THE INTEGRATIVE FUNCTION OF MODERN DIDACTIC AIDS: FROM TABLE TO TABLET

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Review paper

Abstract

In this paper we present, in a specific way, a historical review of teaching aids that are transformed through new insights and innovation. This transformation revealed structural changes in two parallel lines in time. One describes the possibilities of didactic resources that began with tiles that have been written on and which were developed to highly sophisticated equipment for the same purpose. The other describes a permanent record from papyrus, via Gutenberg books, to IT technology. Therefore is described a parallel world of two elements of long-term literacy of a man (write-erase, remember) that even nowadays merge into a superior electronic apparatus - a tablet. It is obvious that such integration is a kind of revolution in the educational area.

Key Words: *education, writing, books, innovations, integration*

Introduction

Today's world is a result of man's development from its inception until today. But in order to possibly consider these results, i.e. Today's world, we must be aware that it exists with the help of several important parameters of which are some of the increasing interest in this work. First of all, there is learning as a basic process in nature. Regardless of the period in the life of a man, he is always discerning! Also, regardless of the manner in which such cognition, in the sense that it was by accident or on purpose - he is discerning! Therefore, one could say with certainty that man, as it is today would not exist if he wasn't discerning! Simplicity of these processes logically had complicated situations adequately and allowed the man further progress, in fact, creating a continuous loop which is creating, expanding and enriching the knowledge base moving forward at the same time "in width" and "up" i.e., "to continue" in the cognitive continuum (Bonacin, 2005). Likewise, in accordance with the natural rules that integrate the world around us, and the rules of society that formed the man that knowledge is transferred to the other. The idea is that this knowledge is transferred to all members of society, but the emphasis is still always on new generations. So, the next parameter which we must take into account is the transference of knowledge. The very process of transferring knowledge passed the whole range of "heaviness" from the simplest form, in which the "man reacted to the level of instinct, innate mechanisms that were keeping him alive and the process of knowledge transfer relied on one of the most important mechanisms - the need to play" (Huizinga, 1949), all the way to modern systematic education as socially conditioned process, which also means that the teaching process, as a way to conduct education also passed a thorny path. However, the third parameter which we must take into account is the implementation of this knowledge in practical terms, respectively the realization, the use or performance of a specific plan, model, design, standards, algorithms or politics (www1). In the scientific area, and to this day there are differences between theory and practice (which, in this case, the implementation was), but the only logical conclusion is imposed - no theory without practice and vice versa. Only by integrating theory and practice through knowledge transfer, man receives certain, desired results. So, when we have transferred and implemented knowledge training and transferring of knowledge, after some time we have to think of innovation. Because like it or not, the world is changing. Constantly. Likewise, changes a way of knowing, a way of transferring, way of implementation and that innovation plays a special role. As already pointed out, systematic education is a socially conditioned process. As with education, the teaching process is like any process liable to development. This directly means that in him, according to some historical and socio-technological aspects, innovations are introduced with paradigms. They have to be introduced, so that the society promotes and develops in accordance with the already mentioned findings. In accordance with the foregoing considerations and the studied varied literature, and on the basis of self and others, believe the experience, I came up with the idea that in this paper I offer a brief overview of certain technological achievements i.e. innovations in teaching that would be touching known historical limits, as in the past so in the future of which is the origin title. Well, first of all it is necessary to specify some basic concepts, processes and individuals in this particular area.

Methods

For the purpose of this work different literature was studied and researched, as were different authors from different areas. The insight obtained in such research led to thinking about the fundamental things in education, in particular with regard to innovation in teaching as one important factor of progress in the field of education and knowledge transfer.

The subject, object and purpose of work
The paper focuses on modern technological aids (innovations) in the classroom and their deep roots in the centuries-old teaching processes. The aim of this study was to compare and review some technological aids in teaching throughout history. The purpose of this work is to achieve some knowledge and, based on them, proposals of potential for further improvement of teaching.

Working methods
When creating this work, the data was collected by researching relevant literature from different areas and using different media, and are used methods of description and comparison of the collected data and graphical representation.

Basic concepts and processes
In order to adequately develop the default theme, or defined objective, it is necessary at the beginning, at least tentatively, to define the basic skills, concepts and processes on which the work is based.

Teaching
There are different definitions of teaching but above all it must be emphasized that this is a process and as such, is subject to change. In addition, teaching as a concept can be viewed from different areas with different aspects but the truth is that it exists in a system that seems to be the following way: there is a company that wishes to convey its value, there are competent authorities (Government, Parliament, the Ministry of...) which legally define this transfer and financial support, there are institutions (schools, universities, institutions...) that are responsible for the process of transferring values, there are individuals (teachers, professors...) who have the knowledge and commitment to systematically transfer, there is matter (knowledge and socially acceptable value) to be transferred, there are conditions (space, equipment) in which or with which the process is carried out and there is a person (the student, individual ...) where such material is transferred.

As seen, most likely the origin of innovative ideas is basically where the concentration of knowledge is largest and between teachers of the competent authority. After all, some of the innovations can be started using without the competent authorities of the certificate. Of course, for some innovations, their actual origins may be elsewhere e.g. with exceptionally talented individuals - students or even high in the education system. However, one could also say that the definition from Wikipedia is quite nicely worded and says almost the same thing. Teaching is a key determinant of didactics, a branch of pedagogy that deals with theories, ideas, principles and guidelines that target the successful implementation of the educational process (www3). As a baseline didactics, teaching of organized institutional and non-institutional interaction creates effort in overcoming the prescribed content and the acquisition of knowledge, skills and habits and training of students for further ongoing work (www2).
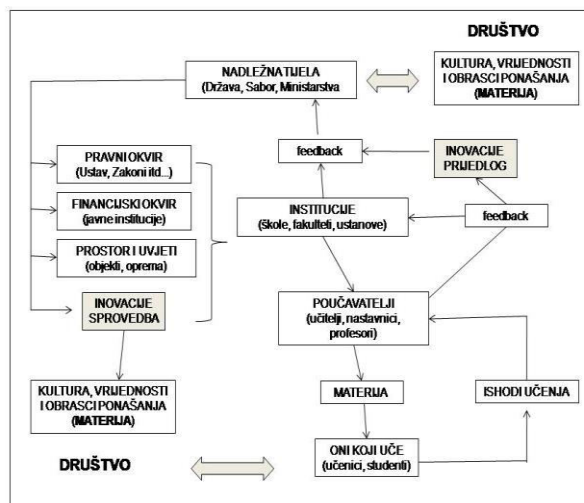
Picture 1. Possible origin of innovations (source: the author)

The aim of the course is to create an educated, humane, free, autonomous, creative, critical, multicultural, multi-religious and multi-ethical student's personality, which is open to all current and future progressive change in themselves and the society in which it is located.

The components of this system are: the student who learns acquires the relevant experience (gets trained and educated), teacher (who teaches), course content (the basis on which the learning is based), objective conditions (facilities and equipment), and the interaction between the participants. During the teaching process the teacher selected mode (method) exposes students teaching material and it gives them different tasks. This teacher's activity more generally called teaching.

The teacher selects and prepares the sources of educational content and methods of displaying them with the intention to facilitate the students understand and learn the subject material. Students actively observe and carry out tasks with a view to adopting the program of specific knowledge, skills and habits. Students learn in courses. (Www2).

Planning and preparation classes
Planning is primarily done strategically and hierarchically from the highest levels where (depending on the country) there are different national curricula, framework plans and programs, school curricula, by School curricula, statutes, regulations, etc., until a specific operational plan and program for individual and subject to certain age written on the basis of research and knowledge of before and in accordance with the laws of the area. "Lesson planning is a vital part of the process of teaching and learning. Proper planning of educational work will allow teachers to be well organized and focused, and will enable students to learn more, and achieve the set goals easier and faster. Well prepared teachers will be able to easily cope with unpredictable situations that may arise during the implementation time and learning activities.

When planning teachers integrate the requirements of the existing curriculum to the characteristics of children and class, their prior knowledge, abilities and interests, they create more opportunities for creativity and exploration, independence of children and the development of generic (universal) competence. Plans should take into account individual characteristics and development of each child's different learning styles and abilities, and be flexible enough to be able to change and adapt as needed.

Children, families, and relevant professionals need at a certain level to be involved in the process of planning, monitoring and evaluation, to the development and learning was synchronized and supported. Planning is a cyclical process, which requires constant reflection, monitoring and questioning, and includes systematic observation and other strategies formative monitoring and evaluation, to the method, content and dynamics of the customized development and learning of every child.

The planning process certainly is one of the most complex tasks of teachers; it covers all aspects of the teaching process, and requires different skills and experience. Therefore, many teachers are in planning teams to jointly come up with the best ideas will then adjust their classroom and examine the practical realization. "(CEI Step ByStep, 2013)

Management and the teaching hours
Lesson in principle can be an hour of learning new material, hour repetition, and trial. There are also combinations. This type of clock is dependent on the goals in a certain period or on a thematic whole, the type of teacher democratic (allowing communication), authoritarian (does not allow communication or not too much) and liberal (allowing too). It also depends on the applied methodical approach (principle frontal work, work homogenous groups, project work etc.). Furthermore, in connection with all the above, the clock has a structure that generally looks as follows: Opening or introductory-preparatory part, the preparatory part, the main part A, the main part B and the final part.

The idea is to load curve for an intellectual to reach maximum in the main part of the hour, the emotional towards the end of the hour and motivational at the beginning or in the preparation part. It takes emphasis and importance of prior preparation of teachers.

The class atmosphere and discipline
The class atmosphere and discipline belong to the same psychological-pedagogical area of working with children. It is not possible to establish an adequate work environment with a lack of discipline. And vice versa. Disciplining students will be much less pronounced when working continuously on adequate atmosphere.

The evaluation of students' progress
Evaluation generally belongs to the field of docimology and generally can be evaluated two things, status and progress. However, progress cannot be assessed without information about the two states, which means that such a task is extremely complex and requires exceptional consideration. In addition, when assessing the used standards and norms of what is normal or should be taken of the numerous variations that affect the final result. Also, be careful of the fact that at different ages require different outputs (output) and is in a particular age expressed store data, in another emphasis is on linking i.e. Creating relations between data, while in a third generally higher age emphasis on the syncretism that is, integration and sometimes creating integrative model (Bonacin, 2016).

Review and evaluation of your own teaching
Self-evaluation of teachers is a special category because it cannot be fully separated from the assessments of superiors (director, professional combat, inspector) as well as those for which it is responsible (pupils, students), and more recently even the interested public (parents). Therefore, assessing the quality of work the teacher bring at least these three social structure and sometimes fourth i.e. other teachers in the school.

The real problem and a serious task is to perform self-evaluation with these four possible evaluation subsystems, and not to say that sometimes the fifth, the only authoritative and that is the final score. It is obvious that none of these evaluations may not be fair but the question is how such objectivity can be sought from the teacher because the estimates themselves. In order to at least largely make such a credible assessment, should start from the purpose and role of the teacher and that is to teach children. While the number of children to learn from other sources (books, parents, internet, etc.) Final result signed by teacher and responds to it. Consequently, self-evaluation can check and confirm the default Finan grade of students and their knowledge.

Innovations
What is generally told about innovation? Innovation is the application of new and improved ideas, procedures, goods, services, processes that bring new benefits or quality of the application.

Innovation in the wider sense make improvements in processes, technology, organization of work or business, marketing, services and so on. If we focus only on the market to define innovation, then the conditions of fierce competition and saturated markets companies that do not innovate -they stagnate - stagnation is an introduction to extinction.

As for today's world it is perceived through the prism of the market, which means that innovation is any intervention that reduces inputs, i.e., production costs and administration, increasing productivity or use of equipment or time, improving the quality of products or services, increasing security, reducing scrap, improving placement, etc.. . or any measure that leads to an increase in competitiveness (www4)

Previous studies

The Romans wrote with a "pen" that resembled a twig, which was made of bone and could easily erase typing mistakes, and wrote on "paper" made of wax, and more wax sheets are usually imported. The first real book appeared in the East. The oldest of Chinese books were made of bamboo slats, and later replaced with coils of silk. Babylonians, Assyrians and Persians imprinted wooden stick signs in soft clay tiles which then dried and baked. The ancient Egyptians wrote on wood and stone, and the scrolls of papyrus. Pith of papyrus was cut in narrow ribbons that were crushed and taped to one another and thus were received wide leaves that were combined into long rolls. The ancient Greeks and Romans had a different book. The famous laws of Solon, the Greeks carved in wood panels and Roman laws were engraved in the 12 stone slabs. In everyday life, the Greeks and the Romans used to write on wooden tiles that had been coated with black wax. Several of such plates are connected to a ribbon or a metal ring in a book. In the wax they made letters and signs with a metal or bone pen called the stylus, which today makes style a writing method (www5) http://memorylimit.blogger.ba/arhiva/2014/08/30/3705118
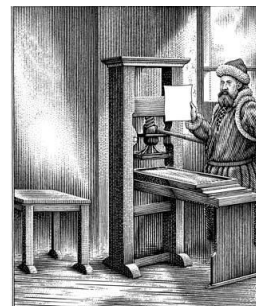
Picture 2. Sumerian inscription
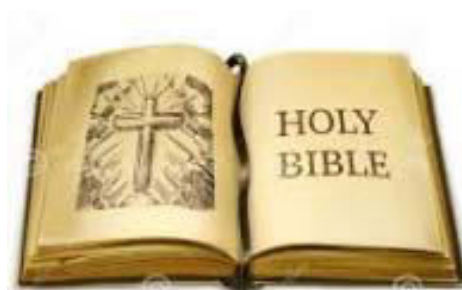
Picture 3. A style of writing

Picture 4. Egyptian papyrus

Picture 5. A tile, chalk and a sponge

Picture 6. Guttenberg's book printing

Picture 7. A modern book

"Pointing to the principles of selecting and processing of certain issues in the field of innovation in teaching, dr. Peter Mandic says: In selecting and processing innovations, which includes this book, we are guided by the following: that somewhere in the world it is experimentally proven to have made relatively positive effects in rising the quality of teaching that can be more experimental in our conditions and massively applied in our schools with reasonable financial and other investments.

Among the many innovations that exist in the world, we have chosen, guided by the above principles of a modern individualized teaching, individual lessons planned, no school class, dual plan of progress, team teaching, electronic classrooms, computer classes, and a flexible schedule of classes." (Mandic, 1980).

As the author states, by the time the book was written, until the '80s, there have been a number of innovations in the organization, implementation and verification of educational activities in schools and other educational institutions. Most of them were directed towards modernization of resources, forms and methods of work, the adjustment of interests and possibilities of students, due to the explosion of knowledge, modern technology, electronics and cybernetics.

Picture 8. An electronic tablet

The emergence of mental (mental) and conceptual map i.e. Techniques to visualize connections between different concepts. A conceptual map is a diagram that shows the relationship between these concepts.

Picture 9. A mind map as an innovative way of thinking

Discussion

The history of mankind is marked by many activities and many philosophers make many of them marked as unacceptable, desirable content, improper, necessary and otherwise. In all this, there is only one activity evidently always been extremely positive and focused exclusively for the benefit of humanity, even with the adoption of possible short-term deviations. This activity is called education, education. That the total knowledge of mankind is in static categories, then of course is needed constant repetition of the same material, i.e. the transfer to the next generation.

Knowledge of the human race, however, is constantly increasing, reorganize, and restructure, which means it is an extremely dynamic category. Such dynamics and improve education absolutely would not be possible that from the very inception of the training was not innovation. Innovations were, are and will always be a step forward in education and since education is the foundation of everything else, and then in the general civilizational and cultural development of mankind. And that context is implanted, a small technological assembly which can be followed for a long time and this from the very beginning literacy. The transfer of knowledge can be done by transferring the story "from generation to generation," which is a good

way of transfer but is much better with proper records. Some of these records showed the so-called. Monumentality that is characteristic of long duration (hieroglyphics, etc.) but it was questionable how many there were people could understand at the time of their creation, even though they were visual letter. Something similar happened with the calligraphy of the Far East as a result of pictorial letters and presents artificial expression of the same. The emergence of phonetic letters changed the communication between people and especially the models of knowledge transfer and even schools. The biggest changes in this respect were manifested in the possible availability of broad categories of individuals. Phonetics opened the possibility of learning the maximum width, and opened the doors of learning language and script at the lowest level of education, i.e. with children.

Standardized symbols are standardized voices and word formation has become a key part of modern literacy. An interesting development of students' fit exercise since the Hellenistic era and even earlier. Of course the students should write tasks and "to continue", or the technological question was how to implement it. In any case, it was clear that such records everyday and educational, will not preserve the monumentality and disappear almost just when they are created.

Cases are known where there was printing of symbols with a sword or a stick in the sand by the wind / sea quickly wears them out and also marks that already the first rains washes out. In these situations, the real problem was that it took a huge amount of space, usually unprotected from weather conditions, however, was confined to a relationship with the selected individual, i.e. the special relationship student - mentor (The ancient Greeks, China, etc.). In regulated systems of education that have appeared already thousands of years ago has grown, the need for possible printing symbols and drawings for educational purposes in an educational institution, while mass possible participation and for purposes that are very short i.e. practice.

In that sense, perhaps the oldest known stone tiles fall of Ancient Egypt. On them is written and drawn with charcoal and a variety of colours derived from plants of diverse and with which such a record could, if necessary, delete. One of the first (though not the only) help from ancient times, certainly the plate, basically a wooden board, on which was written the subject of who was leaving a trail.

In later times the tile is painted, usually green and the subject was chalk, and the purpose of removing the records used to sponge, both with a rope tied to the plate. In this way it was possible to ensure that all students have in themselves help to assist them in the adoption of literacy, but also the mathematical form and course of graphic design. Such a plate with all its deficiencies (from today's point of view) was phenomenal innovation that all students approached expression in at least three aspects: literary, mathematical and graphical.

As time passed and the transfer of knowledge, and of course school education in general, progress, and so are helping to change its character, technologically perfected and took on not only a new look but also new features. In parallel with this development, it is possible to monitor and another dimension of literacy, but still substantial bit different. As was seen, the Egyptian stone and antique wooden tiles were such that the record could quickly remove and create a new one. At the same time, the latter said line literacy represents the achievement of a permanent record that cannot be not quickly create and certainly not quickly removed. Here we are talking about an ancient Chinese paper documents, Alexandrian rolls, parchment records, medieval hand-written books with initials via Gutenberg press to the present textbooks.

In all this, it is evident that the separation of these is both of permanent and temporary record, although both are undoubtedly represent and are exceptional innovations that are used everywhere where it is needed of course and in the classroom. At the end of 20th and beginning of the 21st century, the development of technology has enabled the incredible development of electronic resources that are perhaps best embodied in the so-called. IT (information technology).

It is this time after the boom of computer technology has brought a new and these are devices whose properties are excellent communication skills, extremely low weight, excellent resolution, the huge potential of storing, very easy operation and all together, nor the size of a small book. To the technological wonder called tablets and is able to serve as a phone, can be connected to the Internet network (which will liaise with the whole world), can display high-resolution images, the memory space can cram an entire library and what you can not fit to retrieve any memory devices were internet (finally students are relieved of carrying bags of 25 kg), but if you really want, you can organize virtual online classrooms in which it does not matter where the student specifically. In this way, for the first time in the history of the human race and even education, in a travel aid integrate the two lines of innovation, namely: a permanent record (e.g. books) and a temporary record that can be deleted (such as exercise). Not to say that the educational material via the Internet is virtually unlimited and that the exercise, work, homework, etc. can be sent directly

to the teacher or any responsible person. Possibilities of expression, learning, creation and other forms of student achievement significantly increase, as well as the credibility of learning outcomes and teacher as leader of the entire concrete process can be given to the core of why he had trained. Tablet thus becomes a true window into the world of a child / student with tremendous opportunities to the consumption of content and personal content expression. The teacher was so transformed from the former "learn" the moderator of the entire process aimed exclusively at students' well and thus to contribute to the school, immediate community and the common good. This of course means the need for innovative training to staff schools, which will obviously be needed for some time, not only in terms of use of tablets.

Conclusion

The conclusion of this work can be directed to the previously-discussed technological aspect. Also, according to the most important participants in the process, i.e. learners, it is also possible to superordinate systems and as well as a teacher. However, what is characteristic of all these aspects is the need for adequate monitoring of cultural-civilizational and technological changes around us. These changes are such that they sometimes need to be without any thinking accept and sometimes without any thought to discard. Between these two extreme positions should always be good to think, to weigh the pros and cons and determine according to the news and therefore the possible innovations that time brings. As the old Latins would say: "Tempus Omnia Habet".

In each case, including the tiles and as a tablet, and the time will always determine the degree of application of technology in everyday life, it is sometimes possible to delay paying very expensive. The actual integration of positive technological innovations i.e. Innovations that may not be for the exclusive technology, it will not happen with or for students themselves, either with or because teachers themselves, and no code or due to superior authority, but as always in training to be determined by the degree of acceptance innovation on human schools. This is the place from which innovation will go in life and be actualized in full measure. All other innovations as well as their origin may or may not be real and universal and therefore neither permanent nor universally accepted.

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INTEGRATIVNA FUNKCIJA MODERNIH DIDAKTIČKIH POMAGALA: OD TABLICE DO TABLETA

Sažetak

U ovom radu se na specifičan način predstavlja povijesni pregled didaktičkog pomagala koje se kroz nove spoznaje I inovacije transformiralo. Ta transformacija pokazala je strukturne promjene kroz dvije paralelne linije u vremenu. Jedna opisuje mogućnosti didaktičkog sredstva koje je započelo s pločicama po kojima se pisalo I koje se razvilo do visokosofisticirane opreme s istim ciljem. Druga pak opisuje trajni zapis još od papirusa, pa preko Gutenbergovih knjiga, do iste te IT tehnologije. Opisan je, dakle, paralelni svijet dvaju elemenata dugoročne pismenosti čovjeka (piši-briši, pamti) koji se I u današnje vrijeme spajaju u vrhunsko elektronsko pomagalo – tablet. Očito je da takva integracija predstavlja svojevrsnu revoluciju u edukacijskom prostoru.

Ključne riječi: *edukacija, pisanje, knjige, inovacije, integracija*

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