reworked out delivery strategy can be extended to other laboratory courses being offered by the university.

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