Using MyIMLE in education
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Abstract

A new system which serves for connecting various HW devices and didactic technologies (such as interactive whiteboard) with PC is being developed at the Faculty of Education of Masaryk University. This system has a name MyIMLE (My Interactive Multimedia Learning Environment). The aim of this contribution is to show the possibilities of didactic use of MyIMLE system in education at various types and levels of schools. This system can be interesting for teachers because of an easy installation, intuitive control and many possibilities of using. A theme describing causes, behavior and consequences of tsunami was chosen as the example for practical demonstration. It is possible to use this theme in many subjects of various types and degrees of schools – from pre-school education to university level. This theme can be applied not only in coastal countries, but also in inland countries because this phenomenon can appear also on reservoirs and artificial lakes.

Using an interactive whiteboard together with MyIMLE system makes possible to use and to control real simulations (aquarium that simulates tsunami controlled by PC) of the lesson topic with maximal active participation of students. The system communicates with PC thanks to Adobe Flash and the only condition is to have Adobe Flash player installed. Adobe Flash is also a part of a majority of interactive whiteboards and therefore it is possible to use once created environment independently on school equipment of interactive whiteboards. Thanks to this, schools have a better availability of created applications and even teachers are able to create new environments.

Using real models together with didactic technologies in education improves the educational process and also adds new possibilities of using interactive whiteboards, which is another benefit for the education itself.

1. Current education

There are currently many possibilities available thanks to a fast development of computer systems, but the capability of using these possibilities depends on teachers and their style of teaching. This fast development brings not only positive aspects, but also some negative aspects. A positive aspect is a possibility to link a theoretical part of a lesson with real life situations, which is one of main aims of education. Another advantage is a better financial availability of these systems for schools and students. A negative part of this computer “boom” is in its possibilities. There are currently too many possibilities and it is not possible for teachers to orient and to be able to control all these applications. Therefore teachers often resign to using new possibilities of education that computers offer and they return to old and proved way of teaching.

The implementation of new systems has some risks of refuse from teachers because of its complicatedness of control and necessity of demanding learning new techniques and the pedagogic activity itself is being left out and teachers are trying a new system rather than teaching. Therefore the efficiency of teaching stagnates and only few teachers continue using the new system.

Teachers need for their work user friendly systems that are intuitive, easy to use, not expensive and attractive.

The new system MyIMLE (My Interactive Multimedia Learning Environment) which is being developed at the Faculty of Education of Masaryk University in Brno should follow these requirements.

2. MyIMLE system

MyIMLE is a modular system being developed in Adobe Flash, which contains software parts, Flash animations (video screen, animation, applications, etc.) which communicate with each other and they are connected with a HW part via the SW connection module MyCOMPort at the same time. This module makes possible a connection of HW parts via COM port. Thanks to this, it is possible to control (from PC, web page, interactive table, etc.) for example a model simulating causes, behavior and consequences of tsunami, an oscilloscope displaying measured values, or observation of frequency on Ruben’s tube. The number of possibilities of connecting various physical or other laboratory experiments with MyIMLE is almost unlimited. MyIMLE brings a new dimension into these standard experiments – control from PC, better accuracy and other possibilities of data processing, etc.

MyIMLE can bring a piece of reality, which students can touch, control, set, simulate various conditions a observe results, into theoretical lessons. It is possible to process the results using other programs which are available on a local PC and publish them on web pages even with Flash...
animations of MyIMLE system. A lesson modified in this way becomes more attractive and gaining information is more efficient. A student, no matter of what age, is motivated not only to his own activity in the lesson itself, but also to his own interest in the whole topic. A student tends to be interested in the study matter also in his free time which improves his knowledge about the topic.

Fig. 1 Schema MyIMLE connection to hardware

3. MyIMLE in practical education

When a new system is being introduced, the best is to have a possibility to see a practical demonstration in a real class – how the system is being connected, how the system is being used, what it is possible to do with this system and also how the pupils react on this way of education. We will focus on using MyIMLE in classes at different types of school according to the type of study and age of students.

3.1. Primary schools

The clearness of the current study matter is very important for young pupils, older students and also for adults. Nevertheless there is a difference in requirements on the experiment and the on educational process itself. The priority for the small children is to know the topic and to know the basic principles and consequences. It is possible to bring reality to schools using MyIMLE – we can show the children a tsunami on a model, which can demonstrate the beginning, behavior and the consequences of tsunami. Children need to understand what tsunami is, how it begins and why we should be aware of this phenomenon. It is also a good thing to add clips with real tsunamis and their consequences.

MyIMLE makes possible, using a computer, to set the cause of the tsunami with its parameters like the height from which falls a weight to the liquid and then it is possible to let a pupil to start the demonstration. A camera system connected using MyIMLE then captures the tsunami and its consequences on the coast with miniatures of houses and trees. It is also possible to demonstrate an equivalent of tsunami on lakes and artificial lakes when we use a barricade as a dam. The children can directly see the context and they can experiment with changing the shape of the weight, the height from which the weight falls, etc. This leads to a better understanding and remembering the new study matter. The image from the camera system is being projected and zoomed on an interactive whiteboard, so the children sitting at the back of the class can easily observe the experiment. An interactive whiteboard connected to MyIMLE system extends the possibilities of the lecture and improves the clearness of the presentation. It is also possible, using the tools of the interactive whiteboard, to compare for example a clip of a real tsunami with the model of a tsunami. Thanks to this, it is possible to support the imagination of the pupils and to improve their understanding of the study matter. Another advantage that interactive whiteboards offer is a possibility to emphasize the important parts of the experiment or a clip with a real tsunami.

Fig. 2 Preview of the interactive whiteboard connected to MyIMLE

Then we can draw a conclusion of the experiment with the pupils and we let them to process the new information by doing other tasks which follow the study matter.
3.2. Secondary and high schools

It is possible to use the same topic at secondary and high schools. Nevertheless the whole model needs to be modified of more detailed analysis of the experiment. The experiment is being transferred using MyIMLE to a computer screen and then it can be projected or can be exported for example on a web page, it can be printed out, etc.

![Fig. 3. Preview of the interactive whiteboard connected to MyIMLE](image)

If we use an interactive whiteboard for the projection, we can improve the experiment of other interactive functions of the interactive whiteboard – for example it is possible to insert frames of a video to a pre-set graph and we can observe for example the height of the wave depending on the conditions of causes of tsunami – as the power of earthquake, the dimensions of the object falling on the surface of the liquid, etc.

The students then write down the gained data into the pre-set tables and therefore create a form of output data for next work, export or for printing out. It is also possible to observe other phenomena on the model – as a rapid decrease of the height of the liquid level before the tsunami flood. The students can make a hypothesis about chances of rescue and about predicting and protecting the people in endangered areas. This hypothesis can be extent to a “land-use” designing the build-up area on the coast.

![Fig. 4. “Land – use” designing the build-up areas on the coast](image)

3.3. Colleges and universities

Even at these types of schools it is possible to use MyIMLE. The difference will be in laboratory equipment according to the specialization of the branch. Nevertheless this model of tsunami is not suitable for a university study. Anyway MyIMLE system can connect various external devices and therefore it is possible to use it to connect more detailed simulations of various phenomena. The same situation is with interactive whiteboards at universities – because MyIMLE can work with interactive whiteboards and can extend the possibilities of using these interactive whiteboards. There isn’t the most important aspect to involve the students to work with the interactive whiteboard, but a possibility of an illustrative and clear presentation of the lesson topic.

4. Teachers and MyIMLE

This system should help teachers to create a quality lesson with maximal using of laboratory equipment. It isn’t necessary to create new experiments, it is enough to modify them and to connect them with MyIMLE and then to transfer the experiments to a computer screen and to an interactive whiteboard and to extent the experiment of the tools of the interactive whiteboard. Therefore the students can have a better insight into the experiment.

The teachers with an interest in new technologies can have a powerful tool for their lessons. They can create their own system for MyIMLE and to extend, using Adobe Flash, the possibilities of this system. The development environment of Adobe Flash is very universal, interesting and not difficult to learn. The graphic environment is similar to programs meant for presentations and it is possible to control it using an object language. It is possible to create applications from really simple animations to very detailed and sophisticated programs.

MyIMLE is also suitable for teachers, who don’t have experience with Adobe Flash and for teacher who want only to use MyIMLE in their lessons. There are complete software parts focused at various experiments available for these teachers. Therefore a teacher can only use a functional and tested experiment which he can only add to his lesson.

5. Conclusion

MyIMLE system is still on its beginning but the development of this system is fast and promising. MyIMLE, as every new system, will have its supporters
and opponents, but the idea of MyIMLE is very interesting and hopefully will be useful at many schools. MyIMLE can enrich the education and bring a piece of reality to the educational process. There could be also a better chance to involve the students to their own education, to raise their interests, their attention and their remembering of new piece of knowledge.

9. References
