

Teaching and Learning Process of the Information and Communication Technology and Computer Science Subjects in Lower Secondary Schools in Albania in Front of International Facts and Trends

Genci Berati

Alpen-Adria Universität Klagenfurt (AAU), Faculty of Technical Sciences, Institute of Informatics Systems, Klagenfurt, Austria

Keywords: The Curriculum Policy, Curriculum Design/Development, Educational Change, Curriculum Implementation, Professional Development, School Development, Textbook Development.

Abstract: The specifics and the broad content of the Information and Communication Technology (ICT) and Computer Science (CS) subjects dictate various problematic on the process of teaching and learning. In the large set of components that affect the process, one of the most important components is the methodology used in teaching and learning. In the teaching process of ICT and CS subjects the use of different methods for different issues is inevitable. Today the ICT and CS subjects are taught and learned based on various methods. Some of them are unsuitable for successful teaching-learning whereas others may bring success in certain learner's groups (lower secondary school). Didactic of Informatics is not yet internationally consolidated and still is a matter of discussions. The subject of this paper is mostly the actual situation of Albania and partially how to improve the process of teaching ICT in lower secondary schools. Herewith are taken in the analyses the ratios regards to the methodology, content and technology in best performing countries, also the key factors of their success.

1 INTRODUCTION

In our age, Computer Science (CS), Information Technology (IT) and Information and Communication Technology (ICT) are developing so fast. Nowadays there are modern and new prospective about Information and Communication Technology skills.

Every civil society in worldwide needs more and more Computer Literate, Technology Literate and Digital Literate persons. ICT specialists, Advanced Computer Users and Basic Computer Users are significantly increased during last years, but nevertheless the world wide labor market is still hungry for them.

Globally speaking, the ternary education is doing the most important part in preparation of the employer category that is mentioned above.

If we start before ternary education to introduce in a formal way creating ICT literate people, the results on quality and quantity terms will be much better.

In many countries the computer literacy is now subject of early stages of educational process. Even in some countries ICT literacy is formally introduced in preschool system.

In my country, Albania, ICT is a compulsory subject since grade 7 (age 14-15), according to national curricula of public schools.

The problems that I evidenced in the teaching and learning process were directed to many aspect of this process. Sometime the teaching process totally failed as sake of many factors such as; infrastructure, teaching sources and so on. However the main reason was the methodological failure. The teaching and learning process of ICT subjects is completely different from that of teaching other subjects (i. e. mathematics, physics or biology). This process is complex, difficult and problematic also in international level, but certainly there are also very good successful experiences in the teaching and learning process all around the world. Being focused in Methodologies, this paper will try to evidence those good experiences.

There are taken in account countries which are in top of the PISA List¹.

Albania has participated in PISA tests three times, in 2000, 2009 and 2012. The results of Albania are analyzed and compared in front those countries.

2 STATUS QUO OF ICT SUBJECTS

2.1 Albanian Educational System

The structure of the Albanian Educational System is briefly described here with its specifics and terminology. Elementary education is compulsory (grades 1-9), but most students continue at least until a secondary education. Students must successfully pass graduation exams at the end of the 9th grade and at the end of the 12th grade in order to continue their education. The literacy rate in Albania for the total population, age 9 or older, is about 93%. Most schools are public and financed through the government, but recently several private schools of various levels have been opened. There are about 5000 schools throughout the country. The academic year is divided into two semesters(terms). The structure of education is divided into these steps:

- Preschool education (Kindergarten): 1–4 years
- Primary education (9-year): 9 years (8 years prior to 2008)
- Secondary education:
 - Regular (middle or gymnasium or high school): 3 years
 - Vocational or Technical (technical, artistic): 2–5 years
 - Tertiary education:
 - Bachelor and Master Degrees (of 3 years and 1.5–2 years respectively)
 - Quaternary education (PhD, Doctoral Studies): 3 yearsii.

Formal ICT education in Albanian secondary schools includes grade 7, 8 and 9, respectively one separate subject in each grade, which is called “Informatics”.

As a lecturer of didactic of informatics in Shkodra University “Luigj Gurakuqi” (Albania), I participated in many secondary school classes in my city and assisted in many classes of ICT subject “informatics”.

2.2 Actual Facts about ICT Subjects

In order to scan the problematic of ICT subjects in Albanian secondary schools, last year I made a survey study during the first term of academic year 2012-2013, from September to October 2012. The survey is made in Shkodra district (one of the biggest district of Albania, in north-west Albania).

This survey can give a good overview regards to:

1. The actual situation of ICT infrastructure in secondary schools. (See subsection 2.4 for more details)
2. Teacher Background, Training, Distribution. (See subsection 2.5 for more details)
3. Curricula (Main Objectives) (See subsection 2.6 for more details)
4. Teaching Methodology (See subsection 2.7 for more details)

The survey is realized by contacting 85 secondary schools (90% of total schools in Shkodra district), by paying concrete visits on secondary schools in Shkodra district, interviews with directors(principals) of schools, telephone interview of directors of schools, interview of ICT teachers of schools. There are made also interviews to pupils of secondary schools.

E-mail reports from every school (ICT teachers or schools directors) are written.

2.3 Financial Facts

During 2012 the total budget for Ministry of Education in Albania was 38.905.136 USD. This amount represents 15.6% of the total budget. This budget was 2.79% of the total amount of the GDP. Finland (one of top level countries in PISA list) has 6% budget of total GDP for education purposes. (See figures 2.3.1 and 2.3.2).

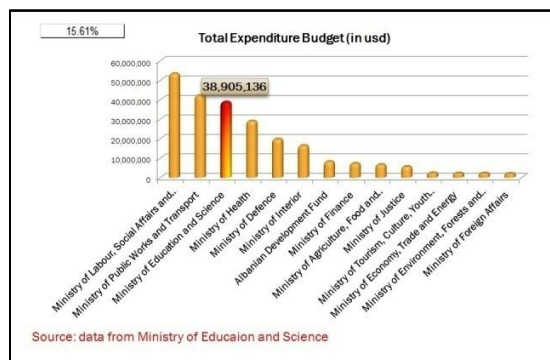


Figure 2.3.1: Education Budget of Albania in years.

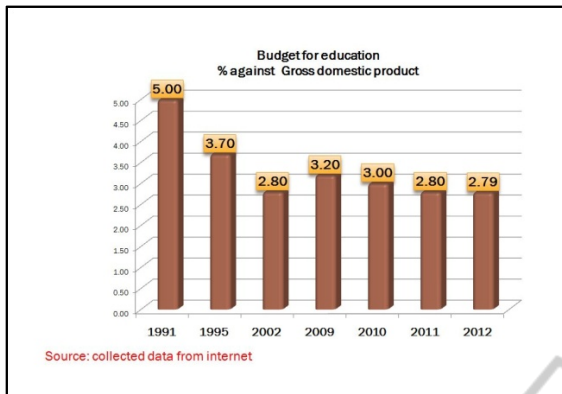


Figure 2.3.2: Education Budget in % against GDP.

2.4 Infrastructural Facts

Talking about infrastructure in Albanian secondary schools we will see below components like internet connection (see figure 2.4.1), number of computers per pupils (see figure 2.4.2), number of ICT laboratories per pupils and other equipment (see figure 2.4.3).

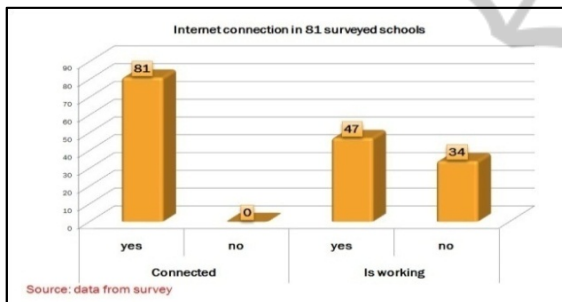


Figure 2.4.1: Internet connection in 63 schools in Shkodra district.

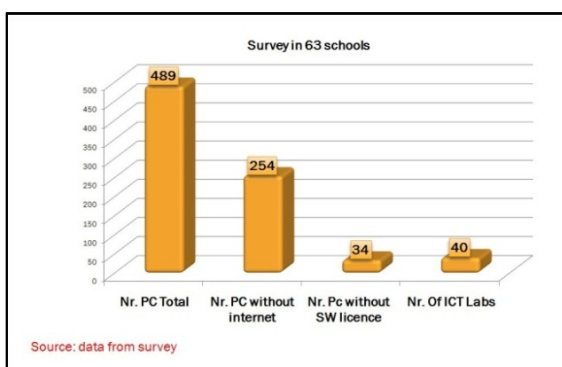


Figure 2.4.2: Total number of computers, computers connected to internet, missing licences and number of labs.

It is true that 100% of District schools have the internet infrastructure, but almost the half of it is not functional and the schools do not have capacities to maintain internet access. Even Local Office of Ministry (DAR) has no such capacities in regional level.

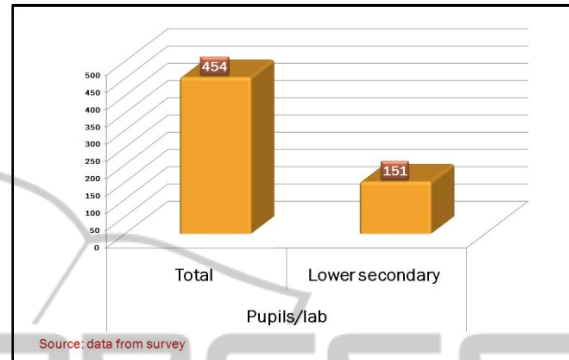


Figure 2.4.3: Number laboratories per pupils.

2.5 Teacher's Training

Talking about teacher training, it is evident that teachers have no training concerning didactic aspects. There is a need to break the cycle of learning by heart and passive learning activities. In Albanian secondary schools, It is strongly needed to move towards more learner-centered and interactive pedagogical approaches, concerning ICT subjects. The development and implementation of a comprehensive in-service training program for ICT teachers and school administrators is a necessity of the moment.

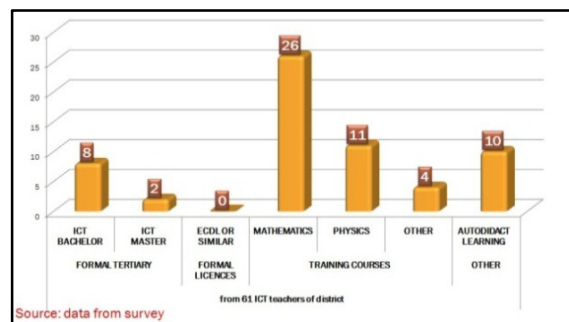


Figure 2.5.1: ICT teacher background in Albanian secondary schools.

2.6 Curricular Aspect

About aspects of curricula, the ICT is taught and learned as a separate subject. There is no application of ICT in Subject Areas. There is no presence of ICT across the Curriculum. The secondary school

curriculum does not reflect the ICT Specialization as an applied element to prepare pupils for a profession. In Basic literacy have significant missing contents such are database concepts, ethic and social issues and carriers in ICT.

2.7 Methodology

In Albania we have evidenced (based on the study survey mentioned above) the predominance of teacher-centered methods. Those methods were used in early pre-technology stages, also in international level, let's say 10-15 years ago. That is a rudiment of communism regime of Albania. Most of today teachers are educated under the strict methods dictated from regime structures. Most of ICT teachers are math teachers which did a ICT trainee, but the way that they teach math dictate also the way they teach ICT. The dominant method is so called ERR method (Evocation Realization Reflection).

3 TRADITIONAL-EARLIER TEACHING METHODS

Method represents how the content is transmitted to the pupil and how the class is organized.

Pre technical area of teaching in the teaching and learning process can be compared with the situation where the teacher is the sender or the source (of knowledge, concept ...), the study material is the information or message to send, and the student is the receiver of the information (Temechegn Engida, 2011). Regarded to ICT subjects, the content is much more unstable. The subject groups of teaching are not yet stable (different schools introduce ICT subjects in different grades, different countries have different ICT policies for schools). The teacher centred method can be successful method in other scientific subjects, but not in ICT and CS subjects.

The technology era dictated the new approach in teaching process everywhere. The technology is now an inevitable aspect of teaching and learning process. Source of knowledge is now a set of environments, tools and systems. As a result the learner can be an interactive subject of the process, not just the receiver of knowledge.

4 NEW APPROACHS AND METHODS

Nowadays there is a democratization of knowledge

and the role of the teacher is changing to that of facilitator (Damodharan and Rengarajan, 2000).

Based on experience of top countries in PISA list (PISA, 2009) (Finland, Canada, China etc.) and based on formal of UNESCO recommendations is made a list of new methods and approaches on how to organize the process of teaching in ICT and CS classes (Buettner et al., 2002; Grace et al., 2011).

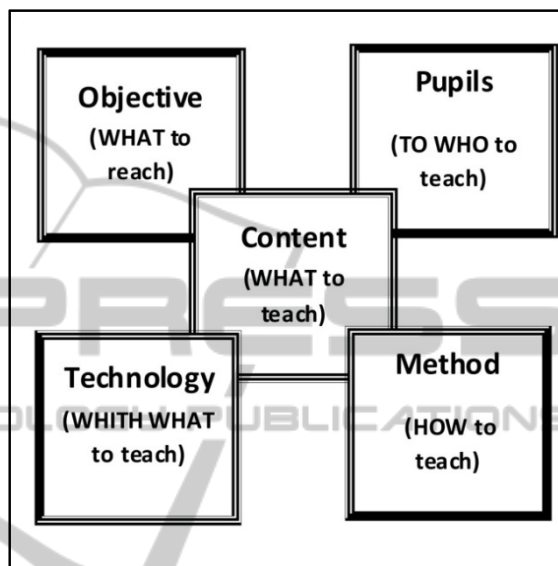


Figure 4.1: Components of teaching process.

| Issue | Teaching Unit | Methods |
|---------------------------------------|---------------|--|
| BASIC CONCEPTS OF ICT | 1 | Explanations with diagrams, video and real objects, and field trips where necessary. |
| USING THE COMPUTER AND MANAGING FILES | 2 | Student-centered activities, hands-on activities, on a guided basis for the system operation activities, and on a creative, self-exploratory basis for the production activities. |
| WORD PROCESSING | 3 | Student-centered, hands-on activities. Teachers may initially create simple exercises such as sample documents on disks, and require students first to open, modify and re-save files; then to progress to more difficult exercises such as the use of headers, footers, dictionary, thesaurus, spelling and grammar checkers. |
| WORKING WITH A SPREADSHEET | 4 | Demonstrations, student-centered, hands-on activities. |
| WORKING WITH A DATABASE | 5 | Student-centered, hands-on activities. A variety of examples of graphical representations illustrated. |
| COMPOSING GRAPHICAL (RE)PRESENTATIONS | 6 | Hands-on experience, searching for information, and using email. |
| COMPUTERS AND COMMUNICATION | 7 | Discussions; student-based research. |
| SOCIAL AND ETHICAL ISSUES | 8 | Visits to facilities having earlier and recent computer hardware. |
| JOBS AND / WITH ICT | 9 | This unit provides a good opportunity to send students or groups of students out to interview ICT practitioners or other people whose work is very much influenced by ICT, and to interpret the information gathered. The use of a word processor and a presentation tool should be appropriate to illustrate the results of such research. Qualification survey graphs could also be created. A spreadsheet could be used to list and compare variables, for example, investment in training versus potential income. |

Figure 4.2: Teaching methods suggested for each unit in Basic ICT literacy.

5 RESULTS

In this section we describe some general results.

This paper takes in evidence the real situation of the Information and Communication Technology and Computer Science subjects in Albanian secondary schools.

It is evidenced that the government structures have introduced efforts to improve the process, but there are aspect of process like methodologies and teacher training that is not done enough.

In aspects of infrastructure is evidenced the most important problem which is the Maintenance of everything created. In order to suggest the results to the Albanian Educational System and trying to standardize the process of teaching and learning is evidenced the best international experience (especially in terms of methodology).

Is evidenced the lack of trainee of teachers about didactic, technological and content aspects, in order to surpass the gaps in process of teaching.

6 CONCLUSIONS

All or almost all secondary schools have computer labs with Internet access; however the number of computers, the quality of the maintenance and the Internet bandwidth are not adequate to meet student demands for ICT and CS classes. There is a need to increase the number of PCs, labs and other equipment.

Methodology is the most problematic, deficient and outdated aspect in the process (Teo and Wong, 2000). In Albania almost nothing is done from didactic specialists and from responsible institutes. It is an emerge need to move towards pupils – centered methods and multiple methods of organizations of teaching process. As final conclusion this paper points out the need to standardize methodologies in the community of teachers in Albania and wider.

Based on experience of Finland we can say that the key of success is the formal education and informal training of on duty teachers, autonomy of schools on ICT priciest and the autonomy of ICT teachers. In Finland there is not a National Curricula about ICT subjects. Also England (Kargiban and Kaffash, 2012) decided to skip National ICT Curricula for secondary schools. Schools and teachers can decide regard to curricula and methodologies.

Strategic goals must unify vision to fully integrate ICT and SC in the secondary school system and clearly include measurable curricular/pedagogical goals and objectives.

REFERENCES

Temechegn Engida, 2011. *ICT-enhanced Teacher Development Model*. (Written document of United

Nations Educational, Sciatic and Cultural Organization.

Dr. Damodharan V. S. ACCA, AICWA and Mr. Rengarajan.V AICWA. 2000. *Innovaive Methods of Teaching Proceedings of the Annual International Conference on ICT education*.

Yvonne Buettner, Charles Duchteau, Catherine Fulford, Pieter Hogenbirk, Mike Kendall, Raymond Morel. 2002. *Information and Communication Technology in Education*. Division of Higher Education UNESCO 2002 Printed in France.

Grima Grace, Bezzina Christopher, Camilleri Raymond J. Caruana Horace, Fr Cilia David, Fr Mallia Charles, Micallef Joseph, Mizzi Bernie, Pace Paul, Sollars Valerie, Spiteri Sandro, Testa Mario and Ventura Frank. *The National Curriculum Framework 2011*. ISBN NO: 978-99957-0-034-8.

Teo, R. & Wong, A. (2000). Does Problem Based Learning Create A Better Student: A Refelection? Paper presented at the *2nd Asia Pacific Conference on Problem Based Learning: Education Across Disciplines*, December 4-7, 2000, Singapore.

Zohreh Abedi Kargiban. Hamid Reza Kaffash. DICT Curriculum in Secondary School: A Comparison of Information and Communication Technology in the Curriculum among England, America, Canada, China, India, and Malaysia Paper presented at the *International Journal of Computer Application*. issue2, volume 1 (February 2012). ISSN: 2250-1797.

Highlights from PISA 2009: Performance of U.S. 15-Year-Old Students in Reading, Mathematics, and Science Literacy in an International Context.

ⁱ This is a list of countries by student performance. The Programme for International Student Assessment (PISA) published a report on the performance of students across countries and in a couple of cases, cities. The report has recently included more countries outside of the OECD member countries. The 2009 report, the latest one, is used in this list and includes a more extensive report into the reading ability of students.

ⁱⁱ <http://en.wikipedia.org/wiki/EducationinAlbania>