ISSN: 2277-9655
Impact Factor: 3.785

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

INFORMATION AND COMMUNICATION TECHNOLOGY RESOURCES IN TEACHING INDUSTRIAL SUBJECTS AT NAVAL STATE UNIVERSITY

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DOI: 10.5281/zenodo.51846

ABSTRACT

This study aimed to assess the Information and Communication Technology resources in teaching industrial subjects at Naval State University, Naval, Biliran. The descriptive research design was used in this study to gather data on the utilization of information and communication technology resources in teaching Industrial Technology subjects at NSU for school year 2012-2013.

In terms of the profile of the teachers, most of them were on the academic rank of Instructor. Many of the teachers were inclined to obtain graduate degrees. Most of the teachers lacked adequate trainings and seminars related to Information and Communication Technology.

The teachers preferred to utilize ICT resources in instruction to the BSIT students. The university had moderately adequate level of adequacy of the ICT resources. In the relationship of variables, there was no significant relationship between the profile of the teacher-respondents and the extent of utilization of ICT resources in instruction. There is significant relationship between the attitudes of the teachers toward ICT resources, the level of adequacy and extent of utilization of ICT resources in teaching.

KEYWORDS: ICT resources, extent of utilization, Industrial Technology subjects, Naval State University

INTRODUCTION

Information and Communication Technology is a major factor in shaping the new global economy and triggering rapid change in society. Within the past decades, the new ICT tools have fundamentally changed the way people communicate and do business. They have produced significant transformation significant transformation in industry, agriculture, medicine, business, engineering, and other field. They also have potential to transform the nature of education: where and how learning takes place and the role of student and teachers in the learning process. (Information and Communication Technologies)

Industrial technology must assume a leadership role in the transformation of education or it will be left behind in the swirl or rapid technological change. For education to reap the full benefits if ICT's in learning, it is essential that pre-service and in-service teachers gain basic ICT skills and competence. Industrial technology must provide the leadership for pre-service and in-service teachers and use as model the new pedagogies and tool for learning. They must also provide leadership in determining how the new technologies can best be used in the context of the culture, needs, and economic condition in their country. To accomplish these goals, teacher in industrial technology must work closely and effectively with teachers and administration, national or state education agencies, teachers unions, business and community organizations, politicians and other important stakeholders in the education system. Industrial technology also need to develop strategies and plans to enhance the teaching-learning process within to assure that all future teachers are well prepared to use the new tools for learning. (Information and Communications Technologies).

Teachers remain the gatekeeper for student's access to educational opportunities afforded by technology: they cannot and should not be ignored.

Providing technical skills training to teachers in the use of technology is not enough. Teachers also need professional development in the pedagogical application of those skills to improve teaching and learning. Traditional one-time teacher training workshops have not been effective in helping teachers to feel comfortable using technology or to successfully integrate it into their teaching. Instead, a new paradigm is emerging that replace training with lifelong professional preparedness and development of teachers. (Haddad, 2000). This approach includes pre-service and in-service training, as well as on going pedagogical and technical support and mentoring.

While technology increases teachers' training and professional development needs it only offers part of the solution. Information and Communication Technologies (ICTs) can improve classroom instruction by providing access to more and better education online resources and offering multimedia simulations of good teaching practice. ICTs also enable professional development at a distance, asynchronous learning, and individualized training opportunities. Finally, ICTs can overcome teacher's isolation, breaking down their classroom walls and connecting them to colleagues, mentors, curriculum experts, and the global teacher community on a continuous basis. (Carlson, 2002).

In the Philippines, the Commission on Higher Education (CHED) formerly called the Bureau of Higher Education is tasked by the government to set up policies and standard for Industrial technology by way of setting up expectations, conducting conferences, consultation, and encouraging linkage or consortium among higher education institution. As such, State Universities and Colleges were created to offer industrial technology course in the Philippines under the supervision of the Commission on Higher Education.

The industrial technology in Naval State University envisions being the center of development for training and development of globally competitive technologists and service providers equipped with job intelligence, positive work habit and environment friendly attitude (www.nsu.edu .ph.).

CHED Memorandum Order (CMO) No. 30, Series of 2004 provide the Revised Policies and Standard for Undergraduate industrial technology. Article 1, Section 1 states that "Quality pre-service teacher education is the key factor in quality Philippines education, the pre-service preparation of teachers for primary and secondary educational sector is a very important function and responsibility that has been assigned to higher education institutions. All efforts to improve the quality of education in the Philippines are dependent on the service of teachers who are properly prepared to undertake the various important roles and functions of teachers. As such, it is of utmost importance that the higher standards are set in defining, the objectives, components, and processes of the pre-service teacher education curriculum".

In the Accrediting Agency of Chartered Colleges and Universities in the Philippines, Inc. (AACUP) evaluation instrument, Area III, this is on Curriculum and Instruction, one of the significant items to be observed is the integration/ application of the Information and Communication Technology.

To develop globally competitive technologist is to inculcate among the teachers the use of Information and Communication Technology in the enhancement of course content, teaching – learning process and enrichment activities. However, "teachers cannot give what they don't have" especially in the utilization of Information and Communication Technology in their classrooms, in which most of the teachers do not have the necessary ICT training skills in the utilization of ICT in instruction. Indeed, it was observed that there is an inadequacy of ICT resources in the College or industrial technology which serves as training grounds for future technicians or teacher.

The question on whether State Universities and Colleges such as NSU have adequate ICT resources and how far these are being utilized in instruction is a very interesting and probing research interest – all of which present pressing importance and concern in an effort to foster quality education. This problem urged the researcher to bring out corresponding solution; hence, this study was conducted.

METHODOLOGY

The descriptive research design was used in this study. This method is considered appropriate since the attainment of the objectives and the presentation and discussion of the results and findings were mainly through descriptions. The

venue of the study was at the Naval State University particularly in the College of Industrial, Information and Communication Technology where the teachers chosen as respondents teaching Industrial Technology subjects.

The main data gathering instrument used is a survey questionnaire. The instrument was subjected to a validation since this was a researcher-made test. To ensure reliability and validity of this instrument, the whole questionnaire was submitted to a panel of experts to improve some items in the instrument. The researcher conducted a dry-run to determine which statements and items should be included and eliminated that maybe inadequate, vague and insufficient.

The researcher sought permission and approval from the President and the Dean of the college where the respondents were selected of the University to allow him to conduct the study.

Upon the approval of the letter, the researcher administered the instrument to the respondents to gather the necessary data. Retrieval was personally done by the researcher.

Summary statistics such as frequency counts, percentages, cross tabulation and descriptive measures such as mean were generated using descriptive statistics.

Pearson Product Moment of Correlation was also used to find out the relationship of variables and the t-test was considered to test the null hypotheses.

RESULTS AND DISCUSSION

This section presents the profile of the teachers in terms of sex, age, academic rank, educational attainment, in-service trainings attended related to ICT and ICT literacy skills. The findings are presented in Table 1.

Table 1: Profile of the Teachers

Variables	f	%
Sex		
Male	16	53.33
Female	14	46.67
Total	**30**	**100**
Age		
51 years old and above	7	23.33
41-50 years old	3	10.0
31-40 years old	11	36.67
30 years old and below	9	30.0
Total	**30**	**100**
Academic Rank		
Professor	0	0
Associate Professor	3	10.0
Assistant Professor	6	20.0
Instructor	12	40.0
Part-Time Instructor	9	30.0
Total	**30**	**100**
Educational Attainment		
Ph.D./Ed.D.	2	6.67
MA with doctoral units	5	16.67
MA/MS	8	26.67
BS with MA units	8	26.67
BS Degree Completed	7	23.33
Total	**30**	**100**
In-service Trainings attended Related to ICT	**f**	**Rank**

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None	18	1
Institution	5	3
Regional	4	4
National	7	2
International	3	5

***Multiple Response**

ICT Literacy Skills	**WM**	**Interpretation**
1. Word Processing	3.83	Very good
2. Database Management	3.17	Good
3. Powerpoint Presentation	3.70	Very good
4. Spreadsheet Application	3.67	Very good
5. Graphical Presentations	3.13	Good
6. Podcasting	3.53	Very good
7. Net Meeting	3.10	Good
8. Blogging	3.47	Very good
9. Web Browsing	3.57	Very good
10. Social Networking	4.10	Very good
Average weighted mean	**3.53**	**Very good**

Sex. As shown in the table, more than one-half of the respondents were males with 53.33 percent while the 46.67 percent were females. Result reveals that there were more male respondents than their female counterpart.

Age. Results indicate that the age of the teacher-respondents ranged from 30 years old and below and 51 years old and above. More than one-half of the respondents whose age belonged in the bracket 31-40 years old with 11 or 36.67 percent and only 3 or 10 percent among the respondents aged from 41-50 years old. This implies that the teachers are still young and new in the service.

Academic rank. It can be gleaned that most of the respondents were in the position of Instructor with 12 or 40 percent while only 3 or 10 percent reached the position of Associate Professor. This implies that the teachers need to advance their academic qualifications to elevate their academic rank.

Educational attainment. As depicted in the table, most of the respondents 8 or 2.67 percent of them were masters and baccalaureate degree holders with masteral units respectively. Only 2 or 6.67 percent were doctoral degree holders. This implies that the teachers were not all masters' degree holder and should continue pursuing their graduate studies for professional growth.

In-service trainings attended related to ICT. The in-service trainings related to ICT are categorized into institutional, regional, national, and international. Among the 30 respondents, 18 of them have not attended trainings related to ICT. Some of the teachers also attended trainings in national level having a frequency of 7, institutional with 5, regional with 4 and international with 3 as the last rank. Results imply that more teachers have not given the opportunity to avail of and attend seminars/trainings related to ICT.

ICT literacy skills. As shown in the table, among the ICT literacy skills, social networking and word processing got the highest weighted mean of 4.10 and 3.83 respectively which describes as very good. Net meeting got the lowest weighted mean of 3.10 described as good. The average weighted mean of 3.53 described as very good. This implies that most of the teachers possessed the ICT literacy skills.

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Attitudes of the Teachers towards ICT

Table 2: Attitudes of the Teachers towards ICT

Attitudes Towards ICT	WM	Description
Using ICT to present a lesson increases students learning.	3.73	Agree
Knowing how to use ICT will not be helpful in my work as a teacher	2.27	Disagree
The use of ICT can't be used in organizing my work	2.97	Moderately agree
ICT can be used to create materials to enhance teacher's performance	3.67	Agree
Using ICT makes me an effective teacher	3.83	Agree
Using ICT gives us a great deal of personal satisfaction	3.80	Agree
Knowing how to use ICT is a challenge	3.77	Agree
ICT greatly affects our health	3.40	Moderately agree
I like ICT integration in my work as teacher	3.67	Agree
The use of ICT makes me feel stressed and exhausted	3.30	Moderately agree
ICT tools are better than traditional materials	3.70	Agree
I have a lot of self-confidence when it come to working with ICT	3.60	Agree
ICT Resources Are Very Expensive	3.63	Agree
ICT is applicable in my daily life	3.33	Moderately agree
I can't live life to the fullest without ICT	3.17	Moderately agree
Using ICT gives me satisfaction in teaching	3.70	Agree
Using ICT makes me efficient in teaching	3.43	Agree
The use of ICT can be addictive	3.90	Agree
The use of ICT teaching provides authentic learning	3.27	Moderately agree
The use ICT in teaching –learning makes me a globally competitive teacher	3.27	Moderately agree
Average weighted mean	**3.47**	**Moderately Agree**

The data presented in table 2 shows the attitudes of the teachers towards ICT. Among the 20 identified attitudes, "The use of ICT can be addictive" obtained the highest weighted mean of 3.90 described as agree. Meanwhile, "Knowing how to use ICT will not be helpful in my work as a teacher" got the lowest weighted mean of 2.97 described disagree. This shows that most teachers have positive attitudes in integrating ICT resources into classroom instruction.

Level of Adequacy of the ICT Resources of the University

Table 3: Level of Adequacy of the ICT Resources of the University

A. Hardware	WM	Description
Desktop computer	3.07	Moderately adequate
Laptop computer	3.47	Moderately adequate

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Net book	3.33	Moderately adequate
Tablets	3.27	Moderately adequate
Printer	3.50	Adequate
Head set	3.30	Moderately adequate
Digital cameras	3.43	Moderately adequate
Camcorders/ Video cam	3.50	Adequate
LCD Projector	3.63	Adequate
Television/ LCD Television	3.20	Moderately adequate
Flash drive/ External drive	3.53	Adequate
Speakers	3.40	Moderately adequate
CD's/ DVD's	3.33	Moderately adequate
Scanners	3.27	Moderately adequate
Telephone/ Mobile phone	3.20	Moderately adequate
Average weighted mean	**3.36**	**Moderately adequate**
B. Software		
Microsoft Operating System (Microsoft XP/ Vista)	3.27	Moderately adequate
Linux Operating System (Ubuntu/Edubuntu)	3.33	Moderately adequate
MS Word/ Writer	4.33	Very adequate
Ms Excel/ Calc	3.47	Moderately adequate
Ms PowerPoint/ Presentation	3.50	Adequate
Ms Publisher	3.77	Adequate
MS Access/ my SQL	3.60	Adequate
Adobe Photoshop	3.70	Adequate
Adobe Reader	3.73	Adequate
Windows Movie Maker & Player	3.57	Adequate
Nero Player w/ CD/ DVD burner	3.57	Adequate
Learning Essentials	2.83	Moderately adequate
Encarta Encyclopedia	3.17	Moderately adequate
Web Browsers (Internet Explorer/ Mozilla/ Google Chrome/ Safari)	3.90	Adequate
Online Resources/ Tools	3.67	Adequate
Average weighted mean	**3.57**	**Adequate**
C. Internet Connectivity		

DSL	3.23	Moderately adequate
Smart Bro/ Globe Tattoo	3.50	Adequate
Wi-Fi (Public)	3.03	Moderately adequate
Average weighted mean	**3.26**	**Moderately adequate**

The data in Table 3 illustrates that the level of adequacy of ICT resources in terms of hardware components were moderately adequate, having an average weighted mean of 3.36 while the software obtained an average weighted mean of 3.57 described as adequate and internet connectivity having an average weighted mean of 3.26 described as moderately adequate. This signifies that there are adequate ICT resources available in the university.

Extent of Utilization of ICT Resources in Instruction

Table 4: Extent of Utilization of ICT Resources in Instruction

Indicators	WM	Description
A. Enhancement of Course preparation		
1. Preparing course syllabus that includes teaching on the use of ICT, such as word processors, web browsers, email, blogs, wikis, and other emerging technologies.	3.93	Often used
2. Designing lesson plans that incorporate tutorial and drill and practices software, e-resources and e-content.	3.30	Sometimes used
3. Creating lessons that includes the use of presentation software.	3.87	Often used
4. Identify appropriate software for specified learning objectives or standards and analyzes these packages for accuracy and curriculum alignment.	3.39	Sometimes used
5. Creating lesson plan that include the use of ICT to supplement classroom teaching.	3.40	Sometimes used
6. Identifying or designing complex, real-world problems and structure them in a way that incorporates key subject matter concepts and serves as the basis of student projects.	3.27	Sometimes used
7. Designing an online unit plan that supports the understanding of key concepts and the development of related skills in the subject area.	2.90	Sometimes used
8. Developing performance-based rubrics that allow teachers to assess students' understanding of key subject matter concepts, skills, and processes.	2.83	Sometimes used
9. Designing units and classroom activities that integrate a range of ICT tools and devices to help students acquire the skills of reasoning, planning, reflective learning, knowledge building, and communication.	3.37	Sometimes used
10. Using ICT resources to participate in professional communities and shore and discuss best teaching practices.	3.17	Sometimes used
Average weighted mean	**3.34**	**Sometimes used**
B. Teaching-Learning Process		
1. Demonstrating a variety of software packages in the subject area (such a visualizations in science, data analysis packages in mathematics, role-play simulations in social studies, and references resources in language).	3.40	Sometimes used

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2.	Discussing and demonstrating the basic operation of various hardware technologies, such as desktop workstations, laptops, printers, scanners, and hand-held devices.	2.83	Sometimes used
3.	Discussing and demonstrating the basic tasks of word processors & how they are used in instruction.	3.07	Sometimes used
4.	Describing the internet and the World Wide Web, elaborating on their uses, and describing how a browser works and using a URL to access a website.	3.70	Often used
5.	Using networked record keeping software to take attendance, submit grades, and maintain student records.	2.80	Sometimes used
6.	Using common communication and collaboration technologies, such as text messaging, video conferencing, and web-based collaboration and social environments.	2.73	Sometimes used
7.	Integrating the use of a computer laboratory into ongoing teaching activities.	2.87	Sometimes used
8.	Implementing collaborative, project-based learning and classroom activities, while providing guidance to students in support of the successful completion of their projects and their deep understanding and key concepts.	3.87	Often used
9.	Operating various open-ended software packages appropriate to their subject matter area, such as visualization, data analysis, role-play simulations, and online references.	3.00	Sometimes used
10.	Helping students use ICT to acquire the skills of searching for, managing, analyzing, integrating, and to develop communications and collaboration skills.	2.77	Sometimes used
	Average weighted mean	**3.10**	**Sometimes used**
C.	**Enrichment activities**		
1.	Using presentation software and other digital media to enrich students learning.	3.40	Sometimes used
2.	Using of web blogs, online communication and collaboration environments to support their collaborative project work and learning beyond class hours.	3.83	Often used
3.	Using ICT resources to participate in live forums.	3.07	Sometimes used
4.	Using social networking sites in giving online assignments and quizzes.	3.70	Often used
5.	Creating online portfolios and reflection and their own learning through ICT applications.	2.80	Sometimes used
6.	Incorporating multimedia production, web production, and publishing technologies into their projects in ways that support their ongoing knowledge production and communication with other audiences.	2.73	Sometimes used
7.	Designing projects plans and activities that engage the students in collaborative problem solving, research, or artistic creation	2.87	Sometimes used
8.	Using ICT to access outside experts and learning communities.	3.87	Often used
9.	Using search engines, online database, and email to find people and resources for collaborative projects.	3.00	Sometimes used
10.	Using ICT to communicate and collaborative with other students, peers, parents, and the larger community in order to nurture students learning.	2.77	Sometimes used
	Average weighted mean	**3.10**	**Sometimes used**

Enhancement of course preparation. As revealed in the table, 3.93 weighted mean or described as often used utilized ICT resources for preparing syllabus while 2.83 described sometimes used utilized ICT resources for developing performance-based rubrics. The average weighted mean obtained 3.34 and described as sometimes used. Findings imply that some of the teachers still use traditional methods and materials for the course of preparation.
Teaching-learning process. Data relative to the weighted mean of utilization of ICT resources in teaching-learning process posted highest weighted mean of 3.87 which described as often used whom teachers utilized ICT resources in implementing collaborative, project-based learning and classroom activities. The average weighted mean of 3.10 described as sometimes used. Results imply that many of the teachers sometimes utilized ICT resources in teaching-learning process.

Enrichment activities. The data reveals that ICT resources were utilized in enrichment activities. The highest weighted mean of 3.87 was obtained and described as often used utilized ICT resources to access outside experts and learning communities and the lowest weighted mean of 2.73 was reached and described as sometimes used utilized ICT resources in incorporating multimedia production, web production and publishing technologies. The average weighted mean of 3.10 described as sometimes used. This implies that the teachers utilized ICT resources in enrichment activities and managing classroom activities.

Relationship of Variables

Table 5 Relationship Between the Profile of the Teacher-Respondents and the Extent of Utilization of ICT Resources in Instruction

Variables	r	CV	TV	Interpretation
Sex	0.73	1.85		
Age	0.75	1.97		
Academic rank	0.31	0.56	3.182	H_o Accepted
Educational attainment	0.59	1.27		Not Significant
In-service training	0.78	2.15		
ICT literacy skills	0.55	1.86	*2.306	

Alpha level of significance (α) = 0.05 df = 3 *df = 8

As shown in Table 5, the result shows the relationship between the profile of the teacher-respondents and the extent of utilization of ICT resources in instruction. The computed t-values were lesser than the table value of 3.182 and 2.306 at (α) = 0.05. The hypotheses were accepted or there is no significant relationship between the profile of the teacher-respondents and the extent of utilization of ICT resources. This means that the profile of the teachers does not affect the extent of utilization of ICT resources

Table 6 Relationship Between the Attitudes of the Teachers toward ICT and Extent of Utilization of ICT Resources in Instruction

Variables	r	CV	TV	Interpretation
Attitudes of the teachers towards ICT and extent of utilization of ICT resources	0.82	7.61	2.048	H_o Rejected Significant

Alpha level of significance (α) = 0.05 df = 28

As provided in the table, the attitudes of the teachers toward ICT resources and extent of utilization of ICT resource in instruction were significantly related having an (r=0.82), (cv=7.61) and (t-value= 2.048). Results reveal that the attitudes of the teachers toward ICT resources affect the extent of utilization of ICT resources in instruction. Thus, the hypothesis that there is no significant relationship between attitudes of the teachers toward ICT resources and extent of utilization of ICT resources in instruction was rejected and therefore significant.

ISSN: 2277-9655
Impact Factor: 3.785

Table 7 Relationship Between the Level of Adequacy and the Extent of Utilization by the Teachers of the ICT Resources in Instruction

Variables	r	CV	TV	Interpretation
Level of adequacy and the extent of utilization by the Teachers of the ICT resources	0.94	15.34	2.042	H_o Rejected Significant

Alpha level of significance (α) = 0.05 **df = 31**

The level of adequacy and extent of utilization by the teachers of the ICT resources were very high significantly related having an (r=0.94), (cv=15.34) and (t-value= 2.042). Results show that the level of adequacy of ICT resources affected the extent of utilization by the teachers of the ICT resources. It implies that the higher the level of adequacy, the more teachers utilized the ICT resources in instruction. Thus, the hypothesis that there is no significant relationship between the level of adequacy and extent of utilization by the teachers of the ICT resources was rejected and therefore significant.

Problems Encountered by the Teachers

Table 8: Problems Encountered by the Teachers in the Utilization of ICT Resources in Teaching

Problems	WM	Description
1. Inadequate computers for the number of faculty members.	3.20	Moderately felt problem
2. Operating systems has no license (Microsoft)	3.50	Much felt problem
3. Lack of ICT trainings for teachers.	3.77	Much felt problem
4. Large class size with limited computers.	3.17	Moderately felt problem
5. No internet connections.	3.93	Much felt problem
6. In-adequate ICT resources and maintenance.	3.03	Moderately felt problem
7. Computer manuals/guides are inadequate.	3.13	Moderately felt problem
8. Lack of support from administrators.	2.83	Moderately felt problem
9. Students' lack of interest in the use of ICT.	3.20	Moderately felt problem
10. There is no importance/value in using computers –learning process.	3.47	Moderately felt problem
Average weighted mean	**3.32**	**Moderately felt problem**

Among of the ten (10) identified problems in the utilization of ICT resources in teaching, a weighted mean range from 2.83 – 3.93, No Internet Connection was the much felt problem with a weighted mean of 3.93, followed by Lack of ICT Training for Teachers having a weighted mean of 3.77. Lack of Support from Administrators got the lowest weighted mean of 2.83 described moderately felt problems which means that the administration has full support to the needs of ICT resources in the University. The result shows that there are not so many problems encountered by the teachers in the utilization of ICT resources in teaching.

CONCLUSIONS

Most of the teachers are Instructors in their academic rank. Many of the teachers are inclined to obtain graduate degrees. Most of the teachers lack adequate trainings and seminars related to Information and Communication Technology. The teachers prefer to utilize the ICT resources in instruction among the BSIT students.nThe university has moderately adequate level of adequacy of the ICT resources. There is no significant relationship between the profile of the teacher-respondents and the extent of utilization of ICT resources. There is no significant relationship

between attitudes of the teachers toward ICT resources and extent of utilization of ICT resources in instruction There is no significant relationship between the level of adequacy and extent of utilization by the teachers of the ICT resources.

REFERENCES

[1] ICT Competency Standards For Teachers: Implementation Guidelines, (2008). Version 1.0 United Nations Educational, Scientific and Cultural Organization, place de Fontenoy, 75352 PARIS 07 SP, United Kingdom, UNESCO.
[2] Information and Communication Technologies in Teacher Education: A planning guide information and communication technologies in teacher education unesco, (2002). Division of Higher Education UNESCO, France.
[3] Carlson, Sam, "The Missing Link in Educational Technology: TRAINED TEACHERS'. TechKnowLogia, October – December 2002, Knowlegde Enterprise, Inc. Accessed 01/07/12/www.TechKnowLogia.org