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Effective Use of Information-Communication Technologies in Teaching and Learning in Secondary Schools in Nigeria Education System: Ebonyi State Example

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This paper discusses and summarizes research results of pedagogy using information and communication technology (ICT) effectiveness, as well as the influence of initial education of teachers on various components of their training in the use of new technologies. The research is focused on the main stages of the research process and models of teaching and learning that support access to and researching the development of teachers and provides illustrations of effective practice rich enough to encompass the complexity of choice. Teachers have to decide when, when not, and how to use ICT to strengthen their teaching in the information domain. Included in the results of the investigation are a series of examples illustrating effective use of ICT by teachers.

Keywords: ICT, Nigeria education system, teachers

Introduction

Global information society is developing at a higher rate. Globally speaking, the main task of automation of information-communication technologies is to improve conditions for gaining the knowledge of students and teachers to use computers.

Information and communication technologies have become an integral part of all aspects of life. In the last twenty years the use and application of ICT has fundamentally changed the practice and business in all areas of human activity. Within education, ICT began to have significance, but also the impact is still not as strong and intense as in other areas. In a world that is so rapidly developing, the role of ICT in education is becoming increasingly important. Education is an activity that required a quality that is traditionally associated with quality teachers.

It should be noted that ICT can make teaching more efficient and richer only if applied correctly and balanced, and if accepted without reservation and non-selective, and any form of implementation in education is interpreted as a positive method of teaching practice. It follows that the primary task of developing the competence of teachers to use ICT effectively to support teaching methods that support the overall development of students, is to activate them and provoke them with higher levels of thinking and learning, motivate them and encourage critical thinking and consider different options and styles of learning.

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The aim of this study and implementation of information-communication technologies lies not only in those applications in ICT matters, but also in teaching other subjects.

The problem is not in great anticipation of information technology in education, but lies in the fact that complete and excellent use of IT in organization of teaching requires fundamental changes, from the context of instruction and learning of any predmeta. It can be achieved only if we reform the education system.

In the field of education system, it is necessary to establish a part of basic education, which refers to the knowledge and skills of computer literacy and the use of ICT in teaching and learning. Future teachers would be able:

(1) to implemente educational projects in the areas of application in teaching and learning;

(2) to diagnose and evaluate knowledge using ICT;

(3) to shape the environment for learning appropriate developmental age of students (the competent use of ICT in education);

(4) to encourage independent learning;

(5) to evaluate and select educational software for different areas of knowledge;

(6) to continue self-improvement times longer.

Teaching and Learning Process of ICT

With the pedagogical and methodological aspects, in the center of learning and teaching the student, Figure 1 shows the didactic triangle, which clarifies the relationships of students, teachers, and curriculum.

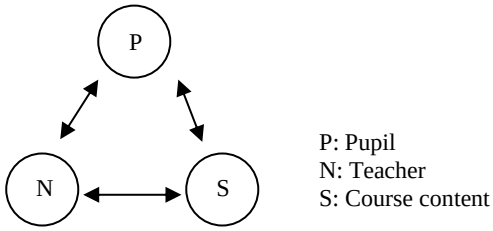

Figure 1. Didactic triangle: students, teachers, instructional content.

How this approach is viewed with a special view, and where the means of teaching and learning among other things take technology, get active didactic triangle (Figure 2). For the concept of a student here, we can replace the notion of man: people of different age limits can be educated; ICT is not limited to use only by one generation, but also be usable by all people.

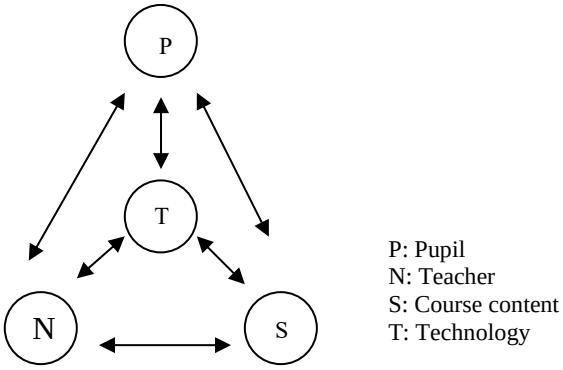

Figure 2. Active didactic triangle: the student, teacher, nastvani facilities and technology.

When the work of preparation for teaching and learning has an active role of modern technology, it is often forgotten or only partially meets the methodological and pedagogical side. Teachers who are planning the content and use of modern technology to implement them, are often intended to put in second place students in these facilities.

Information and communication technology has become an integral part of education to support teachers in the implementation of traditional instruction or as a substitute of such teaching with one of the new methods and modes of teaching process and learning process.

The new educational paradigm is oriented towards students (learner-center paradigm). The student is placed in the center, in the environment for learning resources, both in terms of time and places and ways of learning (Figure 3). The student is all-oriented and included an expression of learning resources (people, knowledge, technology, media, organizations, ...).

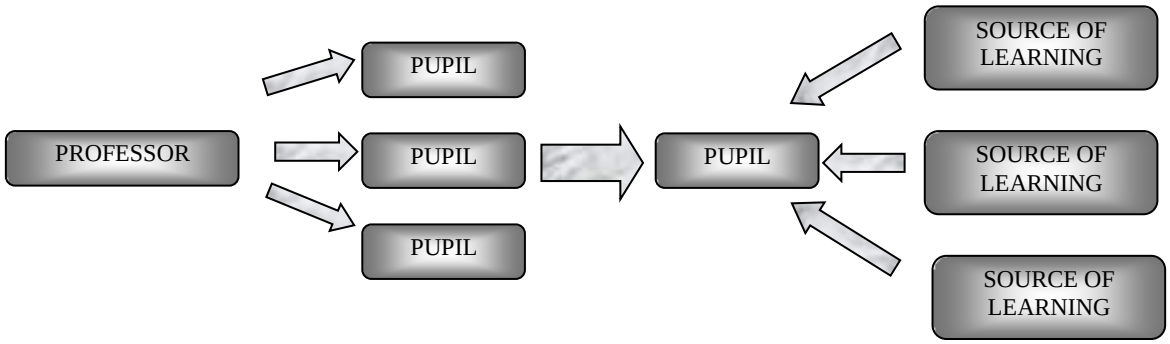

Figure 3. Crossing the traditional teaching paradigm to a new, advanced paradigm.

Traditional education is based on the educational paradigm called model reproduction of knowledge. The purpose of this study was transferred from the static knowledge sources (teachers) to the student, a passive recipient of such knowledge. Model reproduction of knowledge should be replaced with the construction of knowledge. This can be achieved only if teachers and students as partners are working together to build a knowledge base that should be adopted.

Professional Development and Progression of Replying-Teacher

The education system is under the influence of contemporary technology adapted to the demands of the information society. Schools are becoming more modern and attractive, and teachers continually develop professionally.

Vilotijevic (2008), opoine that the school as a peaceful and relatively closed oasis of knowledge must become an open research station in which young people acquire and constantly update knowledge. That students achieve better results, teachers are expected to continually revitalize the knowledge and skills.

The traditional approach in our country is still present, because the majority of teachers there still have fear of acceptance of innovations and feel safer and more ready by applying already proven methods, while a number of teachers' innovations have been established in practice. Most teachers have a moderate attitude towards innovation, implementing modern information and communication technologies in teaching process. The reasons for the resistance of teachers to innovate changes are due to profile, lack of newspapers, as well as obligations and responsibilities that are imposed by introducing changes.

Traditional approach is characterized by frontal obsolete work and usually a one-way communication between teachers and students. Students are not sufficiently activated in work and unable to progress individually in accordance with the knowledge and skills, which affects their motivation. The most common suggestions of teachers discussing the reform of education were the proposals for training in ICT in education and application in teaching which indicates the divided views in relation to application of ICT (Smith-Cerovic, 2004). Drucker says that most teachers spend much hours trying to correct things that are best to learn and not to surrender, because the subjects are best taught using computers and different programs (Djordjevic, 2001).

Therefore, it is necessary and a system of professional development for teachers, including: initial; service training, system monitoring and evaluation system of teachers, and professional development of teachers. The aim of the professional development of teachers is constantly developing teachers' potential for high-quality business and improving teaching. In order to develop teachers professionally, they should consider all the aspects of their profession, during training, internships, and continuously increase the awareness of the work (Bjekić, 2009). It is necessary to enable the teacher to apply the computer in teaching, to discover new possibilities for teaching and learning, and to develop based on its own strategy in the classes. Professional use of computer assisted learning qualitatively improves the teaching process, and improper use can have negative effects.

Analysis of UNESCO indicates that there is not enough in teaching of computer science and computer literacy. They believe that the use of computers can improve teaching, if applicable, at the right time, with adequate and acceptable content, and if it is designed with certain methodological techniques and procedures.

State of ICT in Schools in Ebonyi State School System

Case Studies

The research applied ICT among students and teachers, as well as the level of investment in the development of ICT in schools.

- Timing of research:
  During the first half year 2010/2011
- Defining the area of research:
  Secondary schools in Ebonyi State

Objectives of the Study

The aim of the Study is to investigate effective use of ICT in teaching and learning in secondary schools in Ebonyi state secondary school system. The idea of the study is to determine if the goal is properly defined, recognizable and hypotheses to be verified.

The study aims to determine the level of the presence of ICT in education, the ratio of teachers to introduce ICT as well as an adequate level of material investment of school management.

Research Hypothesis

The hypothesis is scientific assumption that scientific research must confirm or reject.

This case set the basic hypothesis.

In secondary schools, teaching computer science, but also in the teaching of other subjects, enough is not done in the application of scientific and technological development. Primena-wide information and communication

technologies, as well as the specific social needs are required or else, teachers in secondary schools will have no tendency to recently become more efficient and to monitor trends of scientific-technological revolution.

In the main and auxiliary hypotheses are the hypotheses:

(1) The content of teaching in education is not sufficiently monitoring the current techniques and technology;

(2) Classes are more based on theoretical knowledge and less on practical knowledge;

(3) Most students have a weaker contact with the information and communication and the technology.

Research Area

Research area of interest is secondary schools in Ebonyi state. The study sample is representative and it was attended by students of SS2 and SS3 levels, management of schools, and teachers, in a sample survey of eight secondary schools in Ebonyi state (Table 1).

Table 1

	School city	Place	Municipality	Area
1	Model SS	AI	Abakaliki	City
2	Girls SS	Ugwuechara	Abakaliki	City
3	Ezza high Sch.	Ezza south	Onueke	Rural
4	Urban sec. Sch.	Ndufu Echara	Ikwo	Rural
5	Girl Sec. Sch.	Agubia	Ikwo	Rural
6	Gov. SS	Afikpo	Afikpo	Rural
7	Ozizza CSS	Ozizza	Afikpo	Rural
8	Unity SS	Ozizza	Afikpo	Rural

In Figure 4 you can see the number of surveyed urban and rural schools.

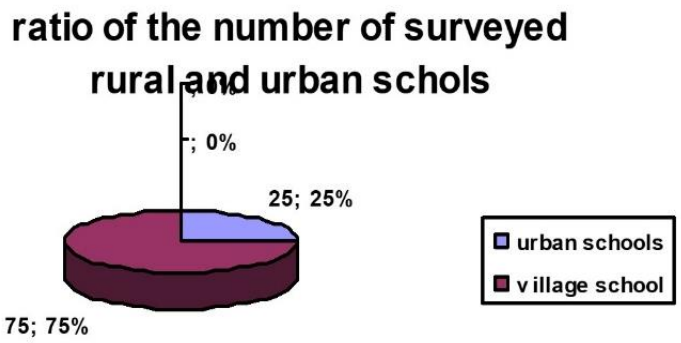

Figure 4. Ratio of the number of surveyed rural and urban schols.

Qualifications of teachers. One of the major carriers uses information and communication technology in secondary schools as teachers of information technology and engineering education. They are the ones who are expected to be the first holders of ICT activities. They are usually responsible for training other colleagues for the use of computers, and other technical devices. Their expertise and enthusiasm depends greatly on the use and application of fast infrared technology.

Therefore, we consider (Figure 5) the structure of teachers who teach computer science.

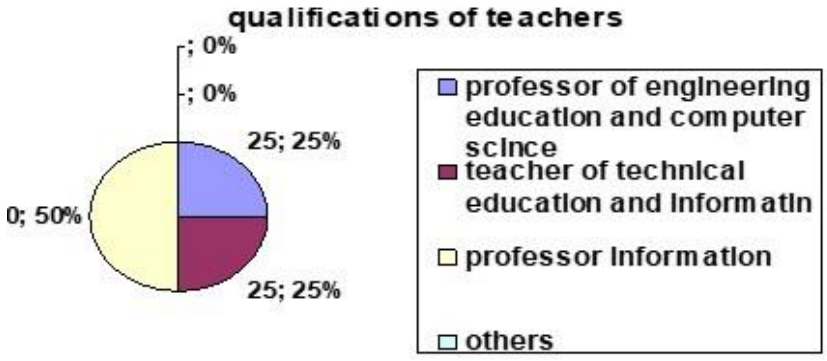

Figure 5. Qualifications of teachers.

Teachers who were interviewed were the first teachers of technical education and computer science, with the doctorate degree in computer science and masters degrees of engineering education and computer science.

Teachers of technical education and computer science: 25%—higher level of education;

Teachers of technical education and computer science: 25%—secondary school teachers; 50%—university degree.

The question of training. Professional development should be based on the needs and interests of teachers. It is important to motivate teachers in professional development, and the specificity of calls and deal in the field should be continuous and ongoing professional development. If the first IT teachers have ceased to be trained in simple terms they will fall off the track. Technology development of new hardware and software is so far left that it is almost impossible to track. Interviewed teachers declared (Figure 6) to attend seminars, but when you declare the same, most of them make comments that do not follow the development of technology and the current situation in the State, country, and especially in the world.

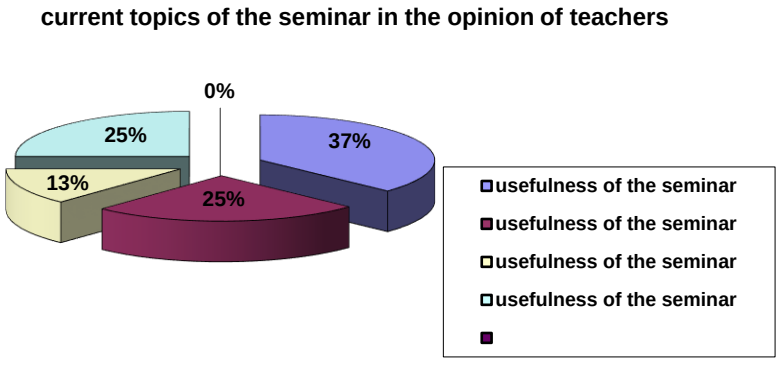

Figure 6. Current topics of the seminar in the opinion of teachers.

From Figure 6, it can be seen that: Usefulness of 50%: three teachers (37%); Usefulness of 60%: two teachers (25%); Usefulness of 70%: one teacher (13%); Usefulness of 80%: two teachers (25%).

On the basis of the data collected, it was concluded that professional development programs enhance the existing knowledge, skills, and abilities of teachers. Teachers are beginning to actively monitor the new educational technology and to apply them in their work, become better prepared and more competent for self-evaluation process and promoting the profession.

Conclusion

Information and communication technology is nowadays often used to enable each student individually appropriate computer and access to easy learning. The initiative comes to limelight with application of ICT for learning and for a comprehensive change in teaching and learning. It is necessary to orient teachers to the need for inspiration and updated knowledge in certain areas.

Recommendations

Based on the discussions, the following recommendations are made:

The recommendation is subject to different ways suitable for the exchange of knowledge in practice so that all students confidently and creatively use ICT to help develop the skills and knowledge to achieve goals.

They should be development of ICT as it has created the pre-change which is considered to be the position of teachers and students.

The teaching process has become unthinkable without a PC. Focus of the teacher moves from the realization of the preparation of teaching.

Students should become more active and independent in their work, and teachers as producers of knowledge, should organize their work, motivate, and encourage students.

In schools all students are equal, but students' should be encouraged to develop the ability to read and write, so that the tasks will be easily achieved. Schools should be given hands to acquire changes in technology, society, and culture, to be capable of daily change and adaptation.

The integration of ICT into the teaching process entails the issue of teacher competence. To train and improve vocational teachers and prepare them for lifelong learning (Life Long Learning), monitoring trends and frequent changes in information and communication techno-logy is an essential process that can not be avoided.

In secondary schools, teaching computer science, should also be introduced in the teaching of other subjects, and monitored sufficiently.

References

Bjekić, D. (1999). The professional development of teachers. In R. J. Simons, J. van der Linden, & T. Duffy (eds.), *New learning*. Dordrecht: Springer.

Djordjevic, C.. (2001). Approach to teaching methodologies. Abakaliki: Bolton Publishers Ltd.

Mandic, D., & Ristic, M. (2005). *Information technologies.* Belgrade: Mediagraf.

Mandic, D., Brankovic, D., & Ristic, M. (2003). *Methods of IT education with basic information.* Belgrade: Mediagraf.

Ninkovic, B. (2005). Contemporary obrayovna technologies and capabilities teachers and modern educational technology. In *Proceedings no. 3 technology, computer science, education*, Belgrade, Institute for Educational Research.

Smith, C. (2004). *Information technology.* Zrenjanin: Technical University "Mihajlo Pupin".

Vilotijevic, M. (2008). Critical theory and critical pedagogy and diaspora. In: Ilan Gur-zeev (Ed.). Critical Theory and Critical Pedagogy Today. Haifa: University of Haifa p26

Željko, M. (2009). *Pedagogical-methodological manual for the practical work of prospective teachers of technical infromatičkog areas.* Practicum, Cacak: Technical Faculty.