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THE IMPACT OF MODERN TECHNOLOGIES ON ELEMENTARY SCHOOL ORGANISATION AND TEACHING METHODS

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Abstract
This paper aims to assess and explain the importance and impact of modern technologies on organisational and operational level of elementary education system. It analyses and presents the current situation and possibilities, vision, guidelines and strategies of the EU in the field of introduction of modern technologies to primary education.

Proposal for modern primary school teaching methods, with some suggestions for specific solutions and actions, is shown.

Key words: modern technologies, elementary school, organisation

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Introduction
Use of modern technologies in the society require great changes in education systems, including the mission, vision, goals, concepts, contents, didactics, and methods of educational processes, school equipment, organisation of work and educational process, and consequently education and training of teachers, changing working hours and work habits, monitoring of learning process, and evaluation of learning results and other results of work.

Prensky (2014: 25) believes that new educational goals need to be set, we must ask ourselves why we have education, and what is its purpose in the society. The usual response to this is that the education is meant for learning, to achieve what we can measure in different ways. The true goal of education is not learning. Real goal of education, which is “BECOMING”: becoming a good, capable, and flexible person, who will help make the world a better place.

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The fundamental question at the occurrence of new technologies is not how they affect efficiency and quality of classic or current technologically-supported education, but which knowledge, skills, and competences should a modern person at a specific age or a specific level of education have. What should they memorise, what are they capable of doing without any technological accessories, and is it even important?

Slovenia has been introducing modern technologies to primary schools since 1985, but mostly as project works in small, selected groups with the most motivated teachers from some schools, experts from universities and companies. Organisation and teaching classes were not affected with the introduction of modern technologies to primary schools. An additional subject in the schedule, a new employee in the collective and a classroom that was converted into a computer room were the only changes made. The largest improvement was seen in the introduction of modern methods of e-financial management of a school and, partly, in school bureaucracy.

Current projects and, particularly, the requirements of modern education, urge towards reorganisation of the Slovenian elementary school system as soon as possible. However, this would have a significant impact on the school organisation and operation.

The monograph by Zakrajšek (2015) presents an extensive and in-depth study of the problem of introduction of modern technologies to the primary education system, with particular emphasis on Slovenia.

**Methodology**
This paper was created based on an extensive analysis of introduction of modern technologies in the EU and Slovenia and the evaluation of research carried out in Slovenian primary schools.

The first part of the study analyses classic and technology-based education systems. In the second part of the study we examine the latest guidelines and directives in this area in the EU, as well as the situation in Slovenia. In the third part of the study, we compare the proposed model of the concept of modern education with conventional and technology-enhanced education and try to assess what changes in the organisation and method of work will be necessary in order to introduce this model to Slovenian primary schools.
Current organisation of elementary education in Slovenia
Slovenian primary schools perform classic teaching, mainly with technological support and various activities.

Traditional learning
Traditional learning takes place in classic, hierarchically and linearly organised institutions, as shown in Scheme 1, by Zakrajšek (2015: 43) which shows an example of classically organised elementary schools with classic learning and external tests.

The highest entity is the school board; the school is run by a principal who is executing the laid down programme in a classic manner, with a help of assistants and expert managers. The main goal is a successfully modified programme, which can be excellently performed without using modern technologies in classes. Each teacher must have his own contextual and methodical preparations for classes. Since external tests are not mandatory and results have no effect on completing elementary school education, most students do not take it seriously.

Traditional learning is done in specific premises according to specific schedule, communication between teachers and students mainly happens in a classroom. The teacher is head of the process and the main source of information. Learning material is contextually determined and is linearly complementing and upgraded. Everything is predictable and relatively unchangeable; creativity is unnecessary and even disturbing.

Students sit in their seats for most of the time, looking each other in the back, tests are usually performed without technical accessories and with strict restriction of communication between students. Only a few activities, which mostly include classic school topic, include cooperation of students and teachers.
Use of mobile devices is usually forbidden in classic schools. Scheme 1: Classically organised elementary school with classic teaching

Technology-supported learning
Classic hierarchic organisation and traditional learning is most commonly used in Slovene elementary schools as well. Modern technologies are being introduced, but the concept and contents of classic education system are not being interfered with. Scheme 2,
presented by Zakrajšek (2014: 45), shows an example of elementary school organisation with technologically supported learning.

Scheme 2: Classically organised elementary school with technological support (Red ellipse shows the difference from the elementary school with classic literature.)
It is technologically-supported education where introduction of modern technologies brings a relief from some administrative tasks (office operation, school diary and grade book, notifications, etc.) or enrich classes, and replace former less useful and more demanding devices from the literature point of view (overhead projectors, TV-projectors, computers, CD, DVD, etc.), or groups in social networks or video calls and similar.

They perform the curriculum in a classic manner, and some teachers use modern technologies, even e-classrooms. The main goal is a successfully concluded programme which can be excellently performed without using modern technologies in classes. Each teacher must have his own contextual and methodical preparations for classes, and anyone who wants can use modern working methods along with the classic ones, but this usually means additional work and stress for both, teachers and students.

Classes are performed in specific premises and according to specific curriculum.
Only a few activities, which mostly include classic school topics, include cooperation of students and teachers. There is more cooperation for teachers who are introducing modern forms of study, but students are usually more burdened and are often refusing this study. Some teachers who use modern classes usually receive negative attitude from colleagues who see that learning in an interesting and efficient way is possible, but it needs much more work and knowledge.

Communication between teachers and students mostly occurs in the classroom, some also use modern communication forms outside the classroom. If not forbidden, use of mobile devices replaces communication which classic organisation does not enable. Classic teacher is a process manager and the main source of information and a modern teacher presents students with other sources as well. That is why there are two types of students in schools. Modern education is not available to the first and the programme does not even require or promises it.

Classic learning material is contextually determined, linearly complemented and upgraded. Some also use e-literature, which is usually outdated since no one revises it. A few teachers have their own e-classrooms with literature where authorship is usually not settled and is often technically and format-wise incomplete. Everything is predictable and relatively unchangeable. Different technical accessories and literature are usually used in minimum extent for most teachers since the
classic approach prevails - lectures, writing notes, practical exercises, and numerical testing - which does not require the knowledge of using modern technologies. If the school is lucky enough to have a few teachers that are using modern teaching, this can diversify school work; if many teachers use e-classrooms, this brings a large additional burden for students and differentiation of subjects, differences in vision and work methods of the school; a significant disturbance and usually a negative effect on school work.

Such school usually has an expert due to higher use of technology (teacher of computer sciences, but they have no competences for modern technologies) or even a team for computer sciences or teaching methodology, and students often use dedicated classrooms. Elementary schools with good technological support usually have many activities which include modern technologies, and also a segment of multimedia production.

In such education, students use external sources and social networks more often, but they cannot use them on a larger scale for learning in a sensible and useful manner as this is not included in work concept. But students do acquire modern competences in this type of work. That is why students evaluate the school as obsolete and burdening as they use a lot more time than they would otherwise, and for a lesser effect, and the elders evaluate that the youth spends their time on a computer.

One of the most esteemed critics of classic learning Prensky (2014) believes that the current education system is based on individual subjects, but it does not consider the relations, attitude, and achievements. These can only be achieved by introducing real subjects and projects for students to work on. All these contents are now only being added to existing contents in classic learning, and the same applies for technological support. That is why programmes are too crowded, students overloaded, and they do not receive the required knowledge, skills, and competences, and are not satisfied with education. In most subjects they will be learning things which will not be useful to most of them later because some skills are being developed indirectly, instead of being developed more directly, but with less effort and time spent.

This happened in a Slovene elementary school where they introduced many optional subjects and contents because of the interest of children and parents, but they are mostly inactive due to small groups, instead of changing the basic subjects and activities and providing contemporary knowledge to all students.
Current curriculum contains many unnecessary things; students are acquainted with a lot of information, but practical work is non-existent, that is why they lose themselves in the flood of information. Since these items are not related to actual situations and real life, and since the youth are not motivated, they do not even believe that they will ever need or use what the school is teaching them. At the same time, the school system does not provide key knowledge, skills and competences. Trends and guidelines in the field of modern education in the EU and Slovenia Action plan of the Committee Technology and Open Educational Resources as opportunities to reshape EU education (2013) and document Open Education Europa (2013) was the most important documents.

In this action plan, the activities were focused on three main areas.
1. creating opportunities for innovation for organisations, teachers, and students;
2. expanding use of freely accessible OER – Open Educational Resources so that learning material from public financing would be accessible to everyone;
3. improving ICT infrastructure and connectability in schools.

There are opportunities for innovation in education institutions within this programme, especially for possibilities of using free-accessible sources for improving information-communication technology (ICT) structure.

Activities related to action plan Open Education are financed by the support of the new EU Erasmus+, research and innovation programme (Horizon) Obzorje 2020, and with EU structural funds. The Education Development Plan was also adopted by UNESCO (2013). The provided information is interesting as it shows trends and plans in education in the world, the tasks that less developed countries will need to perform in introduction of modern education, and also the possibilities that developed countries have in order to help and cooperate.

Slovenia has adopted this document, which was partly included in documents and projects. In 2014, the School bag of 21st Century project in Slovenia, Flogie, Mohorčič and Bonač (2014: 67-74) was presented. The goals of this project and related priority fields are:
- development of modern e-services for Slovene education space;
- development of e-content (e-textbooks) for social sciences (8th, 9th grade of elementary schools, and 1st year of gymnasium schools);
- assuring accessibility and support for the newly developed e-services and e-contents;
- development of a unified user interface for ‘online’ preparation of e-contents;
- development of a unified platform for accessing e-contents - ’eduStore’ (e-textbooks, e-books, etc.);
- development of e-services for using developed e-content on various clients;
- establishing and development of infrastructure (switch to IPv6, SIO II, and pilot projects);
- execution of pilot projects for using the e-school bag (that cover pedagogical-didactic part, as well as organisational-managerial part of each education institution or establishment);
- evaluation of effects.

Pilot projects of using modern e-services and e-contents on tablet clients in education institutions will be based on experience of innovative school programmes called Partners in Learning, which is running in 64 countries world-wide (http://www.pil-network.com/pd/school), project Innovative Pedagogics in the Light of Competences in the 21st Century, and on e-Competent Teacher Standard, which was developed within the e-Learning project.9

**Introduction of modern forms of teaching to Slovenian primary school**

Modern, technology-supported education, offers two basic options: combined and e-education, but elements of both forms are usually used in practice.

**Blended learning**

Blended learning is an intermediate level between technologically supported learning and e-learning. Example of elementary school organisation with blended learning is shown in Scheme 3. by Zakrajšek (2015: 48).

The main and the connecting element of school operation is the education platform, which is prepared and maintained by a national institution for all schools. For each subject and basic activities, the platform has web classrooms where learning communities are being created.

Schools and teachers may adapt or personify (upgrade) individual classrooms, and the best solutions are used for updating the platform.
A large portion of acquiring, verifying, and also evaluating knowledge is done through the platform, and contact hours are done in form of interactive workshops, and are intended for discussion, practical exercises, research and development work, and acquisition of knowledge, skills, and competences from fields that each citizen needs in their lives for which the current school system predicts they come across in everyday life. Learning with e-platform is based on the
requirement that students are prepared for every contact meeting, and to review, upgrade, and strengthen the learned contents in a group with the help of a teacher.

There are many ongoing activities and projects within the e-learning platform, which school can prepare by themselves and offer through joint education platform to other schools and abroad. Local experts are also included in these activities. Each student has to attend some activities, and some are optional.

The highest authority of the school is the school board, and the principal manages the school with assistants, teachers, tutors, external experts and technical staff, they perform the curriculum in a manner that is largely adapted to individual students. Goals are being updated every year. All teachers must use e-classrooms, they can upgrade them and have work autonomy during contact hours. Consequently, there is no confusion, lack of clarity or discrimination. Since subjects and activities differ, e-classrooms also differ, but the entire concept is unified.

Elementary schools with blended learning have to manage the entire work process (administration, teaching, activities, contacts with parents and locals, library, external connections, and other) through education e-platform.

Main goals of the elementary school programme in blended education system are successful completion of the programme and mandatory external evaluation of modern knowledge, skills, and competences, depending on age group. Each teacher has an e-classroom available for their subject, they can also personify them, and they spend most of the time for interactive work with students, during contact hours and in e-form (discussions, practical work, projects, evaluation of knowledge, skills and competences, etc.).

Distance learning can be done from any location (even from a school if students do not have suitable equipment and connections at home) and at any time apart from activities that are time-related. This allows greater flexibility of learning in relation with other student activities.

Contact activities are held at specific hours in specific places (school, cultural institutions, museums, sports halls, etc.). Each activity runs for several hours and has all the required phases; the basic preparation is usually done through e-classroom.
During contact hours, students usually do not sit in classic school benches and look at each other's back, but use active work forms, evaluation of knowledge is done in different manners, and there is a great emphasis on using modern technologies and group work.

Communication between teachers and students is done in different ways and throughout the year, which also means afternoons and weekends - whenever students require certain information, result, advice, help, etc. Use of all available technology is permitted, special examples are agreed on in advance.

Teacher is the leader of specific activities, director, and counselor, while e-platform with links is the main source of information, alongside classic sources.

This type of school should have a professional who maintains the operation of the platform, mostly by entering and processing data. In case of a multimedia centre and preparation of additional multimedia literature, the school must work with experts who may also be mentors of individual activities.

Blended education system provides quality and rational use of modern technologies, which means that students do not waste as much time in social networks and virtual worlds.

Blended learning will probably be the most suitable for Slovene elementary schools in the next decade, and activities running in contact and e-form will need to be determined since the majority of quality education, training, and mentoring has to be spent together in this age group.

**e-Learning**

Bregar, Zagmajster and Radovan (2010) explains e-Learning as a type of education where a student and a teacher are spatially separated. Communication is usually done through the Web - teacher presents literature, directs the process and evaluates teaching results, and the students are mostly learning by themselves. Learning is done using Web, virtual classroom or by emailing various literature, access to databases, and similar. Participants may occasionally meet in person, but it is not necessary.

All instructions and literature is permanently available online, and can be or should be constantly updated. e-Learning provides learning that overcomes traditional methods. Literature may also be used
independently or for several classes, e-learning also enables cross-curricular links.

Technological support is included during the entire education process and not only during individual parts as applies for technologically supported learning. Personal contact between lecturers and students is reduced, but this can be substituted with modern technologies in certain extent. Communication can be individual, time-adjusted, and spatially independent. Experience shows that help and control by parents or mentors is required for successful distance education in elementary school.

By Garisson (2011) e-Learning requires very active planning and work by an educational organisation, which must provide technological support and human resources for learning process. This means preparation of the programme, time-table, e-learning platform, literature, teacher agreements, and execution of the programme with final evaluation of knowledge, skills, and competences.

Numerous sources describe problems in introduction of modern education in different countries. One of the most known sources is the one below which describes errors in the decade when e-learning was introduced most intensively and without suitable experience. Simple answers for complex problems are given by Nivala (2009: 433-448) and E-learning initiatives that did not reach the Targeted Goals are presented by Keegan (2007).

**Proposal of a model of contemporary Slovenian education system**

Scheme 4 shows a proposal for organisation of a modern primary school system in Slovenia by Zakrajšek (2015: 75). Scheme 4 shows that elementary schools fully depend on national institutions regarding the curriculum; that is why they are crucial for upgrading elementary education in Slovenia. Elementary schools have certain freedom only in activities and the way the classes are performed.
Scheme 4: Proposal for organisation of Slovene education system for preparing and executing a modern blended learning in elementary schools

It is also quite obvious that the state should prepare the literature and learning platform since it insensible from the technical, and even more from a financial position and a position of human resources for each school and teachers to make this effort by themselves, but they can
Innovative Issues and Approaches in Social Sciences, Vol. 9, No. 1

contribute their share in developing the system and literature. Schools and teachers should essentially be dedicated to working with the youth and cooperation with specific environments.

We are starting from some assumptions for suggesting a strategy of introducing blended learning in Slovene elementary schools. The state should:
A. Adopt a modern vision of Slovene education system.
B. Adopt the model of blended learning in elementary schools.
C. Prepare an updated curriculum for elementary schools.
D. Prepare a modern and mandatory external evaluation.
E. Adopt modern school and work legislation.
F. Provide nationwide e-learning platform with all e-classrooms for subjects and activities, and complement it yearly in cooperation with schools and publishers.
G. Provide elementary schools with regular resources for equipment, connections, and access to databases and other bases and literature.
H. Provide education and training of principals, teachers, and technicians.

Suggestions of conceptual and contextual solutions in individual activities are presented in individual chapters of this monograph, and each line is a separate sub-project in the project of complete modernization of Slovene elementary schools.

Throughout the project, we must be aware that modernization of Slovene elementary schools is not possible without suitable solutions from the top, which is from the Ministry of Education, Science, and Sport (who must also be the initiator of modernisation). The schools will be able to provide their specific goals and tasks to the system and they will also be able to modify and constantly improve the system. If the state will not act, the only real option is to partially familiarise the youth with modern technologies within activities, particularly those in multimedia production.

**Conclusion**
This article presents some theoretical and practical solutions and a suggestion for a concept with modernisation strategies for elementary school curriculum. Beside results from Slovene and own studies, we have paid great emphasis to results from international studies, and to recommendations originating from them, to many agendas, plans, projects, and actions planned by or proposed mostly by the EU and UNESCO, and to some other internationally most successful projects. Results from the paper have confirmed that modern technologies have
great or key impact on global changes and on education system and that speed of their introduction will greatly affect competitiveness of countries and their citizens in a global world.

Introduction of modern technologies to education system is not only about technological support to classic education system as it is most often and mistakenly evaluated, but it is about learning new things in a different, more effective, and more interesting manner. Participants of the education system must acquire new, modern competences that are not available in the classic way.

Rapid changes are happening in elementary school education, mostly for children entering elementary school as many of them have several positive experiences with using modern technologies, mostly tablets and mobile phones and these devices already represent a door to information, but mostly to cartoons and games. All this knowledge can and should be properly upgraded and used in elementary school. On the other hand, there are students who did not have access to these technologies and possibilities, which require additional skills and actions from teachers. Inclusion is often tightly related with this as new technologies and blended learning allows it on a greater scale than classic learning.

The finding that tasks are related to thorough changes in the mission, vision, ways of thinking and working, suitable norms, legislation, and finances, is extremely important. All this represents a great obstacle for modernisation of education system. Due to expected changes in the upcoming years, the curriculum of modern schools should be prepared in a way that enables constant modifications, and that reforms are not needed as such manner of changing the education always delays the progress for several years or even decades, along with many structural, organisation, financial problems, problems with human resources, and other issues.

Solutions are known, and many beginnings and model drafts are prepared; all this enables a relatively quick modernisation of the elementary school curriculum. The key positive element is that the youth is looking positively on modern education, and this gives a significantly greater effect and modern knowledge, skills, and competences.

**Resources**

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UNESCO: Available at:
