HOW TO ENHANCE CLASSES BY USING PCS, THE INTERNET, AND MOBILE PHONES

Prof. Milan Matijević, DSc
Faculty of Teacher Education
University of Zagreb
milan.matijevic@zg.t-com.hr

Abstract: According to the results of a survey conducted in 2006 in Croatia (N=2,994), 75% of pupils in primary education have a computer at home. Of this number, 70% are connected to the Internet. All elementary schools in Croatia have special classrooms where information can be accessed on the Internet, but it is planned to equip all classrooms with one computer connected to the Internet. A large number of primary education students (and almost all in lower and upper secondary education) have modern and powerful mobile phones. This communication technology is not sufficiently exploited to allow for changes in the manner of communication and teaching in schools. In this paper, the author comments on the results of the empirical survey and presents several opportunities for enhancing classes by using PCs, the Internet and mobile phones in primary and secondary education. Teachers have to significantly change their role and manner of work, and the preferred targets of teaching should be to search, select and use information, and to use new media to communicate, both at school and outside.

Introduction

In the time of Jan Amos Komensky, books were the main, if not the only, communication medium. Then, he defined a didactical framework for teaching in schools which we now call the class-subject-lesson system. This system has not substantially altered from that time, with the exception of rare, alternative schools (for example the Waldorf or Montessori schools, and different variations of free schools). Today, the media environment has significantly changed (Matijević, 2007). New media provide the opportunity for work and communication in a different way from that described by Komensky in his "Great Didactic". There are various reasons why teachers working in primary and secondary education do not sufficiently exploit these new media, and have difficulties abandoning the proven traditional methods and strategies.

On this occasion, we will deal only with the possible effects of using PCs, the Internet and mobile phones in school and class communication (for more on these issues, see Jolliffe, Ritter, and Stevens, 2001; Fritsch, 2003).

The new (multi)media environment

Older adults may remember the time when no television programmes existed in our region. Many of us adults grew up without cartoons and educational television programmes. In Southeast Europe, regular programmes were broadcast on television precisely fifty years ago. Until twenty years ago, there was no Internet or email. The first personal computers that appeared were Commodore 64 and Spectrum ZX. And a substantial sum of money had to be spent at that time on such "toys".

In the last fifteen years, there has been a swift growth in the number of computers in homes (and the number is still rising). Since 2002, we have conducted an annual survey to investigate the growth in the number of PCs and Internet connections. This longitudinal study has encompassed between 2,000 and 4,000 respondents each year. The methodology is simple: primary school children are asked whether there is a PC in their home, and whether the computer is connected to the Internet. The results of the survey are then compared in terms of the children's gender, place of residence, and

the class they attend. The first survey revealed that parents usually buy computers when their children start school (when they learn to read and write), that they are more willing to buy a computer if they have a male child, and that the purchase also depends on the class the child attends (probably by following the logic: "if you bring home a good report this year, we will buy you a computer!") Thus, through pupils in the first years of primary school, we have discovered the rhythm with which computers come into Croatian homes, as well as their number. Naturally, since they are expensive devices, computers are used by all the persons in the home, regardless of their age. When the computer is introduced into the home, the media environment in which young people and adults spend their free time changes drastically, and so does their lifestyle and manner of communication.

Below, only the results of the first and last year of the survey (2002 and 2006) are presented.

LOCATION	PC - YES	%	PC - NO	%	TOTAL
ZAGREB	749	58.15	539	41.85	1,288
OTHER	424	42.92	564	57.09	988
TOTAL	1,173	51.54	1,103	48.46	2,276

Chi-square 51.973   df = 1   p > 0.01

Table 1: PCs in homes in 2002 (frequencies and percentages)

From the first survey (Table 1), it can be seen that more than 50% of households own a computer, and that the number of computers was significantly higher in the capital than in other towns around the capital (distance up to 100km; the difference is statistically significant).

CITY / COUNTY:	PC - YES	%	PC - NO	%	TOTAL
CITY OF ZAGREB	1,511	78.86	412	21.4	1,923
COUNTY OF ZAGREB	437	73.9	154	26.1	591
OTHER COUNTIES	1,046	69.3	463	30.7	1,509
TOTAL	2,994	74.4	1,029	25.6	4,023

Chi-square 38.152   df = 2   p > 0.01

Table 2: PCs in homes according to place of residence in 2006 (frequencies and percentages)

CITY / COUNTY:	INTERNET -YES	%	INTERNET - NO	%	TOTAL
GRAD ZAGREB	1,104	73.1	407	26.9	1,511
COUNTY OF ZAGREB	293	67	144	33	437
OTHER COUNTIES	697	66.6	349	33.4	1046
TOTAL	2,094	69.9	900	30.1	2,994

Chi-square 14.189   df = 2   p > 0.01

Table 3: Internet in homes according to place of residence in 2006 (frequencies and percentages)
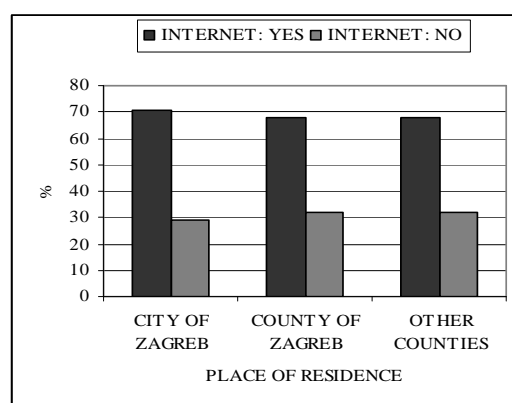
Figure 1: Internet in homes in 2006

Thus, we have a picture of the media environment in the homes of the school children. All schools in Croatia have special classrooms with access to the network of networks, the Internet. One computer connected to the Internet has been installed in many classrooms. However, the only idea that most teachers arrive at concerning such powerful (hypermedia) technology is to use PowerPoint. This means that teachers behave according to the paradigm of teacher-focused teaching. This is how they were taught at teacher education faculties, and they behave according to the behavioural repertoires acquired there. The only thing that has changed is the technology of presenting events to students, but the position of the student has remained the same as for teacher-focused teaching. Their role is to sit, listen and watch!

The mobile phone in class and at school

Almost all children attending primary or secondary school in Croatia own a mobile phone. Parents buy functional and powerful mobile phones as gifts for their children. Some of the children are real masters in using this technical communication tool. Many of them are much more skilful in this than us adults.

This raises the question of *whether, when, how and how much it is necessary* to learn about this communication medium at school. A second question is also didactically interesting: how can classroom communication be enhanced by this communication medium? Naturally, it is important to learn about communication culture in general, and about the culture of using this medium in particular.

Experiences in Croatian schools vary significantly. Some schools do not allow children to bring their mobile phones to school. In some schools, children must turn off their mobile phones and give them to the teachers to keep until the end of the school day. In most schools, children can keep their mobile phones, but must not have them in their hands during lessons.

For the needs of this paper, the above questions were put to teachers working in primary education. Their experiences and answers to these questions also differ. From the enthusiastic "Yes" followed by many ideas (teacher Sanja), to a cautious "Yes, but…" (teachers Diana, Martina, Mila and Goran).

Teacher *Martina Kolar* believes that during lessons in their fist language pupils can practise writing brief and clear messages (notices) using abbreviations and applying the rules of orthography and communication. In real life, children seldom write notices, but have the need to transfer a message or information. They can easily and cheerfully do this by mobile phone. They should be taught how to do this, and instead of simulating it (by writing information in their exercise books), they can actually do it through text messages.

Below is a list of ideas for using the mobile phone to enhance the classroom and educational communication between teachers and pupils:
1. as an alternative to correspondence between classes through the post,
2. as an alternative to correspondence between classes by email,
3. the teacher sends homework tasks to some (gifted, handicapped) pupils,

4. the teacher sends individual tasks to all pupils,
5. pupils reply to the teacher,
6. to help a friend who has been ill and has to stay at home or in hospital for days,
7. communication with pupils who have to stay in hospital,
8. taking pictures of, or recording, interesting details during class excursions,
9. the teacher providing important information to parents,
10. parents providing important information to teachers,
11. calls for help by abused children,
12. calls for help by children who have had an accident, or learning how to send a message with information about an accident that has happened to someone else,
13. for work on group or class projects,
14. exploiting the various functions of a mobile phone (calculator, calendar, games – fun during breaks, voice recording, time keeping),
15. recording brief films during outdoor classes, and transferring them to the class computer (see similar ideas in Cole, G. 2006).

Teacher Sanja's list differs from the above, and the ideas and warnings provided by teachers Diana, Milka and Goran are interesting from an experiential point of view (see below).

Teacher Sanja Polak's – ideas for using the mobile phone for pedagogical/teaching purposes:

Surprise message – Each week the teacher motivates pupils for work through a surprise message (for example, one text message read: *Read 20 pages of the reading assignment by Monday and then report back to your teacher*).

Let everyone know – All parents have the mobile phone numbers of all pupils and communicate when they need to check information (if someone was absent, or cannot remember what has to be brought to school the next day…)

Game: I'm your friend! – On the teacher's suggestion, all the pupils send a happy, encouraging, or comforting message to a particular pupil.

You are OK! – On the teacher's or a pupil's suggestion, all the pupils that day write a message to a particular pupil stating all his or her good qualities.

Help, I'm embarrassed! – Pupils inform and confide in the teacher by text message when they are too embarrassed to say it in person.

Special praise **–** The teacher praises by text message five pupils who have excelled in something each week

Instead of a whisper – The teacher warns a pupil without other children knowing. This is better done by text message, because he or she can think about what to write, the message is saved, while, in verbal communication, teachers might say something they did not intend).

Dream message – development of creative thinking – the teacher sends a bedtime message which boosts creative thinking, such as: *Good evening! Before going to sleep, imagine that you are under the sea. You feel comfortable and light... Tomorrow you will tell me who you met and all the nice things that happened to you...Good night!*

Forgetful teacher – Teachers sometimes forget to give a piece of information to their pupils during class. In that case, they can send a message to all pupils, such as: *Forgetful teacher has forgotten to tell you that tomorrow we will need scissors, glue and coloured paper for the Art class.*

Learn thorough experience - the teacher sends an encouraging message suggesting that the pupils visit a museum, a shop, a market, a meadow, a park, etc., to experience what they have been learning at school.

Spreading the feeling of belonging and community – All pupils and the teacher set up a special ring tone on their mobile phones for the teacher's or other pupils' messages. When they hear the tone, they will know that a message has arrived from the teacher or a schoolmate.

Checking orthography and grammar – pupils send messages at the teacher's request, which have to be grammatically and orthographically correct. The teacher saves all the messages, and tells the children the next day if they have had made any mistakes.

Messages to the teacher entitled: I feel good when... I feel bad when... Once a week, pupils send messages to their teacher starting with *I feel good when...,* or *I feel bad when...* The teacher

receives the messages which make him or her think about his or her manner of work and approach to pupils.

Messages to the teacher entitled: I'm sorry, but... – Pupils are given the opportunity to apologise to their teacher through text messages for not completing an assignment, or for their behaviour during the lesson.

Have a nice day – every morning, the teacher writes something nice to one pupil for the beginning of the day. On that day, the pupil feels special and happy!

Teacher Diana Radovanović – The mobile phone as an alternative or a substitute for direct communication

I most frequently use the mobile phone when parents call me, especially one parent whose child has APD (attentional priority disorder) due to ADHD, and often fails to understand what she should write for homework. Then her father or mother calls, we briefly share experiences and tasks, so that the next day Valentina might be more successful. I also have a girl who is waiting for an operation in hospital, so I send her a message of encouragement, or information about what we learned in class every day. Then, I use the email for a parent who is in Germany for one month, and one month at home. In this way, although he is a long way away, he can still contact the teacher as if he had been to a parent-teacher session (everyone has been offered this option, but they do not use it). Older pupils (4th year primary school) use mobile phones as a sound medium, they send one another songs though Bluetooth, etc., and those who are even older (in subject teaching) record parts of the class, make shots of teachers in awkward positions, and one teacher has already found himself on YouTube in a pedagogically unsuitable state.

Teacher Milka Fofonjka: Mobile phone – Yes, but with caution!

Speaking as a teacher, but also as a parent, I would not forbid mobile phones. On the contrary, if the parents can afford it, a child should have a mobile phone, because I assume that in this way it is easier for parents to supervise their children (they can check at any moment where the child is). The child can also contact the parents if they have a problem.

I am not completely sure that the mobile phone should become a teaching aid, because, apart from the opportunity of communication (writing short messages) and taking pictures, I do not see much use for it in class. I believe that with the development of technology, which we see around us every day, exercise books will soon be replaced by some kind of device which will store all data, and also communicate, take pictures and connect to the Internet. And all this will be very easy and affordable (something similar to a laptop).

I do not like the idea of using my phone impulses to send messages to parents when I can do all this in a much simpler and cheaper way by email. Can you imagine my mobile phone ringing 32 times because all the parents are thanking me for informing them about a meeting? I immediately remember the story of a teacher explaining to her pupils in class what a pond was, and the real pond was only a few gardens away. We have cameras for taking pictures (OK, the mobile phone is always at hand, but...), the fixed line has existed for over 100 years, so…

Certainly, the mobile phone is not a bad thing, but, just as is the case with most new things, the older generation who are not familiar with these novelties develop a negative attitude to them and reject them. Thus, people very often forbid children from carrying mobile phones, and they even confiscate them.

All the mentioned ideas for using mobile phones are all right, but all this can also be done through the fixed line, by using email – so why the mobile phone?

The mobile phone has an excellent function, and it performs it well. But I cannot think of anything that the mobile phone could be used for in class which could not be done much better by something else. So, let us avoid using technology just for technology's sake.

Teacher Goran Lapat: The mobile phone has its strengths and weaknesses!

Roma pupils progress quite a lot by writing and reading messages, because they have to write in a way that can be decoded and understood by the receiver. Also, while they search the phone menu they

exercise the use of "difficult" Croatian words (update, conference call, server… all words that we do not use in our everyday speech).

They most often use the mobile phone to listen to music "folk, but also extreme" and to take pictures "as a keepsake" of other girl pupils – we even had to intervene on this one, because they went *overboard*).

Other (non-Roma) pupils misuse the mobile phone more than they use it – for example, they record video clips of teachers during class and in the corridors, and probably each one of us has already had a "role" in a 5-minute film that they exchange when they arrive home. We have allowed the children to use mobile phones during the breaks, before and after class.

Pupils usually use mobile phones:
- to prove the status of their parents and to embarrass those who have "museum pieces"
- to write (silly) messages, such as, How r u? Ok. Watching tv? Yup! Of course, these already constitute four messages…
- to exchange songs and listen to them, and to save all kinds of immoral (vulgar) videos
- for answering messages (Send this message to ten people, or a terrible accident will happen...).

It is difficult to use a mobile phone as a teaching aid because, assuming that all children have one, the problem is to standardise the devices (just like textbooks or configuring a computer), because children often inherit a mobile phone that the parents no longer need (or is not in the best of shape) under the motto "it's good enough for them".
- some do not have a colour screen
- some do not have "real" sound (it would be great if children could have the songs from their music class on the phone – either as a ring tone or a separate file)
- some do not have a camera (to take pictures of their art work or a piece that they like)
- some do not have the option of sending pictures (MMS) (from an excursion, outdoor classes, out of school activities...)
- the possibility of connecting to the Internet (if the mobile phone supports it) is expensive and, until it becomes free, it will remain the privilege of the wealthier ones
- Anyway, it is better if they have one, because a child "is never alone" with the mobile phone. They also often save time because the parent does not have to wait in front of the school and think, "will she stay for remedial classes or additional classes, or goodness knows what", and it enables us to "rescue" forgotten trainers, temperas, etc.

Where are the teachers in all this?
- When children get hold of the teacher's mobile number (for them it is a great and important thing), they often misuse it (they play tricks, they call from a private number…), but we have not had one case yet where a child called to hear about homework or to be given additional tasks!
- How can you set a pupil a task when the message is limited to 160 characters? It is unlikely that one message will be sufficient, and each message costs both the teacher and the parent
- Perhaps the Ministry could offer a 0800xxxxxx (freephone) number to teachers, so that the pupils could call them for free, but at an agreed time (and this should be strictly complied with because teachers, too, have families and want some privacy). Email is much more flexible, since you can have a special address, you can send all kinds of things… from PowerPoint presentations, to photographs and texts… but this should also be free for schoolchildren (CARNet is on the right path)!

* * *

As can be seen, children begin to use this powerful and interesting medium, as usual, before they go to school! Pupils have gained a great deal of information about this communication medium through various forms of nonformal or informal learning. It may be concluded by analysing the answers of our respondents (teachers) that it would be appropriate to empirically test how the offered ideas could be put to good use. There is also a need to adopt a standard for the use and behaviour of teachers and parents, taking into account the pedagogical, psychological and legal aspects (right to privacy – taking photographs without the approval of children or parents, etc.).

Didactical strategies for learning in a new (multi)media environment

The presented communication media can significantly change the manner of communication in class and at school. With the appearance of such media, experts have been faced with many questions. The most important things related to learning about these media are the questions: *when, how, and how much*? *What* should be learned about computers and other communication media? *How* and *what* to learn *by using* these media? How to use these media to improve the quality of educational communication and the quality of achieving the educational goals? How will communication through these media from the earliest childhood affect people's lives twenty years later? Despite varied research, it is difficult to give comprehensive and scientifically founded explanations on these matters.

For centuries, teachers have been dreaming about being able to communicate on a one-to-one basis. Today, we can technically achieve this by equipping each pupil's place of work with a computer. However, experts in class and learning matters are aware that while many things can be learned through computers, and that some traditional teaching problems may also be resolved in this way, there are still many competences important for life which cannot be acquired through a computer. Currently, there are more experiments going on, and questions are being asked, but specific answers and explanations are less frequently offered (see Garthwait and Weller, 2005). We are aware that the manner of learning and teaching should be changed substantially. We are also aware that learning can take place at any time and anywhere, and not only at school (March, 2006; Matijević, 2000).

What is the future of learning? What to learn for the future? How to learn for the future?

The presented media and the state of these media from the perspective of the Croatian and European school system indicate that there is a need to change teaching and learning aims and strategies. These media are much better and more efficient at preserving, transferring and processing information than children's heads! Therefore, one of the traditional aims of learning (memorising facts) should no longer be on the list of important teaching goals, or at least it should not be as important as it was twenty or a hundred and twenty years ago.

Today's children must master other competences for the future, and these media can be a great help in achieving this goal. Such competences include the seeking and selecting of information, using information, and employing methods and theories to resolve everyday problems. *Cooperation* and *tolerance* as life values and competences have much more significance today than was the case previously. The Internet, PCs and mobile phones can greatly improve the quality of communication. This means that new rules and a new culture of communication should be acquired (answers to some of the above questions are offered by: Arnold and Lermen, 2006; Edwards, Hilburn and Grawford, 2001; Issing, 1998, Keegan, 2002, Tulodziecki and Herzig, 2002).

Conclusion

Most teachers in today's schools have acquired the models of behaviour of student-focused teaching. Very quickly, powerful communication media have arrived in schools and homes. Pupils learn about these media outside school, and use them more frequently outside school, but not enough to meet school or class needs.

The teaching manuals that teachers use to learn and develop professionally still generally take the position of teacher-focused education, rather than following the path of student-focused teaching. Media, such as PCs and mobile phones, are by nature designed to be used by a single person (personal computer or personal mobile phone!).

Schools and experts in these schools are surprised by the questions raised and the situations caused by these media (the computer in the classroom is more in the way than useful!). In fact, teachers have difficulties in keeping discipline with a computer that provides only attractive games (which are often exceptionally valuable in pedagogical terms), which all the pupils would like to play. There is too little good quality educational software, or none at all. Pupils also bring mobile phones to school and use them there, often in a way that is not pedagogically planned and which goes beyond the limits of polite behaviour and communication. Therefore, there is a great deal of work to do for teachers and other educational experts.

This problem is not only topical in Croatia. The Scottish Minister for Education, Hugh Henry, told the Scottish councils in February 2007 that it was necessary to ensure clear and efficient

guidelines on the use of mobile phones in schools. Strict sanctions were envisaged in the case of misuse of mobile phones as a form of harassment and abuse. The Scottish Executive Education Department produced a "Safe and Well" handbook which provides guidance to schools for drafting their own guidelines on using mobile phones. Such guidelines should provide clear instructions on the use of mobile phones, and should be developed in consultation with parents, pupils and school staff. The rules should include sanctions for the misuse of mobile phones, and rules on confiscation and returning mobile phones to children (The Scottish Government, 2008).

Some pedagogical aspects of living with contemporary communication media have been described. Didactics is also confronted with great challenges. The didactics of education where the teacher is the main subject should gradually be replaced by e-didactics or multimedia didactics which offer scientific explanations about the learning process in this new media environment (Arnold and Lermen, 2006; Issing, 1994).

References

Arnold, R. and Lermen, M. (Hrsg.), (2006), eLearning-Didaktik. Baltmannsweiler: Schneider Verlag Hohengehren.

Cole, G. (2006), 1001 Essential Lists for Using ICT in the Classroom. London and New York: Continuum.

Edwards, T., Hilburn, S. and Grawford, C. M. (2001), Creating Successful Learning Environments Using a Web-Enhanced Computer Classroom. In: "WebNet 2001: World Conference On the World Wide Web and Internet" (Proceedings), (6th Orlando, Fl, October 23-27, 2001), 7 pp.

Fritsch, H. (Hrsg.), (2003), The Role of Student Support Services in e-Learning systems. ZIFF Papiere 121, Zentrales Institut fuer Fernstudienforschung, FernUniversitaet, Hagen, 110 pp.

Garthwait, A. and Weller, H. G. (2005), A Year in the Life: Two Seventh Grade
Teachers Implement One-to-One Computing, Journal of Research on Technology in Education, v37 n4 pp. 361-377.

Issing, L. J. (1994), From Instructional Technology and Multimedia Didactics. Educational Media International. V31, n3, pp. 171-182.

Jolliffe, A., Ritter, J. and Stevens, D. (2001), The ONLINELEARNING Handbook: Developing and Using Web-based Learning. London: Kogan Page.

Keegan, D. (2002), The Future of Learning: From **e**Learning to **m**Learning. ZIFF Papiere 119, Hagen: Zentrales Institut für Fernstudienforschung, FernUniversität.

March, T. (2006), The New www: Whatever, Whenever, Wherever. Educational Leadership, Vol. 63, No 4, pp. 14-19.

Matijević, M. (2000), Učiti po dogovoru. Zagreb: CDO Birotehnika.

Matijević, M. (2007), Internet, osobna računala i nova obrazovna sredina. U: Pedagogija: prema cjeloživotnom obrazovanju i društvu znanja. Zagreb: Hrvatsko pedagogijsko društvo, pp. 159-172.

Tulodziecki, G. und Herzig, B. (2002), Computer & Internet im Unterricht: Medienpäddagogische Grundlagen und Beispiele. Berlin: Cornelsen Scriptor.

The Scottish Government (Education and Training) (March 3, 2008)
http://www.scotland.gov.uk/News/Releases/2007/02/08131122