ISSN. 0972 - 8406

The NEHU Journal, Vol XV, No. 2, July-December 2017, pp.113-126

Knowledge of ICT and Computer Proficiency in College and University Teachers: A Survey

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Abstract

The purpose of this paper is to describe trainee teachers' ICT literacy and computer proficiency. Data is collected through questionnaires administered to 475 Assistant Professors and Assistant Librarians who attended Orientation Programmes and Refresher Courses conducted by the UGC-Academic Staff College, North-Eastern Hill University, Shillong during the academic session 2011-2012; Data obtained was statistically analysed. Findings from this study contribute to our understanding on their computer proficiency and competencies and required institutional support, etc.

Keywords: Academic Staff College, ICT, Assistant Professors, Assistant Librarians, HigherEducation

Introduction

In higher education,where technological innovations have transformational impact on teaching and learning, the increased technological literacy among faculty is of central importance (Mayberry et al., 2012; Zarei, et al., 2014). It is seen that computer-based systems have great potential for generating teaching and learning resources. The rapid development of Information and Communication Technology (ICT), particularly the internet, is one of the most fascinating phenomena characterizing the Information Age (Sarkar, 2012). The emancipatory and transformative potentials of ICT in higher education in India have helped increase the country's requirement of higher education through part-time and distance-learning schemes. ICT

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has the potential to remove the barriers that are causing the problems of low rate of education in any country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education, as well as to overcome time and distance barriers (McGorry, 2002). By its very nature, ICT calls for innovation and it is about exploiting the full capabilities of technology to open new perspectives for teachers. Success of ICT-based education depends upon the teacher's ability to keep pace with the developments since teachers are responsible for quality control, improvement of learning and the aggregate effectiveness of the learning process (Balasubramanian and Clarke-kah, 2009).

The importance of teachers' ICT capabilities has been recognized in a variety of countries, with many researchers arguing that "Teachers need to be able to handle the technology with confidence" (Preston, et al., 2005). One of the main rationales for the development of teachers' ICT-related capabilities is the improvement of students' learning outcomes and the enhancement of their ICT literacy (Markauskaite, 2007). There is a continuing debate on the balance between teachers' confidence with ICT as a technology and teachers' confidence with ICT as a tool for enhancing the quality of teaching and learning in their subject. Various studies on trainee teachers have shown that a very high proportion enter universities being already competent and confident ICT users (Albion, 2001; Simpson, etal.,1999). However, other studies have demonstrated that the level of the technical capabilities to use ICT is highly overestimated (Forster, et al.,2005; Taylor, 2003; Watson, 1997).

The history of using computer technology for learning is replete with promises and disappointments (Rosenberg, 2001); computer technology has not fulfilled its potential to bring significant and desirable changes in education (Ginserb and McCormick, 1998), and remains mostly underutilised, as it has not been implemented in appropriate, effective and creative ways.

Objectives:

The present study undertaken through a survey, seeks to gain insight into the teacher's perception of integration of ICT in their professional development. The objective of our study is to:

a) understand the general awareness amongst teachers about ICT in general and their capabilities in using ICT in teaching-learning.

b) examine the institutional support provided to teachers in adopting ICT in their professional development.

Methodology:

A survey questionnaire was designed and prepared (Keengwe and Anyanwu, 2007; Gallivan, et al., 2005) to collect primary data pertaining to our study. The first section of the questionnaire included demographic information. The second section consisted of questions for assessing the degree of computer related capabilities, and the third section consisted of questions for assessing the ICT awareness and its integration in instructions to enhance students learning. The data obtained in the study were analyzed statistically.

The questionnaires were distributed to 488 Assistant Professors and Assistant Librarians from almost all states of the country, who attended the Orientation Programmes (OPs) and Refresher Courses (RCs). Altogether five OPs and fifteen RCs (in Library and Information Science, Hindi, Education, Botany, Economics, Geography, Political Science, History, Commerce, Zoology, Philosophy, Tribal Studies, Mathematics, English and Chemistry) were conducted by the University Grants Commission (UGC)-Academic Staff College (ASC), North-Eastern Hill University (NEHU), Shillong during the academic session 2011-2012. Of the 488 surveys distributed, 475 completed surveys were received, yielding a response rate of 97%.

Results and Discussions:

The descriptive statistics performed on the demographic information for the six variables i.e. gender, age, category, designation, qualification and nature of appointment were obtained in percentage. In the OPs there were 61.27% male and 38.73% female participants, whereas in the RCs there were 59.68% male and 39.68% female participants, between the age group of 25-55 years (Table 1; Fig. 1a). It was observed that for both OPs and RCs most of the participants belonged to the Scheduled Tribe (ST) category, followed by General (Gen), Other Backward Classes (OBC) and Scheduled Caste (SC) respectively (Table 1; Fig. 1b). The majority of the respondents in both OPs and RCs are teachers in the level of Assistant Professors who were appointed on a regular basis and having a minimum qualification of Masters Degree (P.G) (Table 1; Fig.1c).

Information on computer related capabilities of the respondents are represented in a tabular form (Table 2 and 4), and through bar charts (Fig. 2). We find that, respondents who owned a computer were 89.60% for OP, and 85.71% for RC, whose purpose of use was mainly for MS-office, internet and others (Table2; Fig. 2a, b). A significant difference was observed in users for MS-office between participants who attended the OP and RC as

indicated by t-value equal to 3.48 at $p<0.05$ (Table 4; Fig. 2b), suggesting that there are more MS-office users amongst the OP participants, than in the RC. Similarly, there is a significant difference in the number of users for internet between OP and RC respondents, whose t-value equal to 2.91 at $p<0.05$ (Table 4; Fig.2b), suggesting the same trend as above. The use of internet for mailing purposes, downloading documents and research work between OP and RC respondents, also shows a significant difference at t-value equal to 3.41, 3.09 and 2.86 respectively and $p<0.05$ (Table 4), indicating that participants of OP utilize the internet more for the above three reasons, as compared to the participants of RC. The amount of time spent on the internet i.e. <30 minutes, between 30-60 minutes, and>90 minutes, is found to be almost similar between the participants of the OPs and RCs (Table 2). However, a significant difference is observed at t-value equal to 3.48 and $p<0.05$ (Table 4.) on the amount of time spent for the 60-90 minutes duration (Table 2), indicating that participants of the OPs spent more time on the internet as compared to the other group. The result obtained for duration of use of internet (Table 2; Fig. 2d) more or less supports the results obtained for amount of time spent on the internet showing that there is not much difference between the two groups, for the four responses i.e. Every day, Several times a week, Several times a month and Rarely.As indicated in Table 2; Fig. 2e, the comfort level in using the computer or internet is almost similar between the participants of OPs and RCs, and from their responses it is clear that they were excellent as well as satisfactory in their comfort level for using computers. However, a significant difference was observed between the participants of OPs and RCS, in their response to good comfort label at t-value equal to 3.53 and $p<0.05$ (Table. 4). From the mean value, which is also the highest as compared to all the three responses i.e. excellent, good and satisfactory we can conclude that participant of OPs are more comfortable in using the computer or internet, when compared to the participant of RCs (Table 4).

Information on ICT awareness and the integration of ICT in teaching are represented in a tabular form (Table 3 and 4), and through bar charts (Fig.3).As seen in table 4, a significant difference was observed between the participants of OPs and RCs, in the manner in which knowledge was acquired in using ICT. We find a t-value of 4.76 and $p<0.001$ for knowledge through IT training, a t-value of 3.30 and $p<0.05$ for knowledge acquired by self-instruction, and at t-value of 2.82 and $p<0.05$ for knowledge acquired from work place, respectively. It is very much evident from the results that

in both groups (OPs and RCs), majority of the participants acquired knowledge on ICT by self-instruction (Table 3; Fig. 3a)

Also, a high significant difference is observed at t-value of 4.71 and $p<0.01$, for the role played by ICT in making professional work easier between the participants of the OPs and RCs (Table 4; Fig. 3b). It was also observed, that there is a significant difference at t-value equal to 2.75 and $p<0.05$, in the number of participants using ICT for preparing reading material (Table 3 and 4). Similarly, there is a significant difference in the number of participants using ICT for making Power Point presentation for lectures between participants of the OPs and RCs at t-value of 3.83 and $p<0.05$ (Table 3 and 4). These results certainly indicate that participants of OPs are more aware of ICT and more proficient in using it in their professional development. We also find a high significant difference at t-value of 4.40 and $p<0.001$, between the responses of OPs and RCs participants, in the role of ICT in the world of teaching with respect to revolutionizing teaching profession (Table 3 and 4; Fig. 3c). There is also a significant difference between the participants of the OPs and RCs, in the response that the implementation of ICT awareness in the college or university is satisfactory at t-value of 5.10 and $p<0.001$ (Table 4; Fig. 3d).The results obtained in Table 2 and Table 3 for their response on Place of internet access; Rating ICT awareness in college/university; and Lack in their use/implementation of ICT in teaching, strongly points out that the Institutional support in ICT is not satisfactory, as also indicated by Ginserb and McCormick, 1998. Furthermore, a very high significant difference in the response of the participants of the OPs and RCs was observed at t-value of 4.33 and $p<0.001$, for the awareness courses conducted on ICT by the Academic Staff College, NEHU (Table3 and 4), thus indicating strongly that sessions on ICT were conducted more in the OPs than RCs. Both the participants of the OP and RC agreed that ASC should conduct more awareness courses on ICT.

Conclusion

In conclusion, we can say that the present work based purely on the responses received from the respondents, strongly indicate that participants of the Orientation Programmes are more competent and confident ICT users than those of the Refresher Courses. Various studies on trainee teachers have shown that a very high proportion who enter universities are already competent

and confident ICT users (Albion, 2001; Simpson, et al., 1999), while some researchers argue that trainee teachers enter teacher education programs with variable computer skills (Drenoyianni, 2004) and some trainees' confidence and ICT expertise stop at the level of basic technical skills (Watson, 1997). Since participants of Orientation Programmes are mostly new entrants, in the age group of 30-40years, we can probably class them as digital natives in comparison to the participants of Refresher Courses, comprising of teachers in the age group of 35-50 years, and having more teaching experience, as digital immigrants. The result obtained regarding ICT awareness is quite worrisome, though 80% of them are aware of ICT which they have acquired it through self-instruction. The question that poses in our mind is "Is self-taught well taught?" 90% of the respondents,who agreed to the need for training, supports our training programme as a platform for their enrichment in ICT.

Teachers are a key component in the learning environment and therefore the impact of ICT on teachers and the strategies they employ to facilitate the environment are critical. This research paper is a humble beginning in giving us an insight to the concept that teachers hold about ICT. The results generated indicate inadequacies in their knowledge and skills regarding ICT, thus prompting us to further our research, so that we can work out on strategies to improve our training programmes. Moreover, the research models presented in this paper may serve as a platform for researchers and practitioners interested in training, learning and IT usage in higher education.

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Table 1 : Demographic Information in Percentage

			Orientation Programme	Refresher Courses
1.	Gender	Male	61.27	59.68
		Female	38.73	39.68
2.	Category	ST	44.51	44.44
		SC	7.51	3.49
		OBC	17.34	12.38
		General	29.48	33.02
3.	Qualification	P.G	50.29	54.92
		M.Phil	22.54	16.51
		Ph.D	25.43	23.81
4.	Designation	Teachers	92.49	90.16
		Librarian	2.31	6.03
5.	Nature of Appointment	Regular	97.69	91.11
		Part time	0.00	0.32
		Adhoc	0.00	1.90
		Contract	1.16	1.59
6.	Age	25-30yrs	5.78	2.86
		30-35yrs	38.15	18.73
		35-40yrs	27.17	33.33
		40-45yrs	12.14	18.73
		45-50yrs	5.78	9.52
		50-55yrs	1.16	2.22

Table 2 : Computer Related Capabilities in Percentage

			Orientation Programme	Refresher Courses
1.	Own a computer	Yes	89.60	85.71
		No	9.83	11.11
2.	Purpose of use of computer	MS-Office	81.50	72.70
		Internet	82.66	81.27
		Others	37.57	32.70
3.	Internet access	Yes	74.57	73.97
		No	24.28	20.32
4.	Place of internet access	University/College	21.97	20.00
		Cafe	12.72	16.51
		Others	10.98	0.32
5.	Duration of use of internet	Everyday	56.07	42.54
		Several times a week	24.28	32.70
		Several times a month	14.45	15.24
		Rarely	4.05	5.71
6.	Purpose of use of internet	Email	75.72	64.13
		Research	83.81	73.65
		Document download	75.144	67.94
		Social Networking	44.50	33.33
		Others	15.60	8.57
7.	Amount of time spent on internet	<30mins	8.67	12.38
		30-60mins	32.37	37.46
		60-90mins	40.46	32.70
		>90mins	16.18	12.06
8.	Comfort level of using internet	Excellent	15.03	13.02
		Good	43.35	35.56
		Satisfactory	36.42	43.81
		Poor	4.62	2.86

Table 3 : ICT Awareness and Integration in Teaching in Percentage

			Orientation Programme	Refresher Courses
1.	ICT Awareness	Yes	85.55	80.00
		No	9.83	12.70
2.	ICT Awareness through	IT training	20.23	14.29
		Self instruction	68.79	64.13
		Work place	35.84	33.33
		Others	8.67	8.57
3.	ICT makes work	Pleasurable	39.88	37.14
		Easier	78.61	66.98
		Avoid using	0.00	3.49
		Others	2.31	3.49
4.	ICT is used for	Preparing material	65.32	68.25
		PPT	60.69	43.49
		Others	14.45	12.06
5.	ICT development to	Revolutionize teaching	82.08	71.11
		Replace textbook	5.20	12.70
		Others	12.14	8.89
6.	ICT lack due to	Hardware	40.46	28.89
		Pedaware	12.72	8.57
		Software	54.34	51.75
		Others	9.83	7.62
7.	Rating ICT college/university awareness	Excellent	10.98	15.56
		Satisfactory	61.27	55.87
		Poor	26.01	24.76
8.	ICT training conducted by ASC	Yes	95.95	68.89
		No	1.73	23.17
9.	ICT should be introduced by ASC	Yes	75.72	85.08
		No	20.23	6.98

Table 4 : Statistical Analysis

FACTORS CONSIDERED	Orientation Programme		Refresher Course		
	Mean	stdev	Mean	stdev	t-value
Accessing the Internet	25.80	8.79	15.53	3.78	2.54
Purpose of using the Computer					
1. MS-office	28.20	7.92	15.27	4.40	3.48*
2. Internet	28.60	8.56	17.07	4.04	2.91*
Internet access from University/College	7.60	5.13	4.20	1.86	1.45
Use the Internet for the following purposes:					
1. For sending & receiving mails	26.20	8.11	13.47	3.46	3.41*
2. For downloading document	26.00	8.15	14.27	4.10	3.09*
3. For Research work	29.00	10.34	15.47	3.93	2.86*
Time spent on the Internet per session					
1. Up to 30minutes	3.00	2.92	2.60	1.88	0.29
2. 30-60minutes	11.20	4.44	7.87	4.00	1.49
3. 60-90minutes	14.00	4.24	6.87	1.30	3.48*
4. More than 90minutes	5.60	4.39	2.53	1.30	1.54
Comfort Level in using the Internet/Computer					
1. Excellent	5.2	2.86	2.733	2.09	1.78
1. Good	15	4.53	7.47	2.59	3.53*
1. Satisfactory	12.6	3.05	9.2	3.67	2.05
Acquired Knowledge of using ICT					
1. Through IT-training	7.00	1.41	3.00	2.14	4.76***
2. By self-instruction	23.80	6.72	13.47	3.38	3.30*
3. In work place	12.40	3.78	7.00	3.48	2.82*
Role of ICT in professional work					
1. Make work more pleasurable	13.80	6.38	7.80	2.11	2.07
2. Make work easier	27.20	5.93	14.07	3.31	4.71**
Implementation of ICT in teaching					
1. For preparing reading material	22.60	6.35	14.33	3.87	2.75*
2. For making PowerPoint presentation for lecture	21.00	6.56	9.13	3.89	3.83*
Role of ICT in the world of Teaching					
1. Revolutionize teaching	28.40	6.58	14.93	3.24	4.40***
2. Replace textbooks and no major change	1.80	1.30	2.67	1.59	1.22
Implementation of ICT awareness in college/University					
1. Excellent	3.80	3.03	3.27	1.58	0.38
2. Satisfactory	21.20	3.42	11.73	4.06	5.10***
3. Poor	9.00	5.15	5.20	2.70	1.58
Academic Staff College, NEHU is giving awareness courses on ICT	33.20	9.12	14.47	5.63	4.33***
Academic Staff College, NEHU should gave more awareness courses on ICT	26.20	7.56	17.87	3.40	2.38

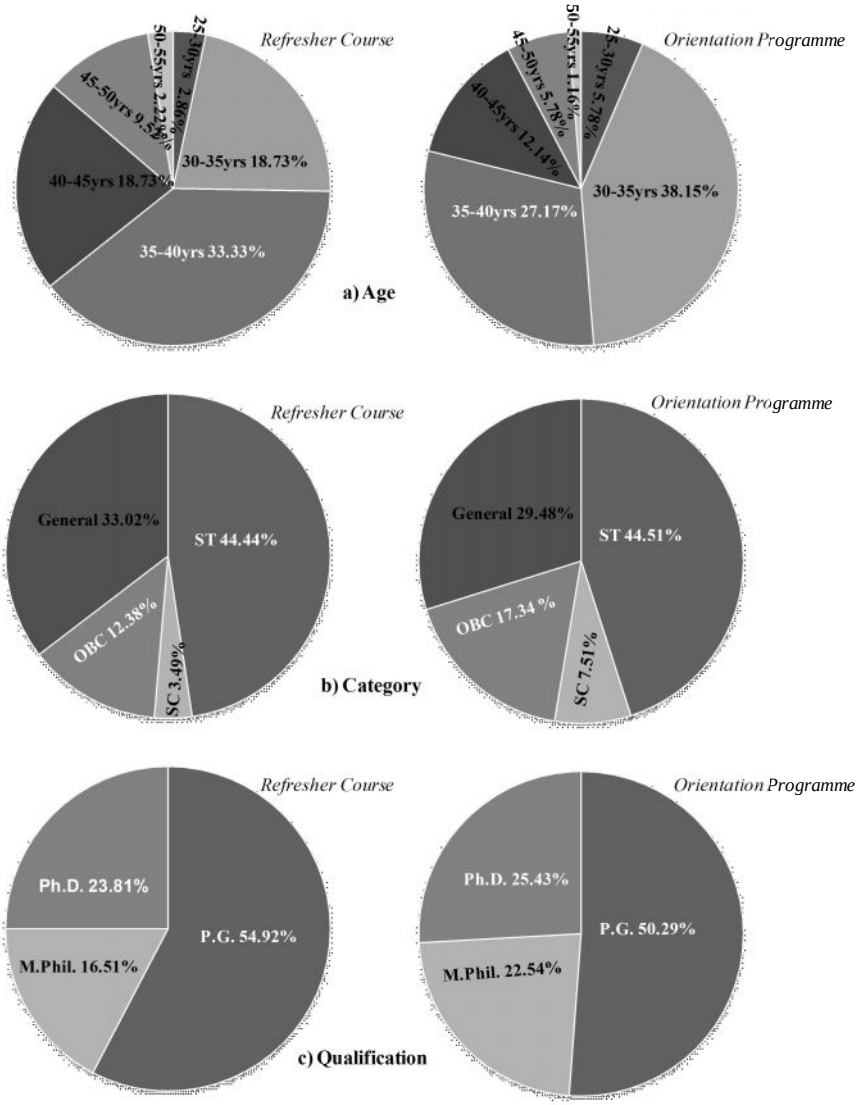

Fig 1: Demographic Information

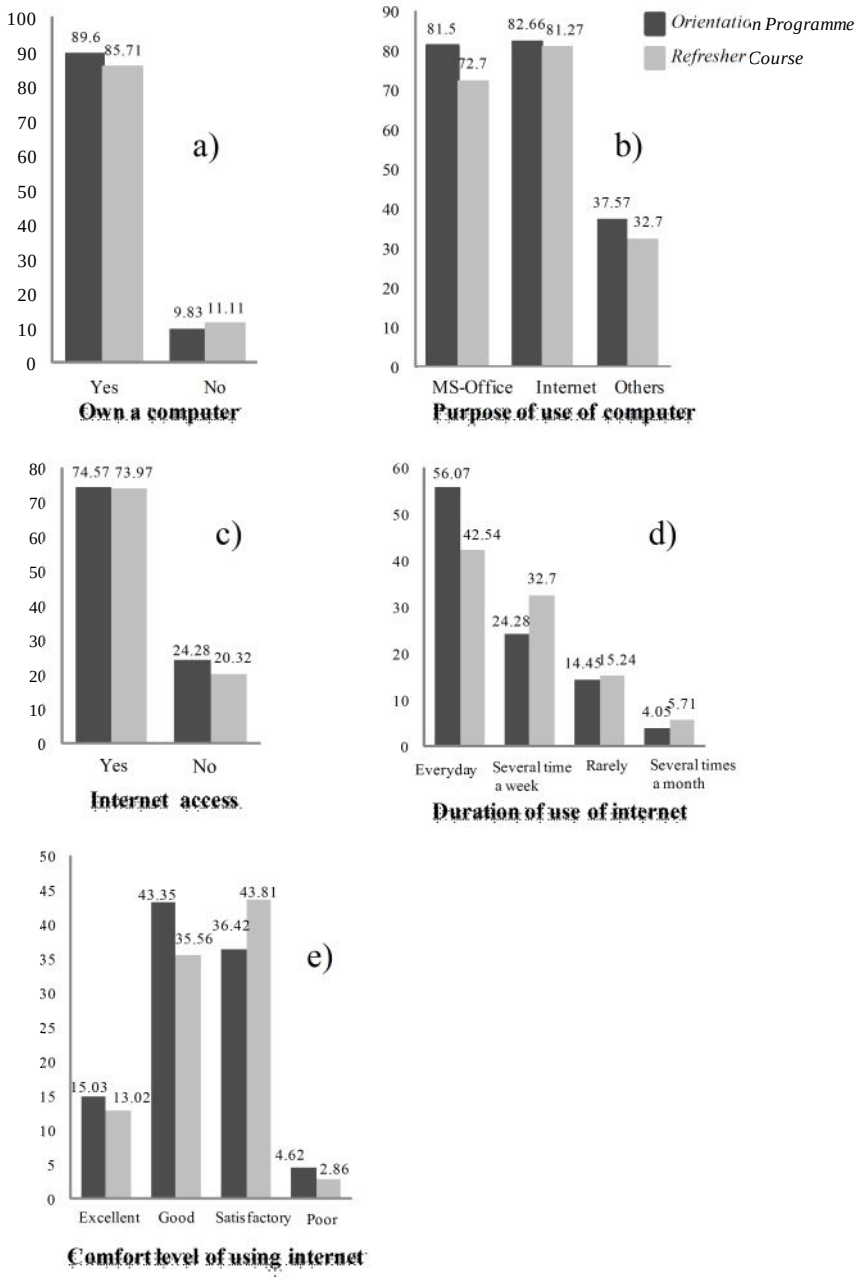

Fig 2: Computer Related Capabilities

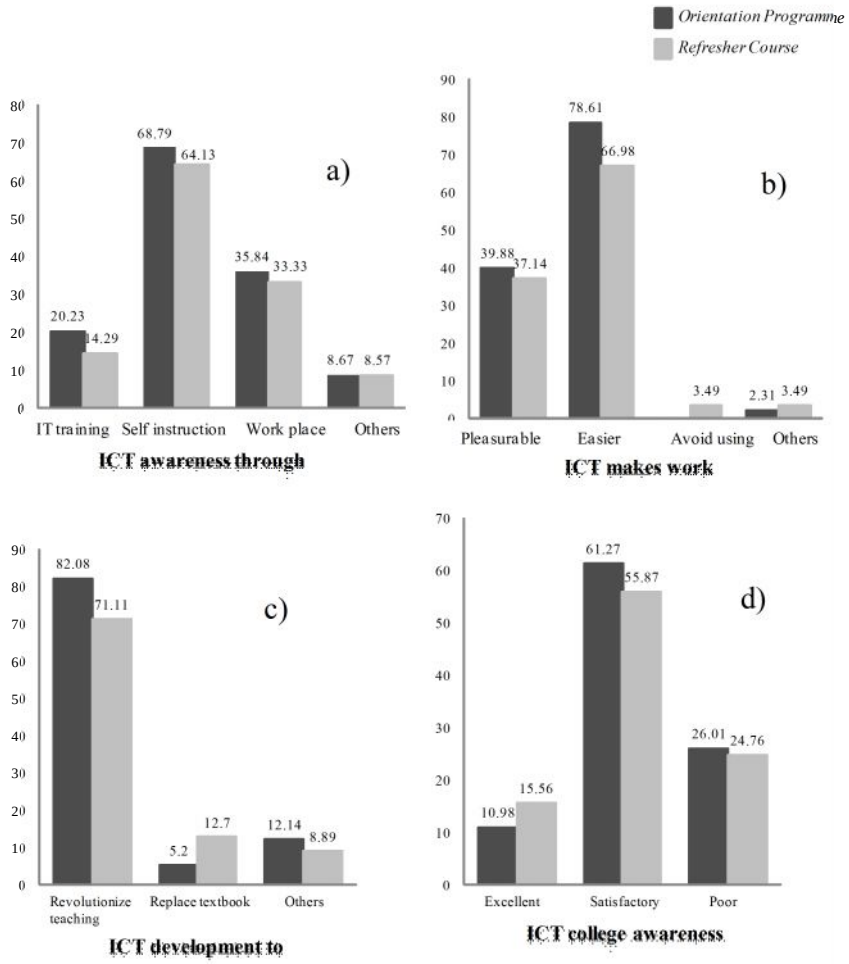

Fig 3: ICT Awareness and Integration in Teaching