Lecturer Usage of ICT Tools as Intelligent Educational Solution

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Abstract: The tools of Information and Communication Technology (ICT) have appeared in more and more countries in the last 20 years. In Europe, more than 30 kinds of interactive boards are in use. To each type, additional tools are obtainable, and generally the uses of these also require special knowledge and acquisition. Education could become more colourful and effective by diversity, professional and deliberate usage of ICT tools. The new tools have induced changes in the methodology of education. We will present in the lecture multimedia works that can be visualized on the interactive board.

Key words: Electronic Learning, ICT, Interactive Board, iPanel, Project Method, Tablet PC, Team-Work.

INTRODUCTION

The appearance of personal computers reformed the basics of education. The future effect on the society of the ICT is growing and soon it will influence all side of our lives. The importance of these changes match the significance of cultural and social impact what the invention and spread of impression brought forth. The computer – of course – is only a tool; in service of solving daily manual tasks faster, nicer and more accurately, and what we earn is time which can be invested in creative work. Computers cannot only be used to create the information /intelligent typewriter/ or to display it /overhead projector/, but to collect and process the information created by others /Internet, multimedia, CD, e-mail/.

Apart from the Gutenberg-galaxy /traditional tools/ the usage of the Neumann-universe is needed /which can be reached by computers and Internet/. Utilising the computers' image and sound creating "abilities", lessons can be enhanced with multimedia applications that can show chemical, biological, physical or even social phenomena and processes that would be impossible to demonstrate otherwise. Also, it can prepare the student how to participate in the economical world [1, 2].

The most important pedagogic opportunity is the concentration on studies through the use of software. By this, students can extend their view over the subjects. This has been a desire of education for long, but its true realization will come only by the computer as an aiding tool. This will demolish the rigid walls, present for ages, between the subjects. The use of informatical approach is the requirement of convertible knowledge. The hypertext/hypermedia based programs, the use of Internet and the CDs will cast light on the structure of thinking. Writing is a sequential disclosure: its sequence is bound. On the other hand, pure information is not knowledge by itself, since thinking is not sequential, but associative combining and heuristic. The unsequential disclosure is the hypertext. This is a structure of knowledge beyond the text, its elements arranged into a multidimensional web. There are more viable roads than what is pre-built. With the computer it is possible to arrange multidimensional relations over the maximum two-dimensional possibilities of simple paper [3].

With the appearance of the Interactive whiteboard the role of informatics in education took a new turn!

1. THE EDUCATION SUPPORTING TOOLKIT
1.1 The process of the appearance of tools

200 years ago the writing slate appeared. It was a wooden framed, flat surfaced, book sized tool, on which the children scratched the numbers and letters with slate-pencil. (Slate-pencil is made of really fine granular, clear and big, rigid shale with which it is possible to write on a slate.) Afterwards, green and black panels spread widely on which was written with chalk. Besides, the white plastic whiteboard appeared which was used

with felt tip pen. The use of overhead projector allowed the multiple uses of prepared supplementary materials by the possibility of projecting materials many times.

After personal computers became widespread, the Internet revolutionised the access to information, presentations made in PowerPoint that are easily modifyable, engaged students' attention.

Today the tablet PC and Interactive Whiteboard (Fig.1) is causing revolutionary changes in the education sphere.
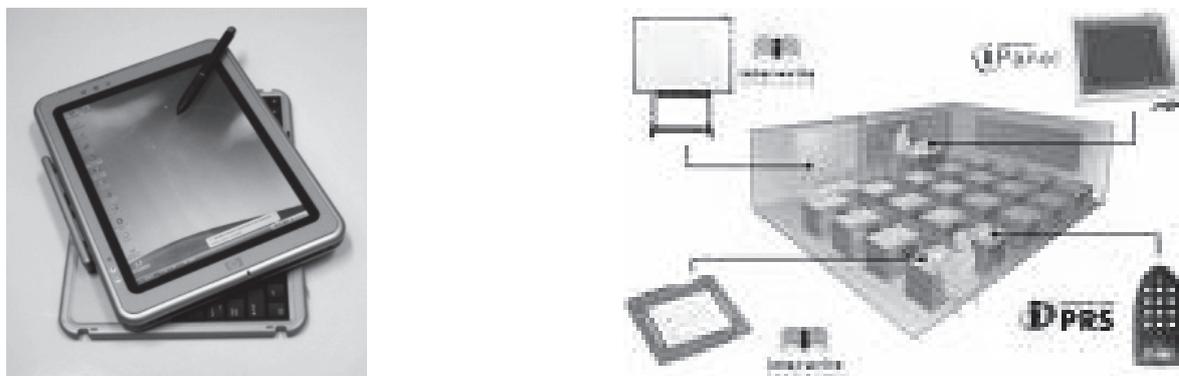
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Fig.1. The TabletPC and the Interactive board

Though in the poorer parts of the world the Interactive Whiteboards have not spread, still newer and newer imaginations and tools are born day by day due to the fast technological development of our age.

While today Interactive Whiteboards can be touched only one finger or stylus, in the future the Multi Interactive Whiteboards will allow that at one time more people will be able to make contact with the panel.

1.2. Interactive Whiteboard

Interactive Whiteboards appeared first in the courtrooms of multinational companies around 1990. In 2002 Interactive Whiteboards spread in the educational sphere of England, Scotland, New Zealand, Canada, USA, South Korea, Malaysia, Singapore, Kazakhstan, Netherlands, Sweden, Mexico, In Hungary Interactive Whiteboards have been distributing for a few years.

Interactive Whiteboard is an ICT tool which links the whiteboard with a computer /and a projector/ with the help of a software in a way that the board is controlled by the Touch Panel. Furthermore, the contents (noted down on the whiteboard) can be saved on a storage device. The computer's aided design then projected onto the board, while the board is in use as a Touch Panel by standing by the board and controlling it. Projecting the material, the content can be completed. The packet of the Interactive Whiteboard contains: notebook, projector, the Interactive Whiteboard itself and different accessories.

The types of Interactive Whiteboards: According to the method of usage Interactive Whiteboard can be fixed on the wall or can be rolled. According to its size it shows variability in different types; the projection can occur from opposite, back or above. According to the method of control it can be based on the changing of resistance (using your fingers) or the electromagnetic principle (using stylus).

1.3. Accessories for the interactive whiteboard

Through of standard use of interactive boards the person who handles them gets into direct contact with the board. Many times it would be better to get away from the board and to make explanation and meanwhile he can keep control over the board. The lecturer

standing in the front of the whiteboard can hide it from the audience. In large rooms, large whiteboards are useful however, those can be hard to reach for the lecturer. What I can do by standing front of the interactive whiteboard; I can also simply do with a small LCD-screen device with a stylus. The possible solution could be the interactive panel /slate/ (e.g. the InterWrite iPanel)

Fig.2. iPanel, School Pad and GTCO InterWrite PRSRF

It's possible to control the whiteboard (from the interactive panel) anywhere from the room, or to involve the student as an active participant with the help of a school pad. This device has a 6" x 8" (15.2 cm x 20.3 cm) sized work field and seven units of it can be connected to the system using Bluetooth (wireless) connection, with a range up to 90 meters.

The teacher can use these devices not just during teaching, but during the checking of the learned lessons. With the help of several radio RF systems calculation results, years, names and places could be easily visualized. All the mentioned devices are very common.
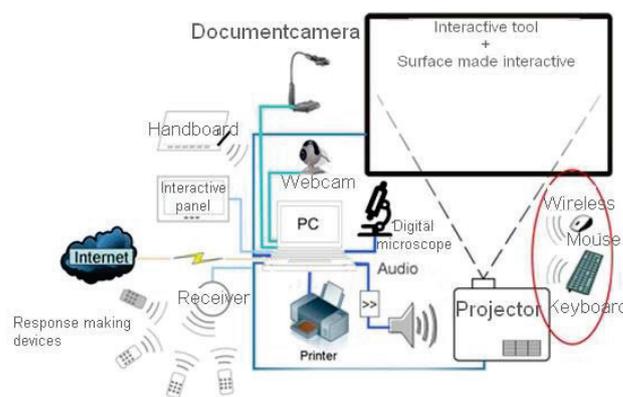

Fig.3. Rich configuration

The appearance of more accessories in the market is limited by their price. During teaching, teachers might need to print some test exercises. In this case, the presence of a networked, central, multi-functional digital printer would be enough. The document camera is a modern substitute of the overhead projector. The document camera is used for the transmission of non-electrical documents to a computer via USB port, and the projection of these documents with the interactive whiteboard. Even bugs, plants or coins could be examined with it.

Digital microscopes are able to magnify the image of tiny objects with 200 times magnifying, and enable the capturing and editing of the image with a digital camera. The use web cameras will be valorized: the class-work can be recorded or streamed to another

place in the Globe. The use of the mentioned devices could be limited by the number of available USB ports and the length of cables. The wireless mouse and keyboard ease up the work for students with disabilities. The volume in audio programs can be controlled with hand gestures; the switching between tracks is done with a jerk of the wrist.

The appearance of wireless interactive whiteboards and mobile interactive devices more ease up the learning process, the connection is realized with Bluetooth connection, with range up to 10 meters. With the help of wireless WiFi technologies and hi-tech data compression, video and data files (e.g. PowerPoint slides) can be transmitted to the projector; even 16 computers can be connected to one projector. The display can be split, so the work of 16 students can be evaluated simultaneously.

The interactive whiteboards open a new dimension in the way of cooperative work with the modification of our internet connection. We are not using the internet just for downloading data, collecting information, but we can make an appearance on the internet. With the help of this function we can invite the students and teachers of an abroad school. This means, that the participants can see the content of the teacher's whiteboard in their own, and they can upload contents to the teacher's. With the completion of the connection with pictures and sound files, a regular mini-videoconference could be realized. This can be done easily with the free Skype messaging program with the help a web camera connected to our computer [4, 5].

If we lay down the interactive whiteboard and use the projector from above, the results is an interactive plotting board. With a mobile interactive device, which can be used on any plane surface, we can make an interactive bulletin board. In this case, it could be convenient to use a system which has a touch-controlled interface.

2. CHANGES IN THE MAIN CURRICULA
2.1. The role of the ICT tools in the major courses

Even the newest ICT tools cannot be used effectively without the teacher's choice of what topic to include, and what kind of tools he could use in his aid to make the lecture more interesting and also helpful for the student to understand the concept of the lecture.

The classical method where we used black and later on dark green chalkboards to hang on big maps, figures to aid students to understand the topic made it impossible to write further on the board, unless we took off the poster/map/figure. In case of sciences, we used to get some objects, or smaller experiments to demonstrate our point, and these generally were impossible for the students to see again. The introduction of the overhead projector seemed to have solved this problem. The big advantage was that the transparency films that were used could be kept and used for years. The whiteboard seemed to ease the process of explaining something to the students and then erasing it without any haste that was common with the use of blackboards that the sponge should be wet, but not too wet, and have to wait for the board to dry in order to write again with the chalk. However, the greatest change was the introduction of personal computers.

The projectors made it possible to present to an audience. The presentations are easy to make using Power Point Presentation program. These can even include videos that the teachers can play during class hour. With the appearance of internet; this all became even easier, the search for information. To carry these electronic objects the trolley became a big aid, and the bags that have wheels, similar to the carry-ons used today at flights.

The TablePC offers many options, and these all help to students, and are becoming more and more popular throughout the world.

The interactive board became the centre of attention. In places, where this is already in use, no need for fabric screen. By its touch sensitive screen it allows a greater space for

the teacher for displaying a Power Point presentation, but even during the use of computer in the class hour. However, the real value of it really shows off if the board's software is also used. With this, the teacher makes his presentation at home, and during his lecture he can manipulate, change, add something to it during his presentation, and can save the newer version that will be available for the students [6].

2.2. Tools that aid for the handicapped

In Europe about 10-12% of the population has disabilities. These individuals, as well as individuals who are handicapped temporary due to an accident, and the elders represent about 30% of the population in Europe. This means, Europe is getting older which going to have serious consequences. By 2050, people who are over 60 years old will represent 34.5% of the population.

Fig.4. Another solution

There's a new tool available from the interactive boards. This is the Clasus interactive board system which can be fixed on to the wall, but there's also another version where it is on a stand with wheels.

The stand can be changed in terms of its height which makes it available for any kind of user starting from adults to children, handicapped, so that it becomes easier to manage the board, and use its features. With these features we can adjust the height, the place without recalibrating each time which means we can even change height or place anytime during the usage of the board. The advantage of the projectors is that they display the screen from close which means that they do not disturb the vision of the lecturer. This is even more important if we use it as a daily tool. Another advantage is that casting shadows are minimal, the pictures are clearer, more accurate, enjoyable.

In the previous paragraphs, I mentioned less on how these all help to people with disabilities in the educational system. While blind and visually impaired people would have a hard time using a computer, we needed to develop such tools that enabled them to take advantage of this electronics era. The interactive boards have many different versions some are exclusively developed for handicapped people. These contain different tools that are also helping other users as well.

The Clasus board sytem (Fig.4.) enables a handicapped student to work on the interactive board. Another solution is the hand held boards (such as SchoolPad) when the handicapped student does not need to change location, he can manipulate the board straight from the hand held board that he has in his hands.

CONCLUSIONS AND FUTURE WORK

I believe that international relationship is very important in here. True, that the different and complex school materials are impossible to integrate internationally, however exchanging ideas are possible. There are multiple websites for teachers (http://interaktivtabla.lap.hu) to help them as well as the manufacturers also provide free courses online to make these boards to become more popular (https://webmail.inf.u-szeged/src/webmail.php Web-Based Live Training, online courses as Quick Learn).

During my presentation at the conference, I intend to present their importance, their advantages through short video illustrations, how students at different ages approach these tools, and how they help in the education. Among the ICT tools, the most attractive is the interactive board, and I find it very important to present its motivational effect. In the University scale (Bsc, Msc) my students, without their age, but dividing them as students who are earning their first diploma, students that study only part time, students who are earning their second diploma. However, all these students showed interest in these ICT tools. The primary and secondary school use will be reviewed by my teacher candidate thesis writers, while the higher educational use will be introduced within the frameworks of a lecture with the method of Pecha Kucha with the use of my own lecture materials [7].

The necessity of „Lifelong Learning" helped E-learning to become wide spread and today ICT is a part of this. More than 30 countries take part in this conference series, and it would be practical to examine how and in what extent they use the possibilities of ICT. I would volunteer with pleasure the collecting and analysis of data on this topic.

REFERENCES

[1] A. Ringler, K. Vezendi, K. Füzesi, and I. Füvesi: "Multimedia In Health Education", 2nd International Conference on Information, 2003, Mansoura, Egypt.

[2] I. Füvesi and A. Ringler: "Team-work in special subject education support with multimedia", 4th International Conference on E-Learning and 4th International Conference on Information (ICI-4), 2005, Kuala Lumpur, Malaysia.

[3] I. Füvesi: "Cooperative Learning in ICT Tools Supported Environment", CEEPUS, Johannes Kepler University, Linz, Ausztria, 2007, http://www.ssw.uni-linz.ac.at/Teaching/Lectures/SpezialLVA/Fuevesi/

[4] Dr. István Füvesi: Interactive Boards and their Function in Education, Columbia University, Teachers College, ICELW 2008. The International Conference on E-Learning in the Workplace, New York, NY, USA, 2008, http://www.icelw.org/home.htm

[5] Dr. István Füvesi: Interactive Boards and their Function in Education, International Journal of Advanced Corporate Learning (iJAC), Vol 2, No 1, Febr. 2009

[6] Dr. István Füvesi: From the slate to the multi-touch, The 4th International Conference on Interactive Mobile and Computer Aided Learning, IMCL2009, Princess Sumaya University for Technology, Amman-Jordan, 2009, www.imcl-conference.org

[7] Dr. István Füvesi: ICT tools in service of the special subject education. ACEC2010, Melbourne, Australia, 2010.

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