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Digital Literacy in the Help of Education

Introduction

The field of education has always been an area of interest for many researchers and theoreticians leading to expanding developments. Herbartianism, Constructivism, Behaviorism and other approaches in education were in the core of educators and teachers in the past century. Education theories were developed by different theorists like John Dewey, Jean Piaget, Lev Vygotsky, Pavlov, Jerome Bruner, etc.

Nearly a century ago John Dewey (Dewey, 1938) laid out a progressive new approach to education. He believed that experience is the best education and created a system that would focus on learning-by-doing. If Dewey believed that all education is experience, then Lev Vygotsky (Vygotsky, 1978, 1986, 1997) believed that all experience is social. It follows then that all education is social (Wagner, 2008).

Jean Piaget (1929, 1950, and 1952) introduced the constructivist concepts of assimilation and accommodation, which describe the way students construct their own meaning as they experience the world. Jerome Bruner (1966, 1971, 1986, 1990, and 1996) built upon the constructivist philosophies of Dewey, Vygotsky, and Piaget as he explored the process and the culture of education (Wagner, 2008). Likewise, as the leading figures of the contemporary education field, teachers should involve their students in active dialog and encourage their students to make their own discoveries (Bruner, 1966, 1973). All in all, it is widely accepted that humans must construct knowledge when engaged in social activities (Kim, 2001).

After the great innovations and developments in computer technology and software engineering, a great jump of their use in education was observed in the past decade. ICT became a tool for life. Some theorists like Andre Giordan (Giordan, 1995) claim that we should think beyond constructivism. The contributions, reforms, discoveries and works on education of the theorists mentioned above have great importance in the field of education. After the new challenges of the 21st century, the new birth of some breath-taking discoveries of new education models, strategies and methodologies will not surprise the new generations with contributions of the innovations in technology. Moreover, science education and especially experiments in the related subjects need more realizations in 3-D platforms and formats. The necessity for continuation of the research on the development of understanding and interest in chemistry by implementation of modern teaching methods and strategies is crucial (Emilov, 2013).

Even Bloom's Taxonomy which was created by Benjamin Bloom in 1956 and revised by Anderson and Krathwohl in 2001 (Anderson & Krathwohl, 2001), used

in wide areas of education for framing digital tasks, evaluating, writing questions and assessments adapted itself with the new era of digital platforms. Different frameworks are prepared by the educators in order to make use of the digital tools during the learning, teaching and evaluating process.

Mann (2005) exemplifies in a research to what point the use of digital technologies evolved in from the recent past until the present:

> "The post and vote model is a method of collecting and analyzing peer assessment data using the variety of features provided in off-the-shelf Web tools. This model emerged in the late 1990s, at a time when colleges, universities, and training organizations had already adopted a Web-based training platform and were becoming acquainted with the features provided in the Web tools. These Web tools included: a bulletin board for posting and replying to discussions, a student viewing area, a questionnaire tool, a message compiler, online chat, student progress tracking, group project organization, student self-evaluation, grade maintenance and distribution, access control, navigation tools, auto-marked quizzes, electronic mail, automatic index generation, course calendar, student homepages, and course content searches (Mann, 1998a, 1998b, 1998c). Today colleges, universities, and training organizations around the world are using Web-based training platforms to offer students an online education. Since these tools are customarily grouped together under a course name and protected by a password, they can be treated as elements of a "system," a "Web course management system" (WCMS) (Mann, 1999a, 1999b, 2000a), consistent with systems theory, and the post and vote model is a subsystem, or more accurately a modeling subsystem of the WCMS. More discussion about the post and vote system follows."

Digital literacy and digital citizenship are the new concepts for teachers, students and parents after the pandemic and starting of teaching, learning and evaluating online. With the help of ICT and digital literacy of participants in schooling process, the education will not be alone and the investment on education will be more meaningful. Some researchers, such as in Emilov & Tafrova – Grigorova (2014) `s work, show that the classroom environments effect the attitudes of students towards the subjects taught at school. A series of research studies have indicated that a positive correlation exists between the constructivist classroom and student attitudes toward science (Fraser, 1981; Kim et al., 1999; Oh & Shin, 2005; Oh & Yager, 2004; Taylor et al., 1997). Considering the needs and interests of the students relating to technological advances, embedding digital means to the classroom environment will surely assist boosting student motivation. Moreover, according to Mann (2006), the ease of adaptability of the Internet communication tools enables pursuing the active research process. He states that these tools can accordingly be presented as an extra-curricular activity to reinforce the learning process if needed. (Mann, 1998a, 1998b, 2000). He emphasizes that including an Internet communication tool to strengthen the lesson is one of the most common methods to carry out educational research recently (Mann, 2006).

Aim

To investigate the effect, use and applications of digital platforms in education and to make a snapshot of the current situation in Bulgarian private schools.

Research questions:
1. What kind of difficulties do the teachers encounter during online education in the period of the pandemic?
2. What kind of difficulties do the students encounter during online education in the period of the pandemic?
3. Can usage of ICT and digital platforms meet the needs of educators and construct a desirable contact and communication between teachers and students?

Methodology

The participants' schools are private schools, which are situated in the center of two big cities: Sofia and Plovdiv. The total population of these cities is more than two million. The education system applied at these schools is approved by the Bulgarian Ministry of Education and Science. There are four levels of education: *Kindergarten (5 and 6 years)*, *Primary school* (1st - 4th grade), *Secondary school* (5th – 7th grade), *and High school (*8th – 12th grade).

The total number of the participants in this research are 573- From Sofia 387 students and 186 students from Plovdiv.

The participants' teachers are totally 81: from Sofia - 56 and from Plovdiv – 25.

The period of the research is 2020 - 2021 school year, which is 36 weeks or 180 days with 315 minutes education per day.

In this research as data collection methods qualitative research with observations of students` attitudes towards schooling during the online learning process, interviews with teachers and parents, the questionnaire using Google Forms and its reports and documentation are used.

Findings

The use of ICT tools from teachers

For the question: Do you have the necessary materials, tools and environment to do your work well?

Fifty teachers responded with 9 and 10 points to this question. This is because of the regular investments on education and teachers made at school. Teachers are thankful to the school administration for providing personal laptops for each teacher, receiving feedback, technical support and lectures about different digital platforms to increase their digital literacy at the beginning of the academic year.

According to the research conducted with five primary school teachers, the teachers prefer to carry out their lessons at school because of the age level of the students and their needs in the education process, which require more help face to face and in person. During 2020/21 academic year, only for five weeks the lessons were taught online for the classes up to 4th grade with the regulations of Ministry of Education and Science, which took into consideration the recommendations made by the school principals, teachers and parents. In case of students being not present at school due to Covid 19, the same teachers maintain the qualifications for

online teaching and hybrid education, all of whom use G–Suite for education. To share materials, tasks, assignments etc., they use Google Classroom and for online communication they prefer Google Meet.

"Thanks to the efforts of our qualified teachers, we see the differences between our school and the other schools" - says a parent.

For the question: Does your institution provide you with tools and opportunities for your professional development?

Sixty teachers responded to that question with 8-9-10 points. They are thankful for the teambuilding seminars and opportunities in professional development provided by the schools every year in order to update their attestation credits, necessary qualifications and methodologic requirements. Teachers teaching science, complain about the lack of experimental work during the online teaching. The contact, discovering the properties of the compounds and performing chemical reactions are the musts in chemistry lessons. "The virtual laboratories can help students to visualize the content but this is not enough" - says one of the chemistry teachers.

During the 2020/21 academic year, Bulgarian Ministry of Education and Science gave permission to principals to allow students to be in remote education form for 30 days. This allowed some of the parents in that school to write a letter to the school principal to enable their child to receive distance education. During the schooling process, less than 10% of the students preferred this way of studying. Besides, during the second semester, 1500 students in Bulgaria preferred to be online with the permission of Regional Managements of Education or school principals. In Plovdiv where the school that was surveyed is located, 40 % of the students preferred distant learning. The high percentage is due to the possibilities in hybrid education. Some school principals installed cameras, which are pointed to the boards in the classrooms. By this way, students who are at home can follow the lessons with great ease. On the other hand, most of the students that prefer online education complain that the teachers are giving too many assignments and tests when the students are at school. In order to escape from unexpected oral or written examinations, they follow the lessons online. "Although the modern technologies are used at schools, they cannot replace the regular learning process"- claim most of the school principals.

For the question: Does the provided LMS (SHKOLO / GOOGLE CLASSROOM / or other) help you accomplish your tasks at school?

Sixty-two teachers responded with 8, 9 and 10 marks to this question. This shows the high percent use of digital platforms and digital literacy among the teachers.

Some of the participant teachers from secondary and high school in this survey think that online education is better than being at school. With the digital skills the teachers acquire, they teach the lessons easily. They use Google Classroom and Google Forms. The teachers emphasize the time saving features of the Forms in testing students. Here the class can be separated into different groups. When the tests are sent to the students, they can answer the questions within a scheduled period and submit the forms. Then the teachers can see the results in a minute, analyze them and return the results to the pupils.

According to the Bulgarian and English teachers, who prepared the students for the Matura exams (high school finishing exams), with the help of digital platforms

and digital literacy of students, the university exam results were higher than expected for 2020 academic year, considering the probable expectation that the education process interrupted by the pandemic would reflect negatively on their exam results. The teachers state that tendency of twelve graders not to visit classes during the last months at their school life has changed positively with the online education. "They were on time in my classes. They regularly did their assignments. All of these were reflected on their exam results and a significant jump has been observed in the results at the preparation exams for the subject *English*" - says one of the English teachers. These factors prove that although the students faced an unexpected situation due to the pandemic in their education process, thanks to the contribution of the digital platforms, they were able to adapt to the new situation continuing their preparation, which resulted in good scores. As claimed in the previous research, "….with the result of high validity of student assessment, and democratization of the assessment process" (Mann, 2005) have proven the high validity of such tools, the current research gives positive impact of LMS as well.

All of the teachers think that an important feature of the digital platforms is to be able to write the absences, the topics and the grades online. The paper work is decreasing and simultaneous controls from the parents is increasing with the use of e-registry system.

LMS systems have been developed during the pandemic. "We were one of the first schools that started to use an online registry system for school administration in order to help our teachers in school documentation – writing absences, marks, topics, analysis, etc. four years ago" - says the deputy head of the school. "During the online education for the past year, there were notable enhancements in the digital platforms. We had been using G-Suite for Education for more than two years, but after the pandemic we found it to be of great assistance for our school" - he adds.

The timetable was made flexible during the process. When the government requires a lockdown, we start remote education and the duration of the lessons is transformed from 30 minutes to 40 minutes.

Results

What kind of difficulties do the teachers encounter during online education in the period of the pandemic?

When the parents are not available, this makes the online process a crisis for younger students as they are more in need of a supervisor by them in comparison to the higher class students to monitor and assist them. The second, third and fourth graders can study by themselves but parental control should be accompanied now that the teacher does not have the opportunity to have the control on the students as much as it is in the classroom environment.

- What kind of difficulties do the students encounter during online education in the period of the pandemic?

Students from secondary and high school being older than 12 years old and being able to stay alone at home when their parents are at work make them spend more time online in comparison to younger students in their education process,

however, some students might lack motivation and self-control which leads to not being able to use their time in front of the screen more effectively and direct their interests in other activities unrelated to the education sphere e.g. online games, using the Internet, etc.

Can usage of ICT and digital platforms meet the needs of educators and construct a desirable contact and communication between teachers and students?

- Installing cameras which are pointed to the boards in the classrooms, using effective LMSs, digital platforms can meet the needs of educators and construct a desirable contact and communication between teachers and students in online, offline, hybrid ways of teaching.

Discussion

As Mann (2005) argues, "it appears that familiar models and theories of instructional design are now being augmented by research in cognitive load theory (Paas, Renkl, & Sweller, 2003) and multimedia learning (Mayer, 2003; Mayer & Moreno, 2003). It seems that in general educators are becoming more socialized to the new tools and strategies of the trade. It appears too that we may soon count on better Web tool assistance from platform developers." He then concludes: "In any case, it seems likely that student assessment of Web-based learning will always be a busy time for instructors." (Mann, 2005)

The current investigation took a successful picture of the education in private schools. The results from this survey are in correspondence with other research made with teachers and students in different secondary and high schools in Bulgaria such as Center for Creative Training using the software ChromEx created in Switzerland.[1]

From the observations made in this research, the teachers and students tend to use LMS in sharing materials, scheduling, presentation, assignments, etc. With the subprograms provided here, the teachers can find helpful applications in preparation of quizzes, tests, questionnaires, exams and evaluation techniques. The time saving feature in those digital platforms is that they automatically evaluate the results, make analysis of the results, send them to the students and show the points of the test. Online conferencing or meeting is another aspect of the digital constructivist learning environment. Thanks to the improvements of ICT in digital learning, some of the modern and up-to-date LMS provide video conferencing tools, configured in the platform, and with one click, the teacher is in connection with the students.

Regarding the requirements of the new process, only a few teachers think that online education is not an effective way of teaching. The reason is that the students do not open their cameras, play games during the lesson, eat whenever they want and even travel to where they wish. The concentration, motivation and focusing are missing among most of them. However, considering pros and cons of application digital tools and platforms, their contributions to the field of education overweigh their downsides.

Overall, this study proves that competency in digital literacy of both educators and learners makes great contributions to educational process and the findings and the results of the current research are consistent with the previous studies. With

the increase of the awareness of digital literacy and the variety of digital tools and platforms, the concept of digital citizenship proves to be one of the fundamental bases of the future of a well-educated society.

Notes

https://www.marica.bg/plovdiv/obrazovanie/digitalnoto-izpitvane-presicha-prepisva-neto

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Abstract

A survey has been conducted with teachers and students in two private schools in Bulgaria to observe the digital literacy used in education recently. The aim of the study is to detect the digital skills of the participants and to take a snapshot of the atmosphere of online educational process. In teaching and learning process, the nature of learning environment is important. According to Piaget and Vygotsky, the social interaction has a key role in formation of cognitive development of students. Providing constructivist learning environment at schools will help learners to increase their attitudes towards the taught subjects. ICT has an important role in building such an atmosphere where students can develop their digital skills in using different strategies such as inquiry-based learning, problem-based learning, discovery learning, etc. Today there are plenty of digital platforms that are used in teaching, learning and evaluation processes. In one year, after the pandemic, schools started to use different Learning Management Systems. Our lives have changed spontaneously with the new style of learning and teaching models. Although those platforms existed before the pandemic, their usage was at a very low level. The schools, teachers and educators with up-to-date qualifications, did not have any turbulences in adapting their skills in new situations, which are in the base of constructivist approach.

Keywords: ICT in education, digital literacy, digital platforms, constructivism, LMS, online learning

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