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Research on Using Internet Workshops in Education

Abstract

The work presents results of the empirical research on the universal implementation of computers to the Polish school in the framework of "Internet for small countries" and "Internet for High School students".

Key words*: Internet in education, internet workshops, model of organization, didactic solutions, educational reforms.*

Introduction

The aim of implementing, since 1998, the computerization scheme in Polish schools is approaching the European standards by Poland. Consequently, 25,000 computers connected to the Internet have been installed in 2,500 borough schools and the same number in junior high schools. In general, over 68,000 computers have been installed in Polish schools.

This unprecedented, on the European scale, phenomenon of mass implementing of information technology into schools in a short period of time, was the subject of research whose results are presented in this article. The aim was to show the validity of decisions and to evaluate the way they were implemented, all the more so as understanding the social phenomena and processes occurring in school environment will have a huge impact on effectiveness of using such a big number of internet workshops. Research contributed to diagnosing the status quo in the domain of the computerization of schools, discovering phenomena and processes present in mass introduction of internet workshops in education. It should be emphasized that the scheme of mass implementing of computers into schools, unique in Europe and having no verified models, required additional inquiries, which were made during empirical research. These findings provided empirical

evidence on the basis of which one might measure the effectiveness of the scheme and predict its long-term results. Empirical evidence is the source of information for reformed school. One should remember that mass introduction of computer workshops is being implemented together with the school reform. The research was carried out during changes of the system and according to new socio-economic conditions and the European Union standards. Understanding the above-mentioned processes and changes has got a wider meaning, since it provides empirical evidence, which determines the role of information technology in approaching the level of informative society by post-communist ones. Regularity described in the research is significant in defining the role and place of internet workshops in the reformed education. The research answered the question whether modern information technology influences the changes of the way of thinking and acting in the highest rank of the local government, and how it influences them. The research proved, as well, what functions information technology education performs in local governments.

So far, there has been no precise research devoted to the evaluation of the influence of information technology introduced into Polish education. The results of random research presented in few publications, do not make it possible to make generalizations and draw conclusions for educational experience. That is because the scheme of mass equipping of Polish schools with internet workshops was introduced only two years ago. What is more, the problem of organization of schools, the function of the didactic and educational process is presented in Polish literature in a rudimentary way. Taking into account the difficulties in creating the basis for theoretical research (procedure, tools, etc.), introductory inquiry was carried out among 512 teachers taking part in workshops within the scheme "The Internet in Each Borough". The results of the discussion held during the I Conference: "Information Technology in Reforming Education", organized by the Department of Educational Technology of Nicolaus Copernicus University in Toruń, were also taken into consideration. They proved that the process happening in Poland is unique and cannot be compared to any other phenomena in the world.

Mass introduction of computers into schools is related to the programme of additional schooling of teachers and establishing funds for computing education for teachers in boroughs by local governments.

The major aims of the scheme:

1. Detailed evaluation of using internet workshops in Polish education.
2. Finding model organizational and didactic solutions in terms of using internet workshops for the needs of the educational reform.

In view of the research, a diagnosis of the scale and kinds of influences on organizational, educational and didactic changes of computers introduced into borough schools and junior high schools was made. The research made it possible:

- to determine the local governments' reasons for joining the projects: "The Internet for Each Borough" and "The Internet for Junior High Schools";
- to examine the process of preparing the school base and the way of qualifying teachers for taking part in different forms of additional schooling;
- to determine the local government's expectations towards internet workshops;
- to determine the cooperation between schools and local governments in relation to using internet workshops;
- to determine teachers', parents' and students' view about the role of internet workshops introduced into schools.

The second important aim of the research was an evaluation of the influence of internet workshops on the process of the educational reform, and indication of solutions for educational theory and practice in terms of effective usage of computers introduced into schools; indicating the actions modifying curricula in order to adjust them to the changes caused by the introduction of internet workshops.

The third aim was examining possibilities and describing limits of additional schooling and self-improvement of teachers in terms of using the Internet in schools. The result of this part of the research was establishing the aims of the project concerning general education of teachers in terms of using information technology in long-distance teaching. The research made it possible to work out substantial solutions and merits as far as schooling of teachers from areas located far from political-administrative centres, in particular from the country, is concerned.

The aims presented above will be fulfilled through solving the following research problems:

1. What influence does the mass introduction of computers into schools have on the organizational, educational and didactic changes in their everyday functioning; what are the limits of proper usage of internet workshops?
2. How are internet workshops used by the local government in the process of regional development; what are its expectations towards internet workshops?
3. What factors decide about qualifying teachers for additional schooling; how are their knowledge and skills used in practice?
4. How is information technology used in the process of the school reform? What changes should be introduced into management organization, and realization of the didactic process, and the process of evaluation? How are

teachers' skills, who are educated in IT, used in the process of introducing the school reform?
5. What is the influence of internet workshops on the level of information technology teaching in primary schools and junior high schools?
6. What is the influence of internet workshops on the level of other subjects teaching?
7. How are the supplies of the computer nets used by schools in the implementation of the reformed curriculum?
8. How does the free access to the Internet influence the syllabus of information technology and other subjects in primary schools and junior high schools?
9. What is the influence of internet workshops on developing creative and intellectual activity among young learners, characterized by the following features: fluency, flexibility, originality and sensibility of thinking?
10. Are pathological phenomena, and which of them, caused by general introduction of internet workshops into schools? What actions are taken up by headmasters and teachers with a view to preferring values in the educational process against general access to information technology?
11. How is information technology used in diagnostics and pedagogical therapy?
12. What actions should be taken up during teachers' preparation for supporting the process of the reformation of Polish schools?

The research was carried out by means of three surveys. One of them was directed to the teachers taking part in the project: "The Internet in Each Borough". The second one was sent to the headmasters of the schools taking part in the above – mentioned project. The last one was given to the administrative workers in cities and the country. There were both closed and open questions in the surveys. 677 IT teachers, 1811 teachers of other subjects, 241 headmasters and 321 administrative workers took part in the survey. Notice, that the teachers of other subjects who took part in the research were computer-literate.

The influence of the general introduction of computers into schools on organizational, educational and didactic changes

The aim of this part of the research was a detailed evaluation of the usage of internet workshops in Polish education. During the research, relationships between mass introduction of computers into schools and, resulting from that, organizational, educational and didactic changes were described. The researchers were also trying to identify the difficulties regarding the proper usage of internet workshops.

The analysis was carried out in three domains: organizational change, didactic and educational change, and the factors, which influence the limits.

A) Organizational changes

The researchers wanted to identify organizational changes that were caused by the mass introduction of internet workshops into schools. During the research, they tried to understand how the mass introduction of computers into schools influences teachers' work and whether new internet workshops changed their organization and location in schools.

a) Organization of teachers' work

One of the main aims of the mass introduction of computers was intensive usage of internet workshops in schools. They were to be used by headmasters, teachers and students as much as possible. In order to check if internet workshops are used and how they are used, a few questions were asked. The answers are presented below. In Table 1, there are the results of the answers given by the teachers of information technology and other subjects, who indicated the areas in which computers are most often used in school. Each of them could choose out of three equal answers. The significant majority of IT teachers indicated the usage of the Internet in the process of education (96.45%) and in their own work (90.25%). Such usage of the Internet should be recognized by the authors as a proper and expected direction of the project "The Internet for Each Borough". Unfortunately, this situation does not seem so good when the frequency of internet workshops usage is taken into consideration.

Table 1: Using the Internet in Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	in educational process	653	96.45	422	23.30
2.	in administration	430	63.52	356	19.66
3.	to one's own work	611	90.25	1200	66.26
4.	in the canteen	21	3.1	12	0.66
5.	in the library	43	6.35	87	4.80
6.	in other way (describe it, please)	22	3.24	320	17.67
7.	no answer	24	3.55	611	33.74
Total		**677**		**1811**	

The usage of the Internet in school administration (63.52%), indicated by the above group of teachers, is also very interesting. It proves that the Internet is becoming an important source of information for administrative workers. The answers of teachers of other subjects are different. A significant number of them (66.26%) use the Internet for their own work. The Internet is used in the process of education by 23.30% of the teachers of other subjects. Analysing the usage of internet workshops by administration, we can see the difference of evaluation made by the IT teachers and teachers of other subjects. That is because the IT teachers, thanks to their competence, support school administration more often, and that is why they have a chance to better evaluate if and how the administration uses the Internet. The fact that a large number of teachers of other subjects (33.74%) did not answer the question concerning the usage of the Internet in their schools is significant. It cannot be ignored, as almost one third of the teachers did not give their opinion on this matter. The lack of opinion is significant. It might indicate that many teachers who are computer-literate but do not teach information technology do not know how to use school internet workshops.

The answer to the question about the usage of the Internet gives only a general idea, that is why the teachers were asked to define the Internet services used in school and the frequency of using the Internet. The teachers were to choose the most important three services in their opinion. The results were compiled in Table 2. The general analysis shows that teachers most often use web pages (87% of IT teachers, 54.67% of other teachers) and e-mail (77.84% of IT teachers, 55.77% of other teachers). The results show that people use the services which were emphasized during courses organized within the projects: "The Internet for Each Borough" and "The Internet for Junior High Schools". What is more, they do not require additional endeavour from the teachers, contrary to newsgroup, tele- and videoconferences. Looking at this matter from the point of view of additional schooling, more emphasis should be put on the skills needed in the educational process.

Online bulletins and publications are also very popular among the IT teachers (54.95%), as well as information databases (32.06%), and chat rooms (26.14%). The significant lack of answers (44.23%) in the survey for the teachers of other subjects is alarming. We can assume that at least a few teachers were not able to indicate the services they use. It should be reminded that these teachers declared to be computer-literate.

Effective usage of the Internet is connected both with different services and the frequency of using them by teachers. The answers of the teachers who use the Internet for their own purposes are compiled in Table 3. Over half of the IT teachers use the Internet for their own needs very often – every day, twice, or three times a week. Almost one fourth of the teachers use the Internet sporadically. The situa-

Table 2: The Internet Services Used by Teachers in Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	e-mail	527	77.84	1010	55.77
2.	newsgroup	177	26.14	45	2.48
3.	newslist	87	12.85	22	1.21
4.	Usenet News	63	9.31	18	0.99
5.	online bulletins and publications	372	54.95	243	13.42
6.	sending informative files FTP	176	26	440	24.30
7.	software bank – servers Archie	54	7.98	14	0.77
8.	Gopher system	64	9.45	17	0.94
9.	www	589	87	990	54.67
10.	information databases	217	32.05	155	8.56
11.	tele- & videoconferences	55	8.12	9	0.50
12.	no answer	6	0.87	801	44.23
Total		**677**		**1811**	

Table 3: Using the Internet by Teachers for Their Own Purposes

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	every day	175	25.85	66	3.64
2.	twice / three times a week	178	26.29	149	8.23
3.	twice / three times a month	149	22.01	356	19.66
4.	sporadically	166	24.52	554	30.59
5.	never	3	0.44	611	33.74
6.	write how often	4	0.59	34	1.88
7.	no answer	2	0.30	41	2.26
Total		**677**		**1811**	

tion among the teachers of other subjects is even worse – 31% of them claim sporadic usage of the Internet for their own purposes. Such a big number of teachers, knowing how to use computers, but not using the Internet, is alarming, as it means significant limitation of using information technology in school, decrease of computing competence in the course of time, and less chance for using the Internet in the process of additional schooling and self-improvement of teachers than it was expected on the basis of statistics. The teachers who use the Internet for their own purposes release the activity in terms of absorbing new technologies, and they are

up-to-date with new versions of software. Searching for information they have an opportunity to know the information structure, etc. The fact that a quarter of the IT teachers use the Internet for their own purposes sporadically, indicates that it has been out of their habit so far and that they treat their lessons formally.

The research results presented so far, indicated the areas of the usage of internet workshops in school, presented the internet services which are used by teachers and showed the scale of internet workshops usage by teachers for their own purposes. The results revealed a relatively small influence (in comparison to the expectations) of workshops on organizational changes in school.

b) organization of the workings of internet workshops in schools

Trying to find an answer to the first question, the influence of workshops introduced into schools on the organization of teachers' work has to be shown. Defining the influence depends on a few factors: for example access to workshops.

The frequency of using internet workshops by the IT teachers and teachers of other subjects is presented in Table 4. A few tendencies are clearly seen, which are worth taking into consideration. Only 10.04% of the teachers use internet workshops during every lesson, and up to 44.76% once a month. The statistics confirm that schools do not use up the limit of free connections offered by the telecommunication company.

The teachers of other subjects (not IT teachers) use internet workshops rarely and, what is worrying, 55.49% do not use them at all. It is worth considering that if teachers use internet workshops they use them rather in the process of education.

Table 4: The Frequency of Using Internet Workshops for Didactic Aims

Entry No	Answers	No of answers			
		No of IT teachers	%	No of other teachers	%
1.	yes, during every lesson or after lesson	68	10.04	43	2.37
2.	yes, very often	87	12.85	56	3.09
3.	yes, often	103	15.21	84	4.64
4.	yes, once a month	303	44.76	130	7.18
5.	yes, rarely	26	3.84	181	9.99
6.	yes, very rarely	36	5.32	197	10.88
7.	no, never	20	2.85	1005	55.49
8.	no answer	24	3.55	115	6.35
total		**677**		**1811**	

Analysing the results of the research presented in Table 4, we observe that some IT teachers did not answer the question about the frequency of using internet workshops for didactic purposes. We can assume that most of them refused to answer because they do not use workshops for educational aims. It means that the number of teachers not using internet workshops is even higher.

The statistics compiled in Table 4 do not present an important matter – the free access to internet workshops in schools. It is important for defining limits in using internet workshops in school.

Table 5: Accessibility of Internet Workshops in Schools for Teachers

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	yes, free access	487	71.94	176	26
2.	yes, but limited (write in what way)	128	18.91	325	48.01
3.	no access	54	7.98	162	23.93
4.	no answer	8	1.18	14	2.07
Total		**677**		**1811**	

Table 6: Students' Free Access to the Internet after Lessons

Entry No	Answers	IT teachers		Teachers of other subjects	
		No of IT teachers	%	No of teachers	%
1.	yes	287	42.39	726	40.09
2.	no	245	36.19	378	20.87
3.	I don't know	124	18.32	531	29.32
4.	no answer	21	3.10	176	9.72
Total		**677**		**1811**	

Analysing the teachers' answers (almost 72% of IT teachers and 26% of teachers of other subjects), we observe that generally the teachers have no formal barriers in access to internet workshops (cf. Table 5). Limitations are observed by 18.91% of the IT teachers and 48.01% of other teachers. One of the major barriers indicated by the teachers, as far as the access is concerned, are lessons which take place in internet workshops.[1] The teachers indicated that headmasters are not good coordinators as far as the usage of internet workshops is concerned. What is more, the workshops are not so often occupied after morning lessons (cf. Table 6). In general, internet workshops are not used in the afternoon. Only 42.39% of the IT teachers and 40.09% of the teachers of other subjects claimed that internet workshops are accessible for students in the afternoon (cf. Table 6). The fact that almost a quarter of the IT teach-

[1] This matter is presented more precisely in the part on barriers.

ers and one third of the teachers of other subjects do not know whether students have access to the workshops or not, must be considered. This fact indicates a lack of interest in the process of education in school. It is worrying that a relatively big number of the IT teachers is not interested whether students develop their computing competence. It has a huge impact on the results of the process of education.

The results presented in Tables 5 and 6 show that the lack of access of a large number of teachers to internet workshops and, at the same time, lack of interest of some IT teachers and teachers of other subjects may influence students' didactic and educational achievements in school. It is one of the important factors determining the relatively low effectiveness of the usage of internet workshops in primary schools and junior high schools.

Table 7 presents teachers' major problems in terms of using the Internet. The first one, as the teachers indicated, is keeping internet workshops occupied with information technology lessons. The second problem indicated by the teachers of other subjects (30.98%), which is quite distinctive, is too much expense connected with using the net. On the other hand, the IT teachers signalled the problem of constant surveillance over the technical matters connected with the net (26%). The fact that a quarter of the IT teachers conceived the problem of constant surveillance as a barrier in using the Internet indicates that new organizational solutions should be formulated by the Ministry of Education. Otherwise, internet workshops will be closed, and the model which has been functioning so far will be still in force. It should be emphasized that it is not only the matter of finding extra funds in the budget for teachers doing overtime, but also having a guarantee that the Internet will be used according to its destiny and according to some rules, for example impressing socially desirable values on students.

Other barriers listed by the teachers are also noteworthy: for example, weak transfer function of telephone line, frequent breakdowns of equipment (modem and ISDN of wrong configuration, down-market and too slow equipment, insufficient speed of data transfer), too many students in the classroom, which requires frequent re-installing of software in spare time, lack of schooling of all interested teachers using the Internet, and too little time during lessons, which makes additional consultations necessary.

Each delivered internet workshop was equipped with basic software. That means that in order to use it comprehensively, it needs constant complement in new educational software. Hardware also needs to be constantly renewed in view of computing advance. Modern equipment assigns remarkably educational possibilities. Analysing environment's involvement in the modernization of workshops delivered on administration centre's initiative, it is possible to have an insight into the matter of attitude towards changes in education. Readiness of the environment

Table 7: The Major Problems of Using the Internet in Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	too much expenses connected with using the net	115	16.99	561	30.98
2.	insufficient telephone line	142	20.97	245	13.53
3.	no possibility of constant surveillance over the net's technicality	176	26	112	6.18
4.	frequent breakdowns of equipment	75	11.08	153	8.49
5.	internet workshops occupied with IT lessons	162	23.93	688	37.99
6.	other problems	6	0.89	52	2.87
Total		**677**		**1811**	

for modernization means their understanding of educational needs in terms of modern information technology. It is also some kind of a proof of acceptance of changes, and willingness to join the process of modernization of education. One should realize that achieving high results in education based on computers requires changes in organization and workings of education, because it means a totally differentschool than the school we have today. The degree of interest in broadening the possibilities of using workshops allows us to tell whether the workshops were accepted by the environment for non-educational reasons (for example: because it behaves, it can boast about computers) or because of an authentic need for the access to information in teachers' environment and borough.

Table 8: Teachers' Knowledge about the Development of Internet Workshops

Entry No	Does the development of internet workshops delivered within the project "The Internet for Each Borough" take place	No of IT teachers	%	No of other teachers	%
1.	yes	251	37.08	181	9.99
2.	no	365	53.91	923	50.97
3.	I don't know	40	5.91	592	32.69
4.	no answer	21	3.10	115	6.35
Total		**677**		**1811**	

Asking the teachers about the development of internet workshops, a positive answer was given by 37.08% of the IT teachers and 9.99% of other teachers (cf. Table 8). It means that somewhat over 37% of the workshops were developed. Other subjects teachers' little knowledge on this matter is alarming, as it means a

lack of their interest in what happens in school. Despite the fact of being qualified (at least they claimed so) in using computers, they are not interested in this matter. This issue has a wider aspect. It indicates taking no effort in improving qualifications. This matter will be discussed more extensively in further part of the results' presentation. Because the development might be connected with different financial sources, there are sponsors presented in Table 9. 8.86% of school workshops was granted from the borough's budget. The biggest number of workshops were modernized by schools themselves (18.02%). Some part of the sponsorship was taken on by parents. Some sponsors were won from outside or through school's own activity and the gift of the President of the Republic of Poland.

Table 9: Funds for the Development of Workshops

Entry No	The sources of funds	No of IT teachers	%	No of other teachers	%
1.	borough's budget	60	8.86	23	1.27
2.	school's budget	122	18.02	91	5.02
3.	private business	21	3.11	24	1.33
4.	parents	46	6.79	43	2.37
5.	I don't know	272	40.18	1002	55.33
6.	other sources	8	1.18	25	1.38
7.	no answer	148	21.86	603	33.3
Total		**677**		**1811**	

An important clue signalizing the attitude towards internet workshops installed in school, is the data compiled in Table 10. Over 59% of the IT teachers and 9% of the teachers of other subjects declared their involvement in the development of the workshops. Almost half of the teachers not teaching IT but having computing qualifications (46.66%) and a quarter of the IT teachers (25.56%) did not make any effort in order to develop internet workshops. The lack of involvement among a significant number of teachers is connected with the barriers they have. To overcome the barriers, teachers need a different process of education and schooling in the information technology domain.[2]

The teachers' answers describing different forms of involvement in the development of internet workshops are interesting. Here are the most frequent forms of involvement indicated by them:

– addressing proposals for buying equipment, software, repairs;
– suggesting what and where to buy;

[2] Cf. item D of this article.

– raising money among students who use internet workshops;
– buying computer programmes, books, journals;
– arranging the workshop, equipping it with didactic aids;
– slight restoration.

The above forms show that the teachers focused their activity on counselling, buying equipment, software and didactic aids, arranging the workshop, and raising money among students.

Table 10: Teachers' Declaration of Involvement in the Development of Internet Workshops in Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	yes	405	59.82	163	9.0
2.	no	173	25.56	845	46.66
3.	I don't know	38	5.61	652	36.0
4.	no answer	61	9.1	151	8.34
Total		**677**		**1811**	

B) Didactic and educational changes

In the first part of the presentation of the results, the problem of the influence of mass introduction of computers into schools on their organizational changes was presented. The results showed how much they influenced the organization of teacher's work and organization of the workings of internet workshops in school. Now, the influence of internet workshops on the changes in didactic and educational domain will be defined. During the research, the teachers evaluated the environment and themselves as far as preparation to lessons in internet workshops is concerned. They indicated the reasons for which conducting lessons in workshops was impossible and defined the frequency of using the Internet for didactic aims.

Let us analyse, then, the teachers' opinions on the organizational (Table 11), didactic (Table 12) and educational changes (Table 13), which, were the result of the introduction of internet workshops into schools. 41.97% of the IT teachers and 51.4% of the teachers of the other subjects did not answer the question about organizational changes. If we add to that number 8.71% of the answers of the IT teachers and 14.16% of the teachers of other subjects indicating no changes, we will get the vision of influence of internet workshops on the organization of the educational process, which is far from expectations. The lack of answers means that the teachers did not see anything important in this matter, that is why they

preferred not to fill-in this part of the survey. If we assume that most of the teachers who did not answer the question about changes, do not see them, then almost half of the IT teachers do not see the changes between what was before introducing computer workshops into schools and what is now. It is surprising in as much as they are people who should see the organizational changes first and foremost. Meanwhile, if we take into consideration the teachers who do not see any changes and those who see only a few of them, we will see that only approximately 40% of the IT teachers and about 15% of the teachers of other subjects perceived the influence of internet workshops on the organization of the didactic and educational process in school. Such a small percentage of the teachers seeing those changes must be taken into consideration in terms of the reasons for such a situation. Not perceiving the changes by such a great number of teachers indicates the workshop's isolation from the rest of the school at the very beginning of its existence. The Internet workshop which lives its own life independently of the school, is a contradiction to its expected role. Many factors influence its isolation, first of all, mistakes made in the process of teachers' preparation to work with the computer. There is no sufficient emphasis on defining the position of the workshops in school, their role in organizational, and didactic and educational activities in supporting the local society in this process. In the process of teachers' schooling too much emphasis, was put upon the technical matters of the usage of computers in the workshop, and too little upon methodology and indicating the areas of its usage in the process of school education. Not seeing the organizational changes by a great number of the teachers implies a need for changes in the system of teachers' education, schooling, and self-improvement in information technology. I will go back to this problem in detail when describing the didactic and educational changes in school as a result of mass introduction of internet workshops into schools.

The teachers' opinions on the changes they observed in the organization of the didactic and educational process in school were divided into several distinctive groups. They saw changes in: the organization of the didactic process, extracurricular classes, teacher's own work, the curriculum and in the increase of data security (cf. Table 11).

Among the organizational changes connected with the didactic process, which were listed by the teachers most often, was leaving free time for using the Internet by students (34.12%), using the Internet during lessons (26.44%), dividing students into groups according to their knowledge and abilities (24.31%), using the Internet during almost every IT lesson (22.9%), doing in-class tasks, editing a school bulletin, school's web page, e-mail (19.5%), arranging computer desks in different classrooms and school library (16.4%), and access to authentic, new materials (16.25%). The presented data imply that a significant number of the teachers use

the Internet to achieve better organizational results of the educational process. The dominant sphere is searching for information and making it available. This tendency is even more distinctive among the teachers of other subjects (cf. Table 11). This tendency indicates the correctness of the system of teachers' preparation in terms of showing the usefulness of the Internet in school. Courses organized for teachers within the projects "The Internet for Each Borough" and "The Internet for Junior High Schools" offered a lot of exercises connected with the Internet. The results of the above activity are reflected in the teachers' opinions on using the computer net in the organization of the educational process.

A relatively big number of the IT teachers (over two thirds of those who saw changes in the organization of the educational process) recognized the possibility of leaving children free time during lessons for using the Internet as an organizational change. They had a similar opinion about changes in the process of education itself (cf. Tables 12 and 13). Because this opinion concerns a large number of the teachers, let us look at this matter closely. During additional interviews, the teachers justified their standpoint arguing that, thanks to that, students have proper conditions for self-improvement, they can also collect information connected with other subjects, and, at the same time, improve computing skills connected with the Internet. The teachers also admitted that it is a beneficial follow-up of the lesson. This argumentation indicates multiple motives, which accompanied the decision of leaving free time during lessons in order to create favourable conditions for browsing the supplies of the Internet by students themselves. This standpoint is influenced by the myth created in teachers' consciousness, according to which students themselves may take action for achieving high results in education. Such reasoning is false. As it was proved in numerous experiments on using the Internet by students themselves, carried out in primary schools and junior high schools, on the one hand, students browse the Internet randomly, on the other hand, they focus their attention on current cultural phenomena interesting them, such as Big Brother. Disregard of teachers' actions, their role of leaders during lessons, and careful planning of the education process lead to a decrease of the results of education. A significant majority of students require the limitation of freedom, because it is profitable for them as far as educational results are concerned. Only a small group of students, possessing biological conditions, needs freedom of actions.

In the second group of the organizational changes accomplished by teachers in the didactic and educational domain after introducing internet workshops into schools, the teachers listed: interest circles (11.37%) and using workshops for extracurricular classes (3.10%) outside the organizational changes distinguished by the teachers indicate workshops' little role in extracurricular classes. It has a significant influence on not using these workshops during lessons.

The situation is similar as far as the evaluation of the teachers' own work is concerned. The fact that the majority of the teachers do not see any changes in this sphere must awake anxiety as this means that in spite of possessing internet workshops by schools, a significant majority of the IT teachers and teachers of other subjects prepare for lessons in a traditional way.

No significant organizational changes regarding the curriculum can be affirmed. Computers, as any other aid that has been used in school so far, require organizational and didactic changes. That is why, analysing the teachers' answers concerning changes in the organization of the curriculum, transformations happening in modernization of the system might be defined. Because a small number of the teachers (slightly over 7%) pointed out creating new curricula and introducing the Internet into syllabuses, we can assume that workshops slightly influence the changes happening in the organization of the educational process.

Table 11: The Organizational Changes Accomplished by Teachers in the Didactic and Educational Domain after Introducing Internet Workshops into Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	No changes	59	8.71	347	19.16
2.	Slight changes – limited access to the net	67	9.90	451	14.90
3.	Organizational changes connected with the didactic process:	21	3.10	38	2.1
	– some lessons are carried out in internet workshops	165	24.37	5	0.28
	– dividing students into groups according to their abilities and knowledge	179	26.44	126	6.96
	– using the Internet during lessons	110	16.25	326	18.0
	– access to authentic, new materials	13	1.92	0	0
	– not introducing the operating system DOS to the detriment of the students	9	1.33	0	0
	– defining some criteria of forming groups and using them according to needs				
	– preparing computer desks in different classrooms and school library	111	16.4	253	13.97
	– finally I can conduct IT lessons	93	13.74	0	0
	– using multimedia programmes during lessons	91	13.44	148	8.17
	– introducing competition between groups	6	0.89	5	0.28

Entry No	Answers	No of IT teachers	%	No of other teachers	%
3.	– encouraging students to browse the Internet to find information	95	14.03	479	26.45
	– writing in-class tasks, editing school bulletin, school's own web page, e-mail	132	19.05	384	21.2
	– implementing cross-curriculum links				
	– using the Internet during almost every IT lesson	27	3.99	49	2.71
	– using new organizational methods	155	22.90	0	0
	– the organization of the lessons and their conducting is easier	43	6.35	201	11.1
	– conducting electronic tests and checks	16	2.36	254	14.03
	– introducing IT lessons in lower-primary school	24	3.55	7	0.39
	– students prepare didactic presentations using the Internet and multimedia programmes	61	9.01	147	8.12
	– providing students with didactic material on floppy disks	71	10.49	104	5.74
	– new organization makes students' own work possible	24	3.55	4	0.22
	– leaving students free time for using the Internet	48	7.09	102	5.63
		231	34.12	125	6.9
4.	Extracurricular classes:				
	– interests circles	77	11.37	71	3.92
	– using internet workshops during additional classes	21	3.10	36	1.99
5.	Teacher's own work:				
	– writing lesson plans, timetable of interests circles without the calendar	14	2.07	83	4.58
	– using other teachers' publications	32	4.73	160	8.83
	– making information technology more accessible and common among teachers	65	9.60	117	6.46
	– collecting information in databases, printing information for parents	9	1.33	6	0.33
	– preparing lesson plans by the computer, making use of ready-made tests and didactic aids	76	11.23	91	5.02
	– storing school records in the computer				
	– using ready-made lesson scenarios, tests, methodology guides	51	7.53	217	11.98
		63	9.31	87	4.80

Entry No	Answers	No of IT teachers	%	No of other teachers	%
6.	Curriculum changes: – creating author's programmes – modification of curriculum-introducing matters connected with the Internet – introducing IT in exchange for technology	10 14 24	1.48 2.07 3.55	104 145 0	5.74 8.01 0
7.	Increase of data security	12	1.77	0	0
8.	No answer	348	41.97	760	51.40

Note: The answers were given by 58.03% of the IT teachers and 48.60% of teachers of other subjects. The teachers could give an unlimited number of answers of the organizational changes in the didactic and educational domain accomplished by the teachers themselves after introducing internet workshops into schools.

The teachers in the research not only defined the organizational changes, but also changes in the didactic domain which occurred after introducing internet workshops into schools. The teachers' opinions on this subject were grouped and presented in Table 12, thereby six groups were created, which included changes in the domain of new educational methods and forms, searching for information, making didactic aids, extracurricular classes, teacher's own work and changes of the curriculum.

Among the changes of the curriculum indicated by the teachers, one might distinguish: possibility of implementing the whole curriculum in school (35.45% of the IT teachers and 33.79% of the teachers of other subjects). Such a big group perceiving the fact of implementing the whole school curriculum as a change, indicates its appreciation for the importance of IT education. The teachers realize that the curricular basis has to be implemented by school, and its consequences concerning students. Such a standpoint is an important factor of teaching environment's maturity in modern educational requirements.

In the schools which were given internet workshops instead of old, rudimentary, poorly equipped ones the teachers perceived this fact as an important change in implementing the whole IT curriculum. This opinion also signalizes difficulties in implementing the curriculum which occur in schools having only four or five computers.

A small number of the teachers indicated as a change the appearance of new timetable adjusted to possibilities of using the Internet, the introduction of new IT lessons in the first grade of lower-primary school, the increase in the number of lessons taking place in internet workshops, the introduction of classes thematically

connected with the subject, and adjustment of the didactic process to workshops' capacity. (cf. Table 12).

The workshops' influence on the introduction of pedagogical innovation and author's IT programmes into the didactic process, turned out to be marginal. Indicating pedagogical novelties only by 1.48% of the IT teachers and 0.44% of the teachers of other subjects, suggests a need for introduction of a larger number of pedagogical classes into additional schooling, which makes teachers eligible to teach information technology. The weakness of the whole teachers' IT schooling system is revealed here. It has an influence on the quality of education, and, as a consequence, on the educational results, not only in the information technology domain, since information technology influences and will influence more and more the results of the whole school work.

In another group of answers concerning the changes in the domain of new methods and educational forms, the IT teachers pointed out different methodological and didactic enterprises most often: implementing interactive multimedia applications (34.86%), initiating the youth into information technology (31.31%), making web pages with students (23.93%). Lessons are more attractive (24.37%), and students absorb knowledge easier and more willingly (20.94%).

The changes perceived by the teachers of other subjects were similar, but on a smaller scale, for example: implementing interactive multimedia applications was perceived by 23.80% of the respondents, initiating the youth into information technology by 26.23%, making web pages with students by 17.89%, lessons are more attractive by 16.07%, and students absorb knowledge easier and more willingly by 15.30%.

The presented results show that enterprises that were indicated most frequently, are connected with hardware (multimedia, web pages). The fact that the teachers of other subjects indicate lesson attractiveness and better absorption of knowledge but, at the same time, use internet workshops in schools minimally, is very distinctive. We can assume that teachers rather rely on current opinions about information technology than on school reality. We must presume that, to a certain extent, this is also true as far as IT teachers are concerned. The small number of the teachers who saw changes which occurred as a result of introducing internet workshop into school is a proof. These changes concern new methods of work, for example: active methods, individualized teaching (this change was indicated by 4.28% of the IT teachers and 6.18% of other teachers), and interdisciplinary usage of the computer and the Internet in education (2.36% and 1.16% respectively).

The preparation of the didactic process has a significant influence on educational results. Computers connected to the Internet are an important tool in making didactic aids. That is why, defining the changes that occurred in schools as a result

of introducing internet workshops we cannot disregard making didactic aids by the computer, since it is an important domain of the modernization of the whole educational process. Four enterprises, the most frequently distinguished by the teachers, connected with making didactic aids, which were influenced by school internet workshops, are presented in Table 12. According to the data, using internet workshops for making didactic aids is sporadic. 3.25% of the IT teachers and 1.38% of the teachers of other subjects declared preparing and using aids, such as printing boards, drawings, making transparencies. A slightly bigger group of the teachers indicated making multimedia presentations (5.32% and 1.77% respectively). There is a significant difference between making multimedia didactic aids and their usage in the process of education. That means that the vast majority of multimedia aids used by teachers in the process of education is not made by them. If we add to this number a minimal percentage of teachers who organize students' work so that they prepare aids by themselves, we will be able to assume that teachers use ready-made aids, which does not promote individualized teaching. Using standard universal multimedia applications to such a big extent means that innovatory and creative actions are not taken into consideration in the process of education. Meanwhile, information technology creates a significant possibility of making didactic aids. In the group of the teachers organizing students' work so as they prepare didactic materials by themselves, there were a few of them who gave upper-primary school students assignments of preparing aids for lower-primary ones. Thereby, conditions for the educational process, based on the system of projects made by students themselves, are created.

Among the didactic aids made by the teachers, there are guidebooks, and other computing applications used mostly during IT lessons. Unfortunately, a small population of the teachers declare that they make them themselves. It is a pity, since both guidebooks and other computing applications make the educational process more up-to-date. The application of guidebooks describing the rules of using hardware, and showing how to use it, minimizes the period of time devoted to the "ABC" of information technology, during the lesson which decreases the risk of making a lesson of computer keyboard usage instead of IT lessons.

Finally, let us look at the changes in two domains: extracurricular classes and teacher's own work. In both cases, the influence of internet workshops introduced into school is scarce. (cf. Table 12).

To sum up the influence of internet workshops on the didactic changes which occurred in school it can be said that it is not satisfactory enough. The technical aspect of using internet workshops is distinctly predominant. The teachers' creativity is marginal in all actions which are taken up by them.

Table 12: The Didactic Changes Implemented by Teachers after Introducing Internet Workshops into Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	No changes	49	7.24	356	19.66
2.	Slight changes – limited access to the net	74	10.93	462	25.51
3.	Curriculum changes:				
	– more lessons in internet workshops	291	42.98	140	7.73
	– new timetable adjusted to the possibilities of using the Internet	74	10.93	70	3.87
	– implementation of the whole curriculum in school, including IT education	240	35.45	612	33.79
	– adjustment of the didactic process to workshops' capacity	287	42.39	103	5.69
	– introduction of IT lessons in the first grade of lower-primary school	60	8.86	41	2.26
	– using the Internet during lessons	158	23.34	52	2.87
	– introduction of pedagogical innovation and author's IT programmes into the didactic process	10	1.48	8	0.44
	– introduction of more classes thematically connected with the subject	48	7.09	27	1.49
	– conducting non-IT lessons in internet workshops	36	5.32	31	1.71
4.	Didactic changes – new forms and methods of teaching:				
	– lessons are more attractive	165	24.37	291	16.07
	– students absorb knowledge easier and more willingly	142	20.94	277	15.30
	– introduction of new methods of work (active methods, individualized teaching)	29	4.28	112	6.18
	– usage of interactive multimedia applications	236	34.86	431	23.80
	– defining tasks and problems which students are able to solve by means of the Internet	78	11.52	124	6.85
	– introduction of new forms of checking knowledge (crosswords, puzzles, tests)	16	2.36	49	2.71
	– making web pages with students	162	23.93	324	17.89

Entry No	Answers	No of IT teachers	%	No of other teachers	%
4.	– initiating the youth into information technology	212	31.31	475	26.23
	– teaching self-improvement by means of the net	76	11.23	73	4.03
	– interdisciplinary usage of the computer and the Internet in didactics	16	2.36	21	1.16
5.	Didactic changes – searching for information:				
	– using educational servers	108	15.95	201	11.10
	– the possibility of accessing the latest didactic material from the Internet	166	24.52	257	14.19
	– the possibility of using e-mail	221	32.64	388	21.42
	– quick access to information	56	8.27		
	– encouraging students to use the Internet as a new way of finding information	99	14.62	121	6.68
	– students learn how to gain information and solve problems	27	3.99	39	2.15
	– acquiring the skill of proper verification and usage of information in the learned subject	68	10.04	149	8.23
6.	Making didactic aids:				
	– allows to prepare and use aids by teachers themselves	22	3.52	25	1.38
	– students prepare aids by themselves	8	1.18	7	0.39
	– making multimedia presentations	36	5.32	32	1.77
	– making guidebooks and other didactic aids	12	1.77	4	0.22
7.	Extracurricular classes:				
	– knowing new possibilities of gaining extracurricular knowledge	41	6.06	24	3.55
8.	Teachers' own work:				
	– enriches professional background	88	13.00	165	9.11
	– making interactive lesson plans	24	3.55	33	1.82
9.	No answer	287	42.39	904	49.92

The results compiled in Table 13 concern the changes in the domain of educational upbringing, which occurred as a result of introducing internet workshops into schools. Answers were given by 573 IT teachers (ie 84.64%); 244 of them (36.04%) indicated no changes and 196 (28.95%) – slight ones. Only 19.65% of the IT teachers pointed out changes in the domain of educational upbringing. Answers

were also given by 1449 teachers of other subjects (ie 80.01%); 792 of them (43.92%) perceived no changes and 451 (24.9%) – slight ones. Only 11.19% of the teachers of other subjects saw changes in the domain of educational upbringing after introducing internet workshops into schools.

Changes in the domain of educational upbringing, indicated by the teachers, were divided into several groups:

- changes in the domain of global computing culture and the culture of using the Internet
- changes caused by the teachers' actions in order to direct their students and prevent them from pathology
- changes caused as a consequence of supporting weekly class meetings with information technology, and preparation of the process of upbringing
- changes caused by cooperation with other teachers, using information technology.

The domain of global computing culture includes safety and hygiene of work when using equipment, the culture of using a computer and preventing software from being afflicted with viruses. The results of the research compiled in Table 13, distinctly indicate the changes which occurred as a result of introducing internet workshops into schools in the domain of safe work with a computer (45.79% of IT teachers) and changes caused by teachers' work with a view to limit the transmission of viruses. 47.41% of the respondents indicated these changes. The teachers of other subjects saw these changes as much worse. (cf. Table 13). A relatively small group of teachers perceiving changes in using computers according to school internet workshop regulations and a small group indicating concerted care of equipment is also surprising. The differences in the teachers' evaluation of individual elements of the global computing culture indicate their interest in matters connected with hardware in the educational process.

The second group of the changes involves the culture of using the net by students. The teachers perceived many changes here, for example: the culture of coexistence in the world of global transmission of information, making students aware of dangers coming from the Internet and of brutality of computer games, the problem of computer addiction, skilful and proper usage of the Internet, conducting lessons on using multimedia wisely and reasonably, publishing the survey of internet users on a web page. This group of changes is particularly important for the process of educational upbringing. The culture of communication has a huge impact on politeness of students' expression. The IT teachers (22.6%) and the teachers of other subjects (24,24%) pointed out the changes observed among students, being a result of the process of upbringing implemented thanks to the existence of internet workshops in schools. Unfortunately, not all of them highlighted the

positive aspect. Two thirds of the teachers who took part in the survey (mainly of other subjects) signalled the popularization of both internet slang and swear-words through internet workshops. This opinion was shared by a large group of junior high school teachers.

Making students aware of dangers is an important domain of the teacher's work as far as upbringing is concerned. Positive changes among students observed by the teachers in this domain of upbringing are very small. Such changes were signalled by 4.72% of the IT teachers and 5.74 of the teachers of other subjects. Definitely more IT teachers (27.62%) and teachers of other subjects (29.1%) indicated a sudden increase in the interest in pornographic and aggression popularizing pages. One should expect that the problem will escalate along with the increase in the number of internet workshops in education. Counteracting this phenomenon requires the introduction of topics concerning the ways of preventing pathology into schooling and curricula. It requires the introduction of multimedia education into IT lesson.

Publishing the survey of internet users on one's own pages should be recognized as a very valuable initiative, worth popularization. Encouraging students to create and widespread their own survey is an important educational action in the domain of prevention.

Table 13: The Upbringing Changes Caused by the Introduction of Internet Workshops into Schools

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	No changes	244	36.04	792	43.72
2.	Slight changes – limited access to the net	196	28.95	451	24.90
3.	Computing culture:				
	– teaching safe and hygienic work with a computer	310	45.79	215	11.87
	– the problem of viruses	231	47.41	122	6.74
	– using computers according to the school internet workshop regulation – culture of computer usage	104	15.36	294	16.23
	– concerted care of equipment	71	10.49	124	6.85
4.	Directing student's actions:				
	– developing students' interests	135	19.94	231	12.76
	– teamwork, cooperation among students, competition among groups	43	6.35	52	2.87
	– student's intellectual and social development	25	3.69	63	3.48

Entry No	Answers	No of IT teachers	%	No of other teachers	%
4.	– developing students' interests in multimedia education	23	3.40	88	4.86
	– students' behaviour in the internet workshop	104	15.36	55	3.04
	– directing student's work towards computer creativity	268	39.59	258	14.25
	– enabling students from pathological families to spend free time meaningfully (taking part in extracurricular classes)	4	0.59	6	0.33
	– showing an interesting way of organizing free time with a computer	20	2.95	25	1.38
5.	The culture of using the net:				
	– the culture of co-existence in the world of global transmission of information (e.g. the culture of discussion on the net)	153	22.6	439	24.24
	– making students aware of dangers coming from the Internet (e.g. addictions, pornography, aggression)	32	4.72	104	5.74
	– making students aware of brutality of computer games	43	6.94	146	8.01
	– the problem of computer addiction	3	0.44	261	14.41
	– skilful and proper usage of the Internet	108	15.95	11	0.61
	– conducting lessons on using multimedia wisely and reasonably	61	9.01	8	0.44
	– publishing a survey for internet users on web pages	5	0.74	2	0.11
	– increase of interest in violence on the Internet (aggression, hatred, pornography etc.)	187	27.62	527	29.1
6.	Preventing pathology:				
	– making students aware of liability for using illegal programmes	47	6.94	45	2.48
	– using special filters preventing access to certain information, e. g. pornography	49	7.24	48	2.65
	– controlling content which students have access to, when working at a computer	31	4.58	65	3.59

Entry No	Answers	No of IT teachers	%	No of other teachers	%
7.	Supporting weekly class meetings:				
	– using ecological education and health programmes which are available in school	75	11.08	275	15.18
	– introducing programmes for teaching traffic regulations, etc into weekly class meetings	51	7.53	58	3.20
	– using computers during weekly class meetings	27	3.99	60	3.31
	– knowing students' problems connected with information technology	81	11.96	45	2.48
	– using as a multimedia source of social knowledge	91	13.44	226	12.50
	– introducing topics connected with the European Union- using information on this subject accessed from the Internet	25	3.69	48	2.65
	– improving discipline in the classroom and school	21	3.10	23	1.27
	– integration of a class, students help each other	43	6.35	39	2.15
	– lecture on using the Internet during weekly class meetings and parents' meetings	28	4.14	123	6.79
8.	Preparing the process of upbringing:				
	– accessing necessary information from the Internet	26	3.84	96	5.30
	– updating one's plan of the upbringing process	16	2.36	79	4.36
	– searching for literature supporting the process of upbringing	18	2.66	125	6.90
	– enriching the upbringing process	9	1.33		
9.	Cooperation with other teachers:				
	– exchanging opinions with other teachers on educational matters	155	22.89	206	11.37
10.	No answer	104	15.36	362	19.99

We can prevent negative phenomena by directing students' actions, stimulating their interest, directing students' work towards computing creativity, developing students' interests in multimedia education, organizing teamwork, coordination among students, competition among groups, students' intellectual and social development, showing an interesting way of organizing free time with a computer,

and popularizing students' proper behaviour in the workshop. Pedagogical actions with a view to creating conditions for spending free time valuably for students from pathological families are meaningful. It requires the system of extracurricular classes.

Analysing the teachers' opinions on the changes in the domain of preventing the above -described negative phenomena, it can be seen that the introduction of internet workshops has not produced the expected results. Apart from the changes in the domain of behaviour during lessons conducted by the IT teachers (15.36%) in the workshops and developing students' interests (19.94% of the IT teachers and 12.76% of other teachers), there are no significant changes. Theoretical and practical weakness of IT methodology implemented during studies and schooling of different types is clearly shown here. There is a need for the introduction of some standards in the domain of upbringing into information technology by the Ministry of Education, which should be the basis of IT teachers' employment in school.

Actions taken by some teachers (a slight number so far, cf. Table 13) such as prevention of piracy and introduction of filters controlling access to information popularizing violence are worth mentioning. Evaluating the teachers' answers concerning this matter, it seems that this change, in comparison with the needs in the domain of pathology prevention, is too small. Controlling the topics to which students have access during browsing the Internet in school is the teacher's basic duty, meanwhile, only 4.58% of the IT teachers and 3.59% of other teachers signalled a change in this domain.

An important change caused by the introduction of internet workshops into schools is using computers as support of weekly class meetings. The teachers most often indicated using information technology for class integration, stimulating students' mutual help, visualizing lectures during weekly class meetings and parents' meetings on using the Internet and improvement of discipline in the classroom and school. The introduction of computers into schools contributed to essential support of school goals e. g.: using ecological education and health programmes available at school, introducing programmes for teaching traffic regulations, introducing topics connected with the European Union – using information on this subject and other topics discussed during weekly class meetings accessed from the Internet. A distinct change indicated by the teachers, caused by the introduction of internet workshops into school, is using computers as a source of social knowledge. Weekly class meetings with the usage of computers promote recognition of students' difficulties connected with information technology; they are an important element of preventing pathology. The results presented in Table 13 show that changes are slight: of more than ten per cent as

far as promotion of knowledge is concerned, and of several per cent as far as upbringing items are concerned.

In the domain of preparation of the upbringing process the teachers used information technology for accessing necessary information from the Internet, updating their plan of the upbringing work, searching for literature supporting the upbringing process, and for visual enriching of the subjects which are an important element of the upbringing process in school. Analysing the presented results, one may assume that the observed changes are slight (of several per cent), at the same time, one should remember that Polish internet supplies concerning pedagogical counseling and ready-made material helpful in conducting weekly class meetings are not large. Only subjects connected with hacking and pornography are extensively presented in the Internet.

Teachers' mutual cooperation in the domain of upbringing should be evaluated positively. This cooperation mainly boils down to exchanging opinions on upbringing topics with other teachers. This phenomenon is signalled by 22.89% of the IT teachers and 11.37% of other teachers. Undoubtedly it should be recognized as an important change in the domain of upbringing caused by the introduction of internet workshops in schools.

In Table 14 there are the results of the research which show the evaluation of teachers eligible to conduct lessons in the internet workshop. A vast majority of the IT teachers (41.06%) and some part of other teachers (32.03%) indicated a custodian to be the person competent enough to conduct lessons in internet workshops. Such a standpoint is understandable, since admission to internet workshops imposes a new responsibility on custodians who are IT teachers. Taking by the teachers of other subjects such a stand on custodians' admission to internet workshops is a form of conformity, excusing themselves for being passive in taking up initiatives connected with using computers in the didactic process. One should remember that this conformity concerns teachers who are computer-literate.

This opinion has its further repercussions, since it influences educational practice and stunts access to internet workshops. Treating an internet workshop as a kind of incestuous enclave leads to creating a kind of a computing ghetto, about which Seymour Papert wrote a few years ago. That is why this phenomenon should be recognized as one of the important factors impeding access to internet workshops for a wider group of teachers.

A considerable part of the respondents (30.87% of the IT teachers and 27.0% of the teachers of other subjects) indicated participants of the courses within the scheme: "The Internet for Each Borough" to be eligible to conduct lessons in the workshop. Therefore, they indirectly evaluated the courses, in which almost 10,000 teachers took part. Organizing other courses, one should pay attention to their

didactic and organizational output. The statistics presented in Table 14 show that the significant majority of the teachers see the need for being prepared for using internet workshops.

Among the answers defined as "others", several most characteristic ones and, at the same time, most frequently listed, are worth mentioning. They are "vice-headmasters", "all computer-literate teachers", "only teachers who finished postgraduate studies". The choice of answers is dictated by the subjects' computing preparation and their post and function in the school.

Table 14: The Evaluation of Teachers Eligible to Conduct Lessons in Internet Workshops

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	all teachers	122	18.02	616	34.01
2.	teachers attending the course within the scheme "The Internet for Each Borough"	209	30.87	489	27.0
3.	custodians	278	41.06	580	32.03
4.	others	27	3.99	35	1.93
5.	no answer	41	6.06	91	5.03
Total		**677**		**1811**	

At the analysis of the educational and didactic changes, the fundamental issue was to define whether teachers of other subjects conduct their lessons in the internet workshop. The respondents' answers are presented in Table 15. They show that 72.02% of the teachers do not use computers during their lessons. If we take into consideration 16% of the teachers who did not answer this question at all, we may assume that this group is much bigger. This situation is worrying. That means that teachers having basic computing skills do not try to use them during lessons. The reasons for such a situation may be different. One of them is a lack of methodology competence, just compare results of both Tables 4 and 15. 55.49% of the teachers of other subjects (cf. Table 4) never use computers in school. If we compare this percentage with the number of "no" answers in Table 15, one should notice the difference of 24%. It indicates that some part of the teachers use internet workshops for preparing for the lesson (e. g. compiling material, searching for information, etc.). Other teachers either are not methodologically competent or are scared of novelty or equipment failure. Old tested methods are safer for them. Taking into consideration the variety of reasons for which teachers do not use computers during lessons, they were asked to define them.

Table 15: Conducting Lessons of Other Subjects in Internet Workshops

Entry No	Answers	No of other teachers' answers	%
1.	yes	91	5.02
2.	no	1431	79.02
3.	no answer	289	15.96
Total		**1811**	

In Table 16, there are the results of the answers given by the teachers about the reasons for which they do not conduct their lessons in internet workshops. Each of them could choose three reasons. The most important were: "only a custodian has access to the workshop" (46%), "lack of knowledge about Polish services connected with the subject" (38.98%), "lack of knowledge about methodological solutions connected with introducing new means, that is the Internet" (37%), "too much expense of internet connections" (30.98%).

The fact that only a custodian has access to the school internet workshop is a very unfavourable phenomenon as far as popularizing of information technology in school is concerned. Indicating this barrier by almost half of the teachers, signals that this phenomenon in school is common. Making IT teachers' (who are custodians) work easier is obvious. It happens with the acquiescence of headmasters, for whom such a practice is favourable, since it causes no organizational and technical problems.

A huge part of the teachers indicate their lack of methodological competence and weak knowledge about internet supplies connected with using computers in their subjects. Indicating those problems by one third of the teachers signals that teachers' schooling concern using computers during lessons too scantily. Signals observed during different occasions of the evaluation of the didactic process were confirmed in the research. They showed that teachers' computing schooling is focused too much on the matter of hardware, and that the whole process of information technology education is outdated. The shortcomings of knowledge conveyed to teachers in the domain of educational technology and multimedia education were also revealed. But these are the skills which determine final results in education. The fact that teachers themselves confirm their shortcomings in this domain is symptomatic. Without rapid changes in teachers' information technology education imposed by the Ministry of Education, methodological and educational advance in computing is not possible. The teachers' opinions on trust in knowledge and skills acquired during courses, compiled in Table 14, confirm that the teachers themselves evaluate their technical skills as scarcely good. The reasons for such a situation should be found in the technique of teachers' education. A good

example may be the syllabus of postgraduate studies for IT teachers, which is dominated by information technology, and methodology is a small part of it. That is why such standards of schooling, making teachers eligible to teach information technology in school, that include a sufficient number of didactics and media pedagogy classes should be introduced. It is high time we got rid of the stereotypes and magic of the name "information technology" and demanded qualifications in the didactic and educational domain. The school which brings up requires teachers with great pedagogical competence. Without changes in this domain, achieving goals of modern school will be impossible.

Table 16: The Reasons for Not Conducting Lessons in Internet Workshops by Teachers of Other Subjects

Entry No	Answers	No of answers of teachers of other subjects	%
1.	Only a custodian has access to the workshops	833	46
2.	The internet workshop is occupied with IT lessons	434	23.96
3.	Not knowing new technologies (usage of computers and the Internet)	380	20.98
4.	Not knowing methodological techniques connected with introduction of the new means – the Internet	670	37
5.	Fear of new technologies	163	9
6.	Not taking part in additional schooling, improving one's skills and educational background	54	2.98
7.	Too much expense of internet connections	561	30.98
8.	Not knowing Polish services connected with the teaching subject	706	38.98
9.	Others (define, please)	91	5.02

To sum up the reasons for which the teachers do not conduct lessons in internet workshops, one should pay attention to the answers defined as "others" in Table 16. Here are the most frequent ones: organizational problems, lack of educational programmes, no time during lesson – curriculum requirements, insufficient number of hours of the particular subjects, no need for using the workshop, compiling necessary material at home, too many students in the classroom, no division into groups. These answers accounted for only 5.02% of the total number, but their context is worth considering. It reveals great organizational difficulties connected with the introduction of internet workshops.

In Table 17, the results of the research concerning the frequency of using the Internet during lessons are presented. They let us show how often the teachers use

Table 17: The Frequency of Using the Internet during Lessons

Entry No	Answers	No of answers of IT teachers	%	No of answers of other teachers	%
1.	Every day	68	10.04	43	2.37
2.	Twice, three times a week	103	15.21	84	4.64
3.	Twice, three times a month	303	44.76	130	7.18
4.	Sporadically	36	5.32	197	10.88
5.	Never	20	2.95	1005	55.49
6.	Write how often, please	24	3.55	115	6.35
7.	No answer	123	18.17	237	13.09
Total		**677**		**1811**	

workshops during lessons, and compare the statistics with the one from Table 4, presenting the usage of internet workshops for all didactic aims. Analysing the results from Table 17 one may observe that a small number of the teachers use the workshop every day, regardless of the teaching subject. The usage of the workshop comes up to a few per cent (IT teachers 5%, others 1%). This data shows that everyday usage of internet workshops accounts for approximately a half of all didactic actions (cf. Table 4). It is not impressive, if we take into consideration all the possibilities provided by the Internet in teaching e. g. information technology. The teachers most frequently use the workshop during the lesson twice, three times a month, or sporadically. That means that the capacity of internet workshops is not fully used. It is worrying, especially if we take into consideration making a point of improving IT teachers' competence, for whom the Internet is an important source of knowledge and practising computing skills.

Since such a small number of teachers belong to the group who often use the Internet during lessons, the question arises about the reasons for such a situation. The results concerning the factors determining the usage of the Internet for teaching individual subjects in school are compiled in Table 18. Each of the teachers could choose four reasons from the list or could give their own ones. Not all of the teachers took the opportunity of doing so. Many of them chose only one or two reasons. The most frequently ticked factor determining the usage of the Internet by teachers was perceiving it to be a modern, extensive and up-to-date source of knowledge. Up to 84.05% of the IT teachers and 65.76% of other teachers indicated that factor. The similar percentage of non-IT teachers indicated, as the second one, improvement of one's professional skills and competence (64.99%).

As the second factor, the IT teachers indicated attractiveness and effectiveness of the educational process (76.96%). Analysing the teachers' answers, one may observe that a relatively small number of the IT teachers are interested in new computing technologies in education. This factor was ticked by only 22.01% of the IT teachers and 12.98% of other teachers. It is surprising, that only 28.95% of the IT teachers consider introduction of modern didactic aids and methodological techniques to be an important factor determining the usage of the Internet in school. Twice as many (41.97%) teachers of other subjects chose this factor as determining the usage of the Internet for teaching their subjects. The similar ratio of answers concerns the factor "improvement of one's professional skills and competence". The non-IT teachers using the Internet take into consideration the didactic factors, which complete their pedagogical competence, e. g. improvement of one's professional skills and competence, readiness to introduce an attractive didactic aid during the lesson, searching for new sources of knowledge, new methodological techniques. (cf. Table 13). The results show that the vast majority of the teachers declare their interest in the Internet as the source of methodological knowledge. This declaration is in contradiction to the previous results. That is why one should assume that the ticked factors are a consequence of the opinion commonly spread by the mass media. Indicating the above factors is very tasteful. No matter what the basis of the opinions is, such beliefs create good prospects for the success of the future schooling actions in the domain of methodology.

A separate group of factors which should be analysed are parents' proposals and students' pressure. The students' influence on the educational process, indicated by the IT teachers, is not a new phenomenon, but its scale has been unprecedented in Polish school so far. Even four years ago, in 1998, scarcely 2% of teachers indicated students' pressure on using the Internet by them. Today, the result is thirteen times higher (16.4%). Definitely much parental pressure is observed in the cities (26.8%), whereas pressure in the country is slight (approximately 6%).

Table 18: The Factors Determining the Usage of the Internet during Lessons

Entry No	Answers	No of answers of IT teachers	%	No of answers of other teachers	%
1.	interest in new computing technologies in education	149	22.01	235	12.98
2.	readiness to introduce modern didactic aids and methodological techniques	196	28.95	760	41.97
3.	improvement of one's professional background	280	41.35	1177	64.99

Entry No	Answers	No of answers of IT teachers	%	No of answers of other teachers	%
4.	attractiveness and effectiveness of the educational process	521	76.96	1210	66.81
5.	perceiving the Internet as a modern, extensive, and up-to-date source of knowledge	569	84.05	1191	65.76
6.	searching for new sources of knowledge	156	23.04	831	45.89
7.	students' pressure	111	16.40	172	9.5
8.	parents' proposals	54	7.98	21	1.16
9.	others (define, please)			189	10,44
10.	no answer	6	0,89	14	0,77

C) Barriers

Analysing the influence of mass introduction of computers into schools on the organizational, educational and didactic changes, different difficulties and barriers are clearly revealed. Among many of them we can distinguish: technically-communicative, cultural and intellectual ones.

Analysing the process of mass introduction of computers, it is obvious that a technically-communicative barrier is a significant factor limiting the usage of internet workshops in schools. It is understandable as practical barriers are always present in the introduction of new didactic aids into the process of education. The problem is they have varied resistance. The resistance determines whether the aid will be introduced and assimilated quickly, or its implementation will be long and ineffective; or it may not be introduced at all. The research showed that many teachers had difficulties with the access to the workshop, which influenced the limitation of introducing computers into the educational process. I described this matter during the analysis of the influence of mass introduction of internet workshops into schools (cf. items A&B of this article). The problem of the development of internet workshops is worth mentioning. One may observe the teachers' relatively small interest in this problem. On the one hand, it is a result of scarce activity of the IT teachers expecting actions from outside, on the other, the small interest of administrative authorities makes the majority of the teachers take an expectant stand.

The second important barrier is the cultural sphere. The way of functioning in the teaching environment, its habits, the way of thinking and acting determine the level of the assimilation of new technological solutions in the process of education. This problem has a great significance for the absorption of internet workshops by the environment. The teachers mainly concentrate on hardware. The cult of tech-

nology was created. As a consequence, methodological and educational skills, very useful from the educational point of view, are in the background. This technological cultural model has its roots in memory didactics, commonly functioning in school. Teachers concentrate on verbal communication, engaging mainly the memory sphere. As a result, passive methods, preferring the algorithmic structure are still the most convenient ones. This cultural model, generally present in school, is transmitted to information technology. The occurrence of internet workshops does not change this model, on the contrary, it strengthens it, because information technology is highly formalized. What is the trump-card in the scientific sphere of information technology is disadvantageous in education. Literal transmission of models from the scientific domain: information technology means decreasing the educational results in school. The only solution changing this situation is introducing multimedia education into the IT subject in schools. Otherwise, according to the research results, spending such a big outlay on internet workshops in school is uneconomical. Teaching the computing ABC may be done much more cheaply within the courses.

One should remember that the aim of teaching information technology is not the usage of the computer, but preparation for entering the world of the media, in which telecommunication and computing hardware is dominant.

If we understand the aim of mass introduction of internet workshops in schools in the above way, we should urgently change the curriculum of information technology by adding multimedia education, methodology, and the organizational aspect of teachers' educational system.

The third group are intellectual factors. The knowledge and skills of information processing influence the decisions of taking up intellectual actions. They are an important motivating factor. Understanding the civilization changes e. g. creating informative societies, understanding the need for the introduction of computers into the educational process, and knowledge of the ways of computer usage in schools influences the decisions and intensifies the motivation for acting. Analysing the research results presented in this chapter, teachers' scarce actions in support of students' intellectual development are clearly seen. There are no methodological solutions showing the way of students' stimulation for creative actions. The techniques of creative thinking are commonly unknown to the teachers. Scarce actions taken up by the teachers confirm this rule. Among the primary reasons, several should be distinguished: the dominance of traditional didactics in IT methodology, stereotypes fixed among teachers concerning different didactic solutions, the curriculum of information technology based not on the goals of the reform but on traditional didactic solutions coming from the period before the introduction of information technology into schools.

D) Changes in the organization of the headmaster's work

During the research, the headmasters' engagement in the development of internet workshops received within the schemes: "The Internet in Each Borough" and "The Internet for Junior High Schools" was analysed. Even a superficial analysis of the results compiled in Table 19 signals that the vast majority of the teachers (73.28%) indicated the headmasters' engagement in the development of internet workshops. The headmasters evaluated their engagement even higher (93.77%). The results are clearly optimistic as they mean the headmasters understand the need for modernization of internet workshops.

Table 19: Headmasters' Engagement in the Development of Internet Workshops

Entry No	Answers	Teachers		Headmasters	
		No	%	No	%
1.	Definitely yes	819	33.05	146	60.58
2.	Yes	997	40.23	80	33.19
3.	I don't know	217	8.76	4	1.66
4.	No	107	4.32	2	0.83
5.	Definitely no	57	2.3		0
6.	No answer	281	11.34	9	3.74
Total		**2478**		**241**	

Because this part of the survey did not allow us to evaluate the range of development, during the research the actions taken up by the headmasters were analysed. The headmasters mainly concentrated on:

- equipping internet workshops with hardware and software (buying additional computers, scanners, printers, educational programmes), furniture, audio-visual equipment (a digital camera, video camera, projector etc.),
- buying literature,
- winning sponsors over,
- equipping the library, school administration with computers,
- making efforts to receive another internet workshop from borough authorities,
- creating borough website and asking the telecommunication company for cheaper internet connections.

The presented actions, taken up by the headmasters, got at making streamlined information technology structure in schools. It is worth mentioning that wherever parents were sponsors, there was their surveillance over the quality of the bought equipment. This fact was highlighted both by the headmasters and the teachers.

Taking into consideration the awakening of parents' interest in internet workshops, wider usage of this potential in the development of the workshops is worth considering.

Using internet workshops by the local government in the process of regional development; the government's expectations towards the workshops

In this part of the research, the questions: How are internet workshops used by the local government in the process of regional development?; What are their expectations towards the workshops?, were to be answered.

The research was carried out in two spheres. The first one concerned the scale and kinds of services, connected with the Internet, made by teachers. The second one, concerned the possibilities of using internet workshops by the local government.

The teachers' answers about the services done by them in support of the borough are compiled in Table 20. Over half of the teachers (58.76%) indicated that they rendered services connected with the Internet to the borough. Therefore, we can say that one of the basic aims of the schemes: "The Internet in Each Borough" and "The Internet for Junior High Schools" was accomplished satisfactorily. The choice of the answer "I don't know" by every tenth teacher (12.35%) indicates not understanding this problem. That means that some teachers acting in support of the borough do not publicize their credit or they are not interested in this matter.

Table 20: Teachers' Services Connected with the Internet Rendered to the Borough

Entry No	Answers	No	%
1.	Yes	1456	58.76
2.	No	669	27.00
3.	I don't know	306	12.35
4.	No answer	47	1.90
Total		**2478**	

Table 21 presents the types of services done by the teachers in support of the borough. Web pages were made most frequently. This service was indicated by 48.47% of the teachers. The teachers, much infrequently, did schooling services for borough workers (10.73%) and, together with them, took part in the improvement

of their professional background (14.69%). The service for the inhabitants of boroughs also had a very small range (6.29%). The teachers' service in support of boroughs in the domain of searching for information for the local government and borough administration is small, as well. One should remember that, as a result of the initiative coming from the Interclass, 250 Borough Centres of European Information were established all over the country, and 400 more will have been finished by 2002. The information about the European Union and about our accession to the Union, provided by these centres, is of great significance, not only for schools but also for the local government, businessmen and farmers. That is why, the school's cooperation with the borough administration and government in the domain of information transmission with the usage of internet workshops should be considered to be highly insufficient.

Table 21: The Types of Teachers' Services Rendered in Support of the Borough

Entry No	Answers	No	%
1.	Borough workers' schooling in the domain of using the Internet	266	10.73
2.	Making web pages for the borough	1201	48.47
3.	Making internet workshops accessible for theinhabitants of the borough	156	6.29
4.	Searching for necessary information	106	4.28
5.	Mutual improvement of professional background	364	14.69
6.	Others	81	3.27
7.	No answer	304	12.27
Total		**2478**	

The possibilities of the internet workshop which might be useful for the government, borough administration, and local society were to be defined during the research. 1017 teachers responded to this topic (41.04% of all the participants). The answers were divided into several groups, according to the theme. Among the waste possibilities, the teachers most frequently indicated:

- wider access to internet workshops for the inhabitants of the borough in the afternoons; the expenses connected with using the workshops (internet connections, service) should be covered by the borough's budget or by the inhabitants, and extra income should be left in schools;
- making web pages with a view to exchanging information with partner boroughs, cities; it would make the economic, educational and social relations with both partner cities and boroughs easier;

- improving the knowledge and skills of local society in the general, cultural, professional and technological domain; it has particular significance in small towns and the country;
- conducting open lessons for teachers;
- wide access to internet workshops in the afternoons;
- organizing computing circles;
- organizing IT courses for the local government, borough administration, and society;
- conducting schooling for the unemployed, willing to qualify for a new job, and looking for a job;
- making weekend continuing schooling in schools.

Presented waste possibilities signal a lot of potential, which exists in terms of the wider usage of internet workshops. The problem of insufficient cooperation between the school and borough is clearly revealed. Among the reasons for such a situation the following should be distinguished:

- no funds for salaries for teachers conducting courses for the inhabitants of the borough,
- the problem of school work organization connected with the usage of the workshop by others (apart from a custodian),
- no teachers' and headmasters' interest because of the burden caused by taking up additional work,
- fear of the quicker use up of equipment and lack of funds for its repair
- no proper legal regulations opening school for outside,
- uncertainty of school initiative success in this matter,
- technical problems resulting from the differences of hardware platforms and software between the local government and school,
- the cultural models functioning in teaching environment, e. g. the idea that only students learn in school,
- indifference, very often not revealed, the symptom of which is passivity.

The factors determining teachers' candidacy for additional schooling; using knowledge and skills in practice

The schemes: "The Internet in Each Borough" and "The Internet for Junior High Schools" stipulated directing tipped teachers for IT courses. Within the scheme: "The Internet for Each Borough", three teachers were directed from each borough for courses A (ABC of using a computer), B (ABC of using the Internet), C (methodology of using the Internet in schools), one teacher for course D (a workshop

custodian), and one for postgraduate studies in information technology. Since the scheme involved all the boroughs in Poland (2500), 7500 teachers of different subjects were educated in courses A, B and C, and 2500 teachers-custodians.

In this part of the research two basic questions were to be answered: What factors determine teachers' candidacy for additional schooling?, How are their knowledge and skills used in practice?

The factors determining teachers' candidacy for additional schooling were compiled in Table 22.

Table 22: The Factors Determining Teachers' Candidacy for Courses A, B, C, D

Entry No	Answers	No	%
1.	I volunteered	370	18.78
2.	I was tipped randomly	489	24.82
3.	I was tipped deliberately because: – I was computer-literate – I was to conduct IT lessons – I had didactic achievements – I taught sciences – I taught arts subjects – I lacked obligatory teaching hours of my subject – I cooperated with the headmaster over the modernization of the school	839 534 830 115 331 77 576 61	42.59 27.11 42.13 5.84 16.80 3.91 29.24 3.10
4.	I was tipped by the educational administration	81	4.11
5.	I was tipped by the administration of the borough	37	1.88
6.	I don't know the reason	154	7.82
Total		**1979**	

Note: The teachers could choose several answers in item 3.

Even a superficial analysis shows that the vast majority of the teachers (42.59%) were appointed for the courses deliberately. However, the fact that almost one fourth (24.82%) of the teachers were appointed randomly is surprising. That means, on the one hand, applying bureaucratic automatism during recruitment, on the other, the possibility of opportunistic behaviour among teachers and an aversion to the change of duties they have had in schools so far. Partially, a relatively small group of the teachers who volunteered for the courses (18.78%) confirms the above thesis. Out of the group of the teachers who were appointed deliberately the biggest group were IT teachers-to-be; they also took part in course D – workshop custodians. Choosing the teachers for the courses, their computing skills were also very important, whereas

the didactic achievements (5.84%) and cooperation with headmasters over the modernization of the school (3.10%) had marginal significance.

The results presented in Table 21 indicate the variety of criteria of teachers' selection for computing schooling. Headmasters a crucial influence of schools and insignificant local government had.

In Table 23, the results of the research concerning the usage of the knowledge acquired during courses A, B, C were presented. In view of the fact that some teachers use the Internet for their own needs, such an option was also included during the research.

Table 23: Using Knowledge Acquired during Courses for the Work with the Internet

Entry No	Answers	No of answers of IT teachers	%	No of answers of other teachers	%
1.	For one's own work	365	53.91	585	32.30
2.	I don't use this knowledge	247	36.48	982	54.22
3.	No answer	65	9.60	244	13.47
Total		**677**		**1811**	
4.	For conducting lessons of respective subjects	448	66.17	214	11.82
5.	I don't use this knowledge		11.00		55.00
6.	No answer		23.00	58	33.72
Total		**677**		**1811**	

The knowledge acquired during the courses is used by the IT teachers more widely (66.17%) than by the teachers of other subjects (11.82%). It is obvious if taking into account the results presented above concerning the teachers' access to internet workshops. Comparing the results from Table 1 and Table 23, a significant difference between the IT teachers' answers declaring the usage of the Internet in the educational process (96.45%) and the knowledge acquired during the courses used by them (66.17%) was observed. It shows partial usage of the knowledge and skills acquired during schooling. Such a difference is also present in the comparison of the usage of the Internet for one's own needs (cf. Table 3) and the usage of the knowledge from the courses. The teachers of other subjects, on the one hand, declare the usage of the Internet for their own needs (64%), on the other, only 32.3% of the teachers declare the usage of the knowledge from the courses for working with the Internet. These discrepancies, on the one hand, show the teachers' self-improvement as far as the Internet is concerned, on the other, the discord of the knowledge and skills conveyed during the courses in comparison with the practical needs occurring in the school. One of such needs is a lack of sufficient

competence in the domain of multimedia education and modern methodological solutions, which was signalled earlier by me.

Finally, the evaluation of the courses made by their participants is worth mentioning. The results of the evaluation are presented in Table 24. Generally, computing skills in the domain of the usage of the Internet acquired during the courses were evaluated quite well. Both the IT teachers and the teachers of other subjects indicated that those courses let them extend their computing knowledge and skills. They indicated that mastering of the usage of the Internet seemed to be the most important matter during the courses. However, after coming back to work, the vast majority of the teachers, confronting their knowledge with practice, noticed significant gaps, especially in the educational competence. It was mainly the result of the fact that 4.87% of the IT teachers and 13.58% of the teachers of other subjects could not estimate whether they acquired the skills or not.

Table 24: The Evaluation of Computing Skills Acquired during the Courses in the Domain of the Usage of the Internet

Entry No	Answers	No of IT teachers	%	No of other teachers	%
1.	Definitely yes	204	30.13	311	17.17
2.	Yes	329	48.60	586	32.36
3.	No	72	10.64	163	9.00
4.	Definitely no	16	2.36	106	5.85
5.	I don't know	23	3.40	399	22.03
6.	No answer	33	4.87	346	13.58
Total		**677**		**1811**	

Among the schooling firms that carried out the courses, OSI CompuTrain was evaluated to be the best one. Over 84% of the participants of these courses rated them very well. Other schooling centres were evaluated by the teachers within 52–64%.

The influence of internet workshops on the standard of information technology and other subjects teaching in primary schools and junior high schools

During the research, the influence of internet workshops on the standard of information technology and other subjects teaching in primary schools and junior high schools was defined. The teachers' opinions on the types of computing goals implemented in the workshop and useful in lower-primary school were analysed.

The IT teachers listed the following goals most frequently: entertaining and educational games (81%), using multimedia educational programmes, encyclopaedias (41%), learning of the usage of the Internet (79%), learning of word processors (66%), learning of graphics processors (68%), learning of work with the operating systems (69%), learning of spreadsheets (25%), learning of databases (23%).

The teachers of other subjects highlighted different aims: using multimedia educational programmes, encyclopaedias (36%), other educational games (54%), other programmes, e. g. creating animation (46%), graphics processors (46%), entertaining and educational games (62%), word processors (43%), learning of work with the operating systems (57%).

The results presented in Table 25 show that the IT teachers put emphasis on the implementation of aims including the usage of a computer. They assume that the mastering of hardware will make other spheres of information technology accessible for students e. g. the domain of informative culture. Accepting such an assumption determines in advance the way of implementing the didactic process, which is algorithmic. Achieving the aims connected with the usage of a computer and the programmes of the office package is undoubtedly advantageous. Unfortunately, it is not the essence of transmission in the domain of information technology in lower-primary school. Learning how to use a computer has to be slotted in the implementation of aims of this learning. That means the introduction of information technology into the educational process on the basis of lower-primary school, and not the other way round. Separating information technology from the educational process in lower-primary school, observed in the educational practice, leads to putting an emphasis on technology, which is contradictory to the goals of school at this stage. It also leads to warping the idea of using computers in lower-primary school. If we assume that the aim of information technology in school is the usage of a computer only, there is no need, then, to bear such great expenses of mass introduction of computers into schools. This aim may be achieved, e. g. during courses, it will be much cheaper for the national budget. One should assume that the modern idea of introducing the computer into the educational process is aimed at more important goals than the mere usage of the computer. Information technology should be used for implementation of the main aim of a school, ie a child's comprehensive development. It requires a modern IT curriculum destined for both students and teachers. The results of the research presented in Table 25 indicate that in the future schemes of the computerization of school, additional courses for teachers should be introduced, showing them how to organize the educational process, in which learning of usage will be included in the educational process in lower-primary school.

Analysing the results compiled in Table 25, a big group of teachers (81% of the IT teachers and 62% of the teachers of other subjects) indicating the usage of computer games in education, is worth mentioning. The idea of using games for implementing the aims of education in lower-primary school should be recognized as a good one. Children learn by playing eagerly, that is why in the research attention was paid not only to the usage of computer games but also to their kinds. The vast majority of teachers indicated games which are both interesting for students and available in school. After a careful survey of the types of games indicated by the teachers, one may observe certain regularity, common to all the teachers:

- games indicated most frequently: adventure (traditional, RP 6 – role playing, MUD – multi user dungeon), tending to develop dexterity (shooting and fireworks, platform, combat games, and arcanoids), strategic, and martial;
- intellectual games were indicated least frequently, e. g. logical;
- very often the choice of games was random;
- faith in great possibilities of computer games in education.

The above – mentioned regularity indicate the teachers' distinct lack of orientation in the games available on the computer market. At the same time, there are no cheap educational games in schools. Regulations, making the stimulation of Polish educational computer game market possible, should be prepared by the Ministry of Education.

Analysing the results in Table 25, it may be observed that animation and simulation programmes are scarcely used in lower-primary school. The lack of teachers' interest in them indicates the need for taking up some educational actions in this domain. Further maintaining of such a situation will perpetuate learning of the usage of a computer, and delay modernization of the educational process in the domain of information technology.

In Table 26, the teachers' opinions on the types of computing aims implemented in internet workshops useful in upper-primary school are presented. The IT teachers most frequently listed: learning of work with operating systems (97%), learning of word processors (94%, learning of the usage of the Internet (93%), learning of the language of programming (91%), learning of spreadsheets (89%), using multimedia educational programmes and encyclopaedias (74%), entertaining and educational games (88%), and learning of databases (72%).

The presented results, as far as the teachers' opinions are concerned, are similar to the ones concerning the lower-primary school, but even more distinct. The teachers prefer technological aims, ie the techniques of the usage of a computer and the office package. There is one significant difference – the vast majority of the IT teachers (91%) and one-third of the teachers of other subjects (33%), indicate learning of the language of programming. There would not be anything

Table 25: The Teachers' Opinions on the Types of Computing Aims Implemented in Internet Workshops Useful in Lower-Primary School

Answers	Implemented aims		The most important implemented aims	
	IT teachers	Teachers of other subjects	IT teachers	Teachers of other subjects
learning of work with the operating systems	69%	57%	55%	33%
learning of word processors	66%	43%	59%	35%
learning of graphics processors	68%	46%	53%	37%
learning of spreadsheets	25%	3%	7%	0%
learning of databases	23%	11%	4%	0%
learning of the language of programming	0,6%	6%	0%	3%
learning of the usage of the Internet	79%	25%	75%	23%
using multimedia educational programmes, encyclopaedias	41%	36%	33%	32%
entertaining and educational games	81%	62%	73%	53%
other educational games	0,6%	4%	0,6%	1%
other programmes e. g. creating animation	2%	6%	1,5%	3%
I have no opinion	24%	39%	16%	11%

strange in it, if Logo Comenius were taught.[3] In 1980, S. Papert proved that even the original version of this language develops intellectual skills. Meanwhile, over 87% of the teachers indicate the Pascal language to be the aim of subject lessons. Such a standpoint was criticized in 1996 by R. Tadeusiewicz in the article: "To teach information technology – but how?" published in Culture and Education. He posed the question: What is the sense in teaching programming to all students, since hardly anybody will be able to use this knowledge in practice? His words, expressed many years ago, are still up-to-date. Nowadays, after six years, teachers' persistence in the belief that the language of Turbo Pascal is needed is worrying. The results show that preparation of IT teachers at universities perpetuates the patterns which are disadvantageous for Polish education.

[3] Advantages of this language are presented by A. Skarbińska (2001): *Multimedia w Logo Komeniuszu*, Multimedialna Biblioteka Pedagogiczna: A. Marszałek.

Table 26: The Teachers' Opinions on the Types of Computing Aims Implemented in Internet Workshops Useful in Upper-Primary School

Answers	Implemented aims		The most important implemented aims	
	IT teachers	Teachers of other subjects	IT teachers	Teachers of other subjects
learning of work with the operating systems	97%	85%	22%	13%
learning of word processors	94%	49%	54%	31%
learning of graphics processors	85%	43%	32%	19%
learning of spreadsheets	89%	22%	12%	6%
learning of databases	72%	21%	6%	3%
learning of the language of programming	91%	33%	2%	1%
learning of the usage of the Internet	93%	77%	19%	11%
using multimedia educational programmes, encyclopaedias	74%	63%	29%	17%
entertaining and educational games	88%	76%	59%	45%
other educational games	12%	15%	0%	0%
other programmes e. g. creating animation	4%	7%	0%	0%
I have no opinion	2%	9%	1%	0.6%

There is a necessity to make handbooks for teachers in the electronic version, which would make learning of the usage of a computer in a simple way possible and would show the possibilities of modern software. Instead of teaching the language of programming, it is more profitable to introduce programmes developing imagination, creativity, and others. It has particular significance for the educational process in primary school.

Analysing the data compiled in Table 27, it may be easily observed that the teachers' opinions on different types of aims implemented in internet workshops useful in junior high schools are similar to their opinions on aims in upper-primary school. The correspondence of the teachers' opinions on the usage of the Internet is worth noticing. The courses carried out within the schemes: "The Internet in Each Borough" and "The Internet for Junior High Schools" have produced the expected results. The majority of the teachers understood the significance of the computer net for education, therefore, one should concede that the courses carried out by different centres were successful.

Because the usage of the Internet may be accompanied by different aims, the types of aims implemented in internet workshops in the domain of the Internet usage were analysed during the research. In Table 28 the aims of lower-primary

Table 27: The Teachers' Opinions on the Types of Computing Aims Implemented in Internet Workshops Useful in Junior High Schools

Answers	Implemented aims		The most important implemented aims	
	IT teachers	Teachers of other subjects	IT teachers	Teachers of other subjects
learning of work with the operating systems	100%	21%	96%	25%
learning of word processors	100%	38%	92%	42%
learning of graphics processors	98%	31%	90%	31%
learning of spreadsheets	100%	28%	98%	12%
learning of databases	98%	18%	91%	16%
learning of the language of programming	98%	12%	95%	9%
learning of the usage of the Internet	100%	93%	99%	99%
using multimedia educational programmes, encyclopaedias	89%	68%	86%	53%
entertaining and educational games	75%	56%	71%	23%
other educational games	14%	7%	5%	4%
other programmes, e. g. creating animation	6%	5%	3%	2%
I have no opinion	1%	2%	3%	1%

school, for the implementation of which the Internet was used, were presented. The results compiled in this table show that the Internet is scarcely used for the implementation of the aims of lower-primary school. The IT teachers most frequently use the web browser (11%) and e-mail (12%).

A different situation takes place as far as upper-primary school is concerned. The aims listed by the IT teachers as most frequently implemented in internet workshops and connected with the Internet usage, were

- searching for information in the net (48%),
- using the web browser (44%),
- using e-mail (43%),

The teachers of other subjects had similar preferences, but much lower in number. The following aims were most popular:

- searching for information in the net (40%),
- using e-mail (33%),
- using the web browser (23%).

The fact that a large group of the teachers consider searching for information to be an important aim is very optimistic as it means that the teachers understand

Table 28: The Types of Aims of Lower-Primary School Implemented in Internet Workshops in the Domain of the Internet Usage

Answers	Implemented aims		The most important implemented aims	
	IT teachers	Teachers of other subjects	IT teachers	Teachers of other subjects
Using the web browser	11%	7%	10%	4%
Using e-mail	12%	4%	4%	1%
Participation in newsgroups	2%	0.58%	1%	0.58%
Using the programmes for communication in actual time e. g. IRC, NetMeeting	1%	0.58%	1%	0.58%
Conducting videoconferences	0%	0%	0%	0%
Searching for information in the net	9%	8%	5%	2%
Edition of web pages	10%	7%	5%	3%
Accessing files from the net (graphics, programmes)	9%	5%	7%	2%
Others	1%	0.58%	0%	0%

Table 29: The Types of Aims of Upper-Primary School Implemented in Internet Workshops in the Domain of the Internet Usage

Answers	Implemented aims		The most important implemented aims	
	IT teachers	Teachers of other subjects	IT teachers	Teachers of other subjects
Using the web browser	44%	23%	10%	27%
Using e-mail	43%	33%	38%	26%
Participation in newsgroups	17%	12%	7%	7%
Using the programmes for communication in actual time e. g. IRC,	21%	12%	11%	4%
NetMeeting	4%	3%	1%	1%
Conducting videoconferences	3%	1%	1%	0.5%
Searching for information in the net	48%	40%	37%	20%
Edition of web pages	37%	24%	13%	11%
Accessing files from the net (graphics, programmes)	27%	51%	15%	12%
Others	4%	1.7%	0%	0%

the significance of the overriding aim of school, which is improving the skill of searching for information.

Table 30: The Types of Aims of Junior High Schools Implemented in Internet Workshops in the Domain of the Internet Usage

Answers	Implemented aims		The most important implemented aims	
	IT teachers	Teachers of other subjects	IT teachers	Teachers of other subjects
Using the web browser	44%	23%	10%	27%
Using e-mail	43%	33%	38%	26%
Participation in newsgroups	17%	12%	7%	7%
Using the programmes for communication in actual time e. g. IRC,	21%	12%	11%	4%
NetMeeting	4%	3%	1%	1%
Conducting videoconferences	3%	1%	1%	0.5%
Searching for information in the net	48%	40%	37%	20%
Edition of web pages	37%	24%	13%	11%
Accessing files from the net (graphics, programmes..)	27%	51%	15%	12%
Others	4%	1.7%	0%	0%

Analysing the results compiled in Tables 29 and 30, one may observe similar tendencies in lower-primary school, but even more prominent. The teachers understand the possibilities provided by the Internet in school work. Understanding the significance of acquiring in school the skills of searching for information is an important achievement of the schemes: "The Internet in Each Borough" and "The Internet for Junior High Schools". Unfortunately, this is the end of optimistic results of the research because asking the question about the ways of improving the skill of searching for information, one may observe that over 70% of the teachers indicated the technical usage of the Internet, and only 22% could list the method of F. V. Winkworth, M. Marland, or the method recommended by the National Council of Educational Technology in Great Britain (cf. B. Siemieniecki 1997, p. 200). The discord between the teachers' declarations and willingness and their methodological knowledge is the reason for paying proper attention to the didactics of improving computing skills during courses. It requires a radical change of the construction of future courses and putting more emphasis on the didactic methods.

Using the supplies of computer nets for the implementation of the reformed curriculum

In another part of the research, the teachers were asked about their knowledge of the educational servers connected with the subjects they taught. The vast majority of the IT teachers declared knowledge of the servers, while a considerably lower result was achieved by the teachers of other subjects (47%). The teachers were also asked to give the addresses of the servers connected with their subjects. The answers were given by 72% of them. Each of the teachers could list three names of the servers. Not all of them used that possibility. Almost half of them listed one or two servers at the most. The results are presented in Table 32.

Table 32: The Teachers' Knowledge of the Names of the Educational Servers Connected with the Subjects They Teach

Entry No	Answers	No of answers of IT teachers	%	No of answers of other teachers	%
1.	yes		68		47
2.	no		9		16
3.	no answer		23		37
Total		**677**		**1811**	

The teachers listed server www.edussek.pl most frequently. An interesting fact is that some teachers, who did not answer the question about their knowledge of the educational servers connected with their subjects listed specific names in the next question. It suggests that some answers were given randomly. The teachers listed the names they remembered.

Table 32: The Addresses of the Educational Servers Connected with Different Subjects Listed by the Teachers

Entry No	The name of the server	%
1.	www.edussek.pl	21
2.	www.wsip.com.pl	9.6
3.	www.interklasa	9
4.	www.szkoly.edu.pl	8
5.	www.interszkola.pl	6
6.	www.gimnazjum.pl	5

Entry No	The name of the server	%
7.	www.men.waw	4
8.	www.profesor.pl	4
9.	www.republka.pl	2
10.	www.edu.pl	2
11.	www.oswiata.pl	2
12.	www.szkla.net.pl	2
13.	www.edukacja.torun.pl	2
14.	others	23.4
15.	no answer	28

The influence of internet workshops on the development of creative intellectual activity

The influence of internet workshops on the development of students' creative intellectual activity was evaluated by the teachers at three levels of education. In Table 33, the results of the teachers' opinions on this matter were presented. The data shows that their evaluation is rather low. The least influence was indicated in lower-primary school, the biggest in junior high schools. The fact that the teachers evaluated the influence of internet workshops on the intellectual development as very low indicates the need for introducing radical changes into the organization of the educational process and the process itself. The fact that only 23% of the teachers were able to list different techniques of creative thinking, is also worth mentioning. The weakness of the system of teacher schooling in Poland is shown. Too little emphasis is put on the improvement of skills of using the problematic methods in school in the curriculum of teacher studies.

Table 33: The Influence of Internet Workshops on the Development of Creative Activity

Entry No	The influence of internet workshops	Lower-Primary School	Upper-Primary School	Junior High School
1.	Definitely yes	5%	8%	11%
2.	Yes	7%	14%	19%
3.	I have no opinion	8%	10%	5%
4.	No	36%	27%	24%
5.	Definitely no	7%	9%	6%
6.	No answer	37%	32%	35%

Pathology as a result of the introduction of internet workshops into schools

Introducing a significant number of workshops into schools causes educational problems that have not been observed so far. I have described some of them in Chapter II and in this Chapter, in the part devoted to the changes in the domain of upbringing (cf. Table 13). Now, I will present the results concerning the teachers' replies to two questions. The first one concerns the internet services most frequently used by students, the second one, the reasons for which students use the programmes for communication in actual time e. g. IRC.

The services which in the teachers' opinion are the most frequently visited by students are compiled in Table 34. Each of the teachers had a possibility of choosing three services most frequently used by students. A significant part of the teachers did not answer this question (one fifth in junior high schools, one fourth in upper-primary school, one third in lower-primary school). During the interviews made with the teachers by way of other research, devoted to problems of pathology caused by information technology, the most frequent cause for not giving any answer were three reasons: lack of the teachers' orientation in actions taken up by students, the fear of creating a wrong image of teachers themselves and the school with which they identify, and a lack of interest in axiological problems.

Analysing the answers one might observe much regularity. The teachers indicated that whatever the level of education was, students most frequently use a servers with computer games, mp3 music and music bands. In the upper-primary school, the interest in pirate pages, programmes such as Big Brother, chat, and educational pages increases.

In the teachers' opinion, the longer students learn, the bigger their interest in servers thematically connected with their hobbies is (cf. Table 34).

Table 34: The Internet Services Visited (in the Teachers' Opinion) Most Frequently When Students Are Allowed to Work Freely

Entry No	Answers	Lower-primary curriculum	Upper-primary curriculum	Junior High School
1.	Services with mp3	12%	13%	33%
2.	Services with music bands	10%	20%	27%
3.	Educational servers	5%	19%	28%
4.	Servers with games	36%	47%	33%
5.	Servers thematically connected with students' interest, e. g. motorization	4%	23%	64%
6.	Chat	3%	11%	26%

Entry No	Answers	Lower-primary curriculum	Upper-primary curriculum	Junior High School
7.	Sport services	6%	14%	23%
8.	Pages with programmes such as Big Brother	9%	21%	38%
9.	Erotic servers	2%	7%	17%
10.	Film pages, with television programmes	3%	9%	16%
11.	The internet café	3%	6%	27%
12.	Hacker pages	3%	7%	18%
13.	Pirate pages	11%	18%	39%
14.	Others	13%	19%	24%
15.	No answer	32%	24%	21%

In Table 35, the percentage of the results of the research concerning the teachers' opinions on the reasons for using programmes for communication in actual time, e.g. IRC, by students was presented. The answer was given by almost 57% of the teachers. Similarly to the previous question (Table 34), this one was answered by a relatively small number of the teachers.

Definitely the most frequent reason indicated by the teachers was "willingness to meet people" (35% of the respondents).

Table 35: The Reasons for Which Students Use the Programmes for Communication in Actual Time e. g. IRC

Entry No	Reasons	%
1.	willingness to meet people	35%
2.	The possibility of free conversation, exchanging opinions	19%
3.	Anonymity	16%
4.	Entertainment	9%
5.	An interesting form of contact with other people	7%
6.	It doesn't require truthfulness, the possibility of playing different roles	5%
7.	Developing one's interests	5%
8.	Elimination of shyness	2%
9.	The possibility of conversation with several people at the same time	1%
10.	Others	1%

To sum up, taking into consideration the results in Table 13, one may observe the teachers' relatively small interest in the problem of pathology. This phenomenon is observed both among the IT teachers and the computer-literate teachers of other subjects. There is no headmasters' interest in minimizing the dangers coming from information technology, either. The teachers' slight orientation in students' actions

during the usage of the computer net is worth consideration. They are more interested in a particular group of students who have a chance of participating in competitions and achieving success by the school and teacher.

Information technology in diagnostics and the pedagogical therapy

During the research, one tried to answer the question how information technology is used in diagnostics and the pedagogical therapy. The vast majority of the respondents did not answer the question at all or gave a negative answer. The teachers indicating the usage of information technology in school, listed "working with disabled people" (6%) and "diagnosing the educational results" (5%) most frequently. Analysing the data compiled in Table 35, one may easily see that information technology has not been used in school for diagnosing and the pedagogical therapy so far. The possibilities created by information technology are significant today (cf. B. Siemieniecki, 1996; B. Siemieniecki, J. Buczyńska, 2001; S. Juszczyk, W. Zając, 1997). The minimal usage of information technology in school should be recognized as disadvantageous. The mass introduction of information technology, especially in the country, is the essential requirement for the improvement of the educational results. Many therapeutic activities could be taken up in school without the necessity of directing children to distant psychological and pedagogical centres.

Table 36: Using Information Technology in Diagnostics and the Pedagogical Therapy

Entry No	Answers	%
1.	Diagnosing the educational results	5%
2.	Using in therapy of dyslexic children	2%
3.	Using in speech therapy	1.5%
4.	Improving one's self-evaluation	2%
5.	Diagnosing different deficits among children	4%
6.	Working with disabled people	6%
7.	No answer or not using information technology in education	79.5%

Conclusion

The study was made as part of diagnostic and also prognostic research. Studies diagnosed the existing state after the two following study programmes: "Internet for small counties" and "Internet for High School students ". The presented research results have a meaning in both theory and research. The meaning of those studies is a result of the fact that there is an essential difference between the Polish process of information technology introduction to schools and realizing the same goals by the European Union countries and the United States. It is connected with social – economic conditions and the scale of the process. Here we deal with a lot of reforms at the same time (including one in education), and, on the other hand, with quick changes in world civilization (caused by enormous development in technology, etc.).

The introduction of computers in schools on a mass scale caused changes in popularization of information technology in urban and rural environments. It drew the environments' attention to technology and its role in the modern world. The introduction of computers showed an increase in society interest in the need for introducing information technology to schools and also broke many barriers in schools, for example: teachers' and headmasters' fear of the usage of the technological workshop in the functioning of the school. The interest of the teacher environment in the use information technology for organization and didactic studies has increased.

All secondary schools have programmes in the field of information technology, which has brought us closer to the countries of Western Europe. It has given our generation a chance to join the growing competition field of our better developed neighbours

Every county has obtained a computer shop, which has created a network of schools that have all potential educational tools. Three teachers from every county took part in the training, and one teacher became the guardian of the group. The training was funded by the county government. The idea of the Ministry of Education and county authorities working together turned out to be very good. The computer workshops have been welcomed by the county authorities.

The programmes: "Internet for counties" and "Internet for High School students" have generally reached their goals. They have shortened the distance between Poland and the European Union. The studies have shown many occurrences and processes, in which we can include:

1. Excessive attention to preparing teachers for the use of IT tools. After introducing computer workshops to schools there were changes noticed in teachers' ability to use those tools. It showed a difference between the teachers of

computer connected subjects and the teachers of other subjects that took part in the training. The aspect of the Internet usage was less known by the teachers of other subjects.

2. Workshops played a slight role in accelerating the educational process. But they increased the dangers of modern technology. At the same time, the teachers showed little interest in pathologies caused by technology and its use to enrich the educational process.
3. The teachers who work with computer technology everyday had a very good opinion on the usage of computers in everyday teaching process and managing the school. It was not the same in the practical aspect of things.
4. Computer workshops are rarely used during school hours.
5. Introduction of computer workshops played a small role in the stimulation of creative activities.
6. After the large interest of teachers in the new computer labs when they were first created right now most of them are not interested in using them in their everyday work. That creates a dangerous appearance of isolating computer workshop from the life of the school.
7. The main part of the IT teachers rarely use the Internet, and one third of the teachers of other subjects do not use the Internet at all. It gives essential limits of using the computer technology in school. During the next period of time the teachers' computer knowledge can dramatically decrease and in consequence limit the abilities of using the Internet for teaching, educating and self-educating purposes.
8. Almost half of the studied computer teachers use the Internet once a month and over fifty percent of other teachers that have IT knowledge do not use the Internet at all.
9. There are a lot of myths that deal with getting high results in computer education. The following two are the most common ones. The first one is that computer games make quicker acquisition of IT abilities possible and, at the same time, give better results in education. The second myth tries to tell that when students are given time to research the Internet on their own, we develop their abilities of using the Internet tools and we shape their computer references. We are of the opinion that both myths are wrong. In the case of games, there is a lack of products on the Polish market which would guarantee the realization of the programme and develop the intellectual aspect of the student. That is why the use of games during the lesson should be very carefully planned.

Allowing the student to freely research the Internet makes them concentrate on information that is not important and can be even harmful from the schools' point

of view. The majority of students, due to their biologically set limits to process information, need boundaries in their work to slowly learn to work alone. Their rare usage of creative thinking methods in Polish schools and a lack of student training of independence needs taking active steps during IT lessons. Being able to make decisions, does not mean being able to work alone.

These are the steps that should be taken before the mass introduction of computers to schools. They will help to avoid anomalies.

1. When computers are introduced to schools at the same time humanities studies should be strengthened. Programme changes based on education changes should be made. If media and computer education is not connected together, a rise in the technocratic way of thinking in students may be expected, which will cause an even deeper pathology and cause more problems in schools. It will rise together with the grow of technology in schools. To avoid these mistakes media and computer programmes should be connected, creating a one-type education programme. This will improve the quality of work and create the ability to teach creative thinking to students.
2. The subject created from media and computer study programmes should be realized by the method of projects. Projects should favour creative thinking in students.
3. On a wider scale than up till now, teachers should be trained in the dangers of information technology, creating intellectual thinking and using a methodological process that would direct students in creating multimedia, and other projects that would allow students to work and concentrate on exiting projects.
4. The Ministry of Education should create a plan that would interest the authorities in systematic modernization of computer workshops.
5. There is a need to create systems that would guarantee availability of computers in after-school hours.
6. Polish database and virtual media library should be available to all students.
7. More research is necessary to determine the state of use of information technology in education.
8. Starting more research that deals with the family (intelligent home, wide availability of the net), in-depth work on pathologies dealing with information technology (work of a child with a computer, on the net computer phobias, computer games and all appliances that are connected to it, virtual view of the world, hackers, piracy, sex, etc).
9. To start work on virtual educational-pedagogical help desk. In the process of education in elementary school and high school computer programmes

should be introduced on a wide scale for diagnos and pedagogical treatment. First it should be used in integration classes in schools in small villages distant from big cities It should be expected that it will give a chance of development to childern that have been in a much worse situation until now.

10. In the case of using Pascal for programming in elementary schools and high schools Logo Comenius or other that will give similar effects should be introduced, like in the turtle technique and in high school something that will allow children to work on their own development.
11. In the case of teacher training:
    - increase the number of hours set for media education. The subject of computer and media education should be run by teachers that have greater knowledge about the media and communication. In this case strict standards should be set between teachers. Lack of knowledge in a given subject should disqualify a teacher right away.
    - The criterion for a subject connecting media education and computer education should be teachers' abilities in the field of information technology, knowledge about the media and methodology. Employing a computer teacher that lacks methodology should be banned. In such a case there should be an immediate reaction of the Ministry of Education. This will stop the flow of teachers that are not well prepared pedagogically. Maintaing the current standards by schools will stop them from reaching the set goals.
    - Introduce mass education for teachers of other subjects in using systems of distance learning. Activate IT teachers tutoring systems in the field of media information technology.
    - On the server of the Ministry of Education information should be submitted about new directions of work – education coming from the mass introduction to technology information..

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