

How to strength teacher's abilities for permanently using ICT in the teaching process?

Abstract

One of the priority conditions for school system development in the world last few years is the strategy of professional teacher's development. In this paper we present the theoretical expectation of teacher's professional development, the models of teacher's professional development, the competences which they must to have to work with child in this informatical society.

Also, we present the results from investigation in R.Macedonia, about teacher's abilities to use computer technology into the work with child in different secondary (gymnasium and training college) schools and what we must to do, to strengthening their abilities for permanently using ICT in the teaching process, what kind of training they need, necessary for their practical work, especially when all primary and secondary schools have new hardware from the campagne "Computer for every child", because the quality of teaching process is in direct dependence from the using of informatical-communication technology in it.

Key words: professional development, ICT, teacher's, competences

*"Teachers and educators around the world are in the confrontatation with the fact that the aim of pupil's odds enhancement – may be achievement on different way than before. This new way move the educators To see the teaching process like special activity rating for each teacher. It moves the teacher to understand teaching process like professional activity open for collective observing, study and enhancement. It moves teachers to recognizing and accepting their responsibility not only for its self but and for their practice. For getting away this road we must to open school doors, to evaluate themselves, to scrutinize his self practice like part of his professional responsibility."
(Hilbert, Gallimore and Stigler, 2003)*

The world of change is everywhere. In this world of change, in every area of human living, are placed many questions which we try to answer. And in the educational areas, like one of the key for successful society development is putting many questions which must to be answer. One of the key questions is the question about teacher professional development, question which is putting at the start of his/her preparing for this profession. In that direction, in this paper first, we will try to gave the answer about the question, what we understand below the concept professional teacher development (PTD).

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At literature we met much different definition about PTD.

According to Ganser, Filding and Schalock, (4,p.8) „professional development is build upon the conception according which professional development is understand like process of inspiration and fan placed by administration directed toward the change of professional evolution activities which are implement from the teacher, in different environment and condition which lead toward continuously changes and investigation.”

We determine for definition according which PTD understand everyday professional and personal teacher growing, longitudinal and continuation process which start at the preparing of this profession and exist to the end of all life, process which is realize on different ways, which understand qualifying with new knowledge, abilities, strategies,... in appropriate areas and qualifying for application of appropriate technology.”

Why PTD is important for us?

- Because it has significantly influence of the teachers relic and teachers practice;
- It has influence to the pupils, and influence to the educational reform implementation;
- It has influence on teacher connections like: strengthening team work and collaboration in the classroom, between schools on local, national level and broadly;
- It has influence of aim determination (concrete, realistic and changeable);
- It has influence on changes directed to the methods, forms and strategy in teaching process;
- It has influence to the position and role of subjective factors in teaching process.

Professional teacher development is more that training, it means that technology training may be just a part of PTD, which include workshops, following the seminars, reflection, observation and activity realization. Teachers take role like an instructor, who are put in this longitudinal process and lead them toward the methods, technique application, in their practice. PTD means use of many forms like: team planning, when teacher observed pupils and request feedback, and when the team of teachers observe video lectures and reflect and discuss about it.

R. Macedonia, like the other lands in the world is occupying with the pulley of globalization process and with the aggressive step from the technology and informatics revolution which determinate each segment of the society. Because the education have big influence for person development and have fundamental and strategic meaning for state, we accentuate the necessity of satisfying the standards for compatibility, contemporary and efficiently of educational practice. Because of that, each educational staff are placed in the

centre of the society striving for quality improving of the educational work and to elevate the efficiency of the educational institution.

The government in 21 Century must to promote using of ICT like a basic tool from the local side authorities or each citizen.

In this case, international societies and the other subject must to promote the local authorities in building the capacity for ICT using like a medium for local staff improving

The government in 21 Century is that who motivate the investigation for informatics society, including the innovative forms of connections, tuning of ICT infrastructure, tools and application which gave help into the entrance to all, especially to the groups with special needs.

Informatics society development and economy development is impossible without special people's qualification who must to have active participation especially in their using. Second, the quality of teaching process is in direct dependent from the informatics-communication technology application.

Direction for education development and the education aim which are in the function to support the informatics society are designate with National strategy for informatics society development, especially in the part of e-education, e-learning appointed in 2005 year.

The realization of anticipate aims in formal and non formal education are in direct condition from the degree of infrastructure equipment at the educational institutions. The flow projects surely will improve the infrastructure with the equipment, from the aspect of Hardware or Software or with Internet connection. In the aim realization in e-learning education, principal priority must be teacher professional education. In this process must to be involve each teacher, not just one who teach about technology, but each of them who must to use that technology at the educational process. This process must to be in coordination with technical equipment at the educational institution. For better coordination and assurance of appropriate quality first must to be defining the appropriate standards (European and home) for different teacher's profile. Because of their nature that measure are especially important in the primary and secondary education.

We live in the time when each citizen uses the utility from the computers and communication technology. Internet is the tool for communication for each person without the differences.

In that context we accentuate teacher's qualification in the secondary schools.

Exactly from that, we put the question for their initially education and for their professional development. Especially attention we dedicate to his initial program and his

didactical methodology physiognomy. Teachers work is based on two components: a) specialty - scientific and b) pedagogy, which mean, that, for successful teaching realization is needed specialty scientific knowledge of designated areas and pedagogical knowledge, abilities and skills.

Analogously of that, at secondary education we have three categories of teachers:

1. Teachers who are able to realize teacher activities for which they are prepare at the study process;
2. Teachers which complete the other non teachers faculty and with additionally education (aim pedagogy, psychology and methods), they acquire with low to realize teaching at specialty schools , teaching for special subjects:
3. Teachers who have accomplishment practical teaching (instructors). This category, educated looked, besides low frame, practically is not define.

It means that teachers in secondary schools have their basic education which is not in correlation with teacher's profession and its needs. Similar situation we have with the statement with teachers qualification for work at secondary specialist schools, about specialty subject .We have a practice to employ person with conclusiveness higher education faculty of economy, agricultural faculty, ..., but without appropriate pedagogical prepare. They have low obligation to take pedagogical, methodical and psychological education, to work like teacher. For this teacher pedagogical education is realize at Faculty of philosophy (institute for pedagogy, and the other Faculty of pedagogy in Macedonia), more formal education not entity. Much important is how to take formal certificate, than professional knowledge, abilities and skills, necessary for successfully accomplishment the teachers function. With this way of professional qualification it's hard to expect revival of the educational process which acquire motivated, initially and creative teacher. Last experiences demonstrate that teachers professional development have many shortage like: deficiency of establishment policy for teacher professional development, leave to chance to individual initiative, insufficient material support at school for teacher professional development, formality of mentoring system of improver, deficiency of standards and criteria for professional development and progression in career; deficiency of initiative for professional teacher development; no define system for training, non building system of accreditation.

The Ministry of education and science will accept the following measures in the next period:

1. Evaluation and accomplishment the programs for teachers training and trainers training (specialization, basic pedagogy competences, competence for using

educational technology, especially ICT like key characteristic of teachers professionalism in education and understand like pedagogy potential and possibility for her integration in strategy for learning and work organization, organizational competences and abilities for team work, flexibility and opening).

2. Creating efficiently specialize and institutional support of the educational system and teacher and trainer improvement;
3. Providing a condition for profession acquirement in dependence from educational level;
4. Providing a condition for teacher's career advancement;

What we do about IT teacher competences in our schools?

The moment condition of the employment teachers in the schools, in the ratio with their abilities for ICT using in the educational work, is subsequent:

1. Teachers who in the flow of their basic education generally not acquire with knowledge necessary for ICT application, but not and in the flow of their further professional development;

2. Teachers who in the flow of their basic education, generally not acquire with knowledge necessary for ICT application, but in the flow of their continuing education through curses, seminars, acquire some knowledge necessarily to use ICT in education process;

3. Teachers who in the flow of their basic education acquire necessarily knowledge for ICT application (that are the teachers who finished their studies upon study programs in which have subject with informatics contents, last few years);

According that, we must to intervene in basic teacher training; but also in the professional teacher improvement, in sense of rising in or enrichment content, which will gave opportunities to teachers for successfully ICT application.

Especially today, when in R. Macedonia is actual the champagne "Computer for every child" initiate from our Government. Analogue of that, every school take equipment Software and hardware, from Government for every child at the school. So, teachers are placed in situation to realize lessons with using this technology. For that they must to have knowledge to use it, and to have succesfull results in the teaching process. For ICT using many of them acquire necessarily knowledge, but are that knowledge enough for ICT application and for succesfull and effectiveness teaching process. This is the problem not just for the primary schools and his teachers but and for secondary schools and teachers there.

Because of that, we realize this investigation in gymnasium and training college to see the real situation and to accent teacher's problems and their real requirement for their professional training and for successfully ICT application in the teaching process.

In that context in this work we will present facts gathered from the exploring which was realized with the teachers in secondary schools (gymnasium and specialize/training college) in R. Macedonia.

The purpose of this exploring was to establish the condition and check the teachers opinions and ideas about their professional development.

Needs of permanent education from areas ICT at teachers in the secondary schools

Subject of research

The subject of this research are teachers abilities and competences at secondary schools (gymnasium and training college) for ICT application in the teaching process in the accordance with tendency for the informatics society development..

Purpose of research is to get data for teacher's ideas and opinions for teacher's competences necessary for ICT application in the teaching process and for their needs for further education in this area.

Task of research

In accordance with this kind of goal are the next tasks:

1. To examine teachers ideas and opinions for their competences which they have and which are necessary and important for effectiveness teaching process;
2. To examine teachers ideas and opinions for their competences from ICT area necessary and important for effectiveness teaching process;
3. To examine the difference between ideas and opinions which have teachers in gymnasium and training college in correlation with their abilities and prepares for teaching process realization with ICT application;
4. To examine teachers ideas and opinions for their before training realization from ICT area;
5. To examine teachers needs for their next training in ICT application, necessary for ICT teaching realization;
6. To examine how, through which forms and who needs to organize and realize training for teachers cadre.

Hypothesis of research

Common/general hypothesis we assume that teachers from gymnasium and secondary specialize schools have permanent need of ICT training, necessary for teaching process realization with ICT application.

Subsidiary /Individual hypothesis

1. We assume that there are differences in opinions and ideas of teachers from gymnasium and secondary specialize schools about their abilities and preparing for teaching realization with ICT application;
2. We assume that each teachers have permanent need for permanent education and training in every area necessary for their professional development;
3. We assume that teachers have negative opinions and attitude for before training realization for ICT application in teaching process;

Methods, techniques and instruments of research

Descriptive-explicative method will be used. Inquiry with the instrument inquiry list composed of 12 questions by open and closed type.

Population and exemplar

Sample is suitable, stratificated, made of units of population which are free use to the explorer. It has 104 respondents, 55 from gymnasium and 50 from secondary specialize schools/training College, from Skopje, Bitola, Stip, Sv. Nikole, Kocani.

Processing data

Processing data is done with using %, Hi-square test, as a usage of qualitative-INTERIM analysis.

Analysis and interpretation of results

Interpretation of results in this research will be presented in order by groups of questions as they were shown in the inquiry list.

Results from the question mark for teachers in gymnasium and secondary scientific schools

Here are the results from the examined population of educators in preparing year.

We took in foresight also the number and sex of the teachers in gymnasium and training college (*table number 1.*)

	Examinees	Sex	
		M	F

Gymnasium	54	22	32
Secondary scientific schools	50	20	30

As we can see from the disposed table **number 1.** above,we can come to a conclusion that there are more females included in the teacher's profession in gymnasium and in secondary specialize/training college schools.

Question number 2. How long is your work experience with the pupils in secondary education?

Table num. 2

Choice	f	%
1-5 year	/	0
5-10	26	25
10-20	54	51.92
20-30	22	21.15
30-35	2	1.93
Total	104	100

Table results shows that 51.92% teachers from gymnasium and secondary specialize schools are with 10-20 years work experience. That talk to us that at schools we have teachers who have good teaching experience and they are in years when they may to learn more from different areas and to take new abilities for using ICT at the educational process.

Question num .3. Education and professional teacher education is the key question for each country. According to you, how much our educational system take care for his teachers after their graduation?

Table num.3

Choice	F	%
Many	22	21.15
Enough	26	25
Not enough	42	40.38
Doesn't care at all	10	9.62
I don't know	4	3.85

Total	104	100
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Table results shows that 40.38% teachers think that our educational system, our country not enough take care for the cadre after graduation, just with organize some workshops, following the seminars, reflection, observation and activity realization.

Question num. 4. From the list of competences present bellow with using a scale from 1 to 3, determine which competences you have and which are necessary for teaching process realization?

Table num. 4. Answers from teachers from Gymnasium

Common (generic) teacher's competences in secondary education.	1		2		3	
1. Abilities for communication, colaboration and team work.	4	7.4 1%	2	3.70 %	48	88.8 9%
2. Syntetical, analitical and critical thinking and problem solving	4	7.4 1%	2	3.70	48	88.8 9 %
3. Flexibile knowledge using in practice.	4	7.4 1	3	5.56	47	87.0 3
4. Self activities, selfcriticism, self evaluation and fighting for quality	3	5.5 6	5	9.26	46	85.1 8
5. Coommon knowledge, abilities for communication with expert for other scientific areas	3	5.5 6	8	14.8 1	43	79.6 3
6. Permanent education, ambiciously, and specialize improving	4	7.4 1	2	3.70	48	88.8 9

7. Organizational and menadger abilities	4	7.4 1	3	5.56	47	87.0 3
8. Abilities for time managing, for self preparing and planing, selfcontrol	1	1.8 5	25	46.3	28	51.8 5
9. Communication with using foreign language.	1	1.8 5	25	46.3	26	48.1 5
10. Empathy and opening for the other person and their social situation	1	1.8 5	38	70.3 7	15	27.7 8
11. Knowing and undersytanding differents between people,the characteristics of their developmene and people's needs	2	3.7 0	24	44.4 4	28	51.8 5
12. Acquiring knowledge about educational concept, their philosophy and history base	3	5.5 6	24	44.4 4	27	50
Preparing for inverstigation in secondary schools	2	3.7	25	46.3	27	50
13. Organizational and managing abilities in education, mentoring	2	3.7	6	11.1 1	46	85.1 8
14. Abilities for understanding the multicultural differences.	1	1.8 5	6	11.1 1	47	87.0 3
Particular (special) teachers competences in secondary education	1		2		3	
	f	%				
15. Knowing the contents and methods of concrete educational area.	2	3.7	8	14.8	44	81.4 8
16. Understanding and using the programs theory and common and didactical knowledge from the subject area.	4	7.4 1	6	11.1 1	44	81.4 8
17. Interdisciplinary corelation between different subject contents	2	3.7	8	14.8 1	44	81.4 8
18. Using special pedagogy knowledge for work with child with special needs.	5	9.2 6	2	3.7	47	87.0 3
19. Pedagogical leads of the group.	8	14. 81	36		10	18.5 2

20. Collaboration with parents	4	7.4 1	2	3.7	48	88.8 9
21. Understanding the relation between educational institution and social environment- sistematical looking and work	4	7.4 1	3	5.56	47	87.0 3
22. Abilities for personal and group evaluation, their excellent and poor areas with appropriate methods, techniques and instruments	1	1.8 5	25	46.3	28	51.8 5
23. Possibilities for reestablishment of partners relation with the other users (local community,...)	1	1.8 5	25	46.3	26	48.1 5

Table num. 5 Answers of teachers who educated at the secondary specialized schools

Common (generic) teacher's competences in secondary education.	1		2		3	
1. Abilities for communication, colaboration and team work.	4	8%	3	6%	43	86%
2. Syntetical, analitical and critical thinking and problem solving	4	8%	4	8%	42	84%
3. Flexibile knowledge using in practice.	4	8%	3	6%	43	86%
4. Self activities, selfcriticism, self evaluation and fighting for quality	3	6%	5	10%	42	84%
5. Coommon knowledge, abilities for communication with expert for other scientific areas	4	8%	7	14%	39	78%
6. Permanent education, ambiciously, and specialize improving	5	10 %	3	6%	42	84%
7. Organizational and menadger abilities	6	12 %	6	12%	38	76%
8. Abilities for time managing, for self preparing and planing, selfcontrol	2	4%	24	48%	24	48%

9. Communication with using foreign language.	2	4%	24	48%	24	48%
10. Empathy and opening for the other person and their social situation	2	4%	37	74%	11	22%
11. Knowing and undersytanding differents between people,the characteristics of their developmene and people's needs	4	8%	22	54%	24	48%
12. Acquiring knowledge about educational concept, their philosophy and history base	3	6%	28	56%	19	38%
13. Preparing for inverstigation in secondary schools	3	6%	25	50%	22	44%
14. Organizational and managing abilities in education, mentoring	6	12%	6	12%	38	76%
15. Abilities for understanding the multicultural differences.	7	14%	6	12%	37	74%
Particular (special) teachers competences in secondary education	1		2		3	
16. Knowing the contents and methods of concrete educational area.	4	8%	10	20	36	72%
17. Understanding and using the programs theory and common and didactical knowledge from the subject area.	6	12	8	16	36	62%
18. Interdisciplinary corelation between different subject contents	5	10	8	16	37	74%
19. Using special pedagogy knowledge for work with child with special needs.	5	10	2	4%	43	86%
20. Pedagogical leads of the group.	8	16	34	68%	8	16%
21. Collaboration with parents	6	12	3	6	41	82%
22. Understanding the relation between educational institution and social environment- sistematical loking and work	4	8%	3	6	43	86%

23. Abilities for personal and group evaluation, their excellent and poor areas with appropriate methods, techniques and instruments	3	6	22	44	25	50%
24. Possibilities for reestablishment of partners relation with the other users (local community,...)	4	8%	25	50%	21	42%

According to the answers from both groups of examinees we conclude that the common/generic competences like: Abilities for communication, colaboration and team work, Syntetical, analitical and critical thinking ad problem solving, Flexibile knowledge using in practice, Self activities, selfcriticism, self evaluation and fighting for quality, Common knowledge, Abilities for communication with expert for other scientific areas, Permanent education, ambiciously, and specialize improving, Abilities for time managing, for self preparing and planing, selfcontrol, take the biggest percent from the presented common competences.

Particular sompetences which are important for both group are: Knowing the contents and methods of concrete educational area; Understanding and using the programs theory and common and didactical knowledge from the subject area, Interdisciplinary corelation between different subject contents, Using special pedagogy knowledge for work with child with special needs, Pedagogical leads of the group. Collaboration with parents Understanding the relation between educational institution and social environment- sistematical loking and work.

Question num.5. According to you, which competences from ICT area are necessary for teaching process realization with ICT application?

Table num. 6. Answers of teachers from gymnasium

Teacher's answer	Yes/f	%	No/f	%	Total
Knowing Informatics language	52	96.3	2	3.7	54
Knowledge about Informatics programs	51	94.44	3	5.56	54
Abilities for internet communication	54	100	0	0	54
Knowledge about networks	10	18.52	44	81.48	54

Knowing methods for ICT application	54	100	0	0	54
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Table num.7. Answers from teachers who educated at secondary scientific schools

Teacher's answer	Yes/f	%	No/f	%	Total
Knowing Informatics language	42	84	8	16	50
Knowledge about Informatics programs	50	100	0	0	50
Abilities for internet communication	50	100	0	0	50
Knowledge about networks	15	30	35	70	50
Knowing methods for ICT application	50	100	0	0	50

As we can see from the presented data there are same differences in opinion between teachers from gymnasium and teachers who educated at secondary specialize/training college schools Teachers from gymnasium and teachers who educated at secondary specialized/training college schools gave 100% to two competences important for ICT application in teaching process like: abilities for internet communication and knowing methods for ICT application. For teachers who educated at training college important is also knowledge about informatics programs...

Question num. 6. According to you, do the actual material-technical conditions for work are enough for teaching process realization with ICT application, and with harmony with new requirement for teaching process realization?

Table num. 8 Answers from both examine groups

Choice	f	%
Yes	82	78.85
No	22	21.15
Total	104	100

Table results shows that 78.85% from the examinees think that actual material-technical conditions for work are enough for teaching process realization with ICT application.

Question num.9. How and in which forms are realized you're before training for ICT application in the teaching process?

Table num.9 Answer from both kind of teachers

choice	f	%
Formal	75	72.12
Informality	16	15.38
Informal	13	12.50
Total	104	100

The presented data shows that before training for ICT application was realized formally. Training before is consist by workshops, seminars, round table etc. in which are include not all but some teachers/

Question num.8 Do you think that your education about ICT is enough for you for your effective and successful e-learning implementation?

Table num.10 Answersof teachers from both kinds of schools

Choice	f	%
Yes	21	20.19
No	83	79.81
Total	104	100

Presented facts are showing that this two kind of teachers think that education about ICT application is not enough for effective and successful e-learning implementation.

Question num.9 According to you who should to realize that training?

Table num.11 Answers of teachers from two kinds of schools

Choice	F	%
Faculty for informatics science	13	12.5
Schools (tutor)	10	9.62
Center for CT	71	68.27
Employment agencies	1	0.96
Self education	9	8.65
Total	104	100

Presented facts are showing that the centre's for computer education are institutions who have to realize education about ICT application at the teaching process.

Question num. 10 What from the area of informatic technology, important for lesson realization, from your subject, you will need?

Teachers from gymnasium stressing that they need this knowledge: Power Point, to acquire abilities about WEB software, PHP, to know how to use whiteboard, knowledge about active methods in ICT applications

Teachers who educated at training college stressing that they need this knowledge? Linux (ubuntu), web-software, PHP, math software, teaching programs for all subjects and software for all subject contents, books in electronic version.

Question num. 11 According to you, do IT have big and important role not just for you, but for each teacher, for yours professional development?

Table num. 12.

Choice	f	%
Yes	25	24.04
No	79	75.96
Total	104	100

Presented results show that IT have big and important role in their professional development.

Question num. 12 Your suggestion and purpose for next education in this area?

All kind of teachers, from different secondary schools suggest that their further education in this field which contains education for using new programs like ubuntu applicative programs, to include all teachers, network connecting for all computers at schools, software for all learn subject at school, west oriented standards at computer programming.,organized more and more training for all teachers.

Reasoning perception

The analysis of the teorethical discussions of this problem as the empiric data to which we came in the exploring using techniques as: analyzing pedagogy documents, inquiry, and participative observing, direct contact with the participants in the examine are leading us to the next facts:

1. The questions that were asked previously, in the introduction, during the examine,had found their answer in the theorethical discussion and in the data as a result of the examine.

2. The conclusions in this examine should not be accepted as categorical because they refer to a concrete example, in actual time. Meanwhile the same should be regarded in a direction of finding approachable ways of realizing lifelong education.
3. Teachers from gymnasium and secondary scientific schools have permanent need of ICT training necessary for teaching process realization with ICT application.
4. There aren't differences in opinions and ideas of teachers from gymnasium and secondary scientific schools about their abilities and preparing for teaching realization with ICT application;
5. Each teachers have permanent need for permanent education and training in every area necessary for their professional development;

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