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Covid-19 and Digital Transformation in Greek Secondary Educational System

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Abstract: Due to the recent pandemic, classroom learning has been transformed to distant learning. The need for digital transformation emerged immediately in the Greek primary and secondary educational system and certainly produced a change in the way of learning provided due to the integration of additional digital techniques and upgraded digital means in the Greek educational process.

It would be short-sighted to say that this change, however, simply refers to the use of technology, and to ignore the fact that also requires the creation of quality educational content, which highlights the need to strengthen the skills of educational staff in order to be able to make more efficient use of information and communication technologies. The position of teachers needs to be strengthened to adopt effective methods of ensuring the expected learning benefit.

A reliable e-learning ecosystem requires high quality content, user-friendly tools, value-added services and secure platforms that preserve privacy and ethical standards.

Key words: digital transformation, quality digital content, educational digital resources, and tools, user safety, user friendly applications, ethics

1. Introduction

The recent crisis — closure due to the pandemic — forced educational structures to implement rapid changes in a short period of time that would take months or years otherwise. The digital transformation has been accelerated at least five years ahead due to the pandemic and has been the one and only way to transform the educational process. Within a few months, digital alms of years were made.

Due to the recent pandemic, classroom learning has largely become a distance only learning process. Within a few weeks teaching in physical classroom conditions became virtual learning process.

The classroom session turned into a Video Conference — after all, there was no time for something more — without the necessary didactic planning for the distance learning (Unesco, 2020).

However, e-learning is not only the formation of the digital classroom through teleconferencing nor the only stage of the digital transformation that occurred in the educational process in the Greek system of basic formal education.

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2. Initial Approach

The first step towards digital transition was the chance for the e-registration of students without the physical presence of parents/guardians at school to their electronic registration through the option User Register of the Greek School Network and Networking Technologies Directorate (GSN-NTS) known as "register.sch.gr" platform (Registrations, 2020).

Digital Transformation in primary and secondary education in Greece initially, in November 2020, took the form of Teleconferencing with the help of platforms such as meeting.sch.gr, zoom, skype and finally after a short time the webex platform was the official proposal of the Ministry of Education (Webex, 2020). This was the second stage.

As possible uses of all the above teleconferencing systems and in particular of the official webex meetings teleconferencing platform were proposed:

1) video conference for presentation, cooperation and exchange of views on a specific topic.

2) introduction and presentation of a topic.

3) distance learning-virtual classroom, where the teacher or lecturer can conduct his/her course addressed at students who are in various remote geographic locations, and who participate in the course through their computer. The trainees are transferred to the virtual classroom environment using their access codes credentials, without the need to physical remove from their house for their participation.

This was the communication channel between the teacher and the students for the formation of the digital classroom in the unexpected state of confinement caused by the pandemic due to Covid19.

The term E-learning implies information packages and teaching materials for educational purposes provided in electronic form either online or offline (Stefanie Gerlach, 2015).

In order to be further supported the asynchronous distance learning process, it was used complementary two LMS platforms (E-class already was in use) (Eclass 2020) and the newly built e-me platform (E-me, 2020).

In this third stage of the digital educational transformation, after the best organization and full use of the LMS platforms for the asynchronous education, aroused the need to upgrade the teaching material in terms of quality in order to enhance the learning process.

3. Quality of Educational Material

Digital transformation certainly brought a change in the way of teaching due to the integration of additional digital techniques in the educational process. This change, however, does not simply refer to the use of technology through teaching digital means, but also requires the redesign of educational content of high quality. The new educational digital resources that are required highlight the need to amplify the skills of educational staff so as to become most efficient in the use of information and communication technologies.

The first stage for this strengthening of the educational staff is the digital literacy. Digital literacy is defined as the ability to understand and use information that comes from different sources on the computer, in multiple ways and in a variety of environments (Bull, 1997).

Digital literacy contributes to the digital evolution of the individual, a development that allows him to manage information, create new ideas from information and use technology to achieve strategic goals (Daan Farjon, 2019).

Shulman was the first to investigate and substantiate the structure of a general theoretical framework of

effective and quality teaching practice widely accepted. Shulman defined three components as crucial for enhancing the quality of teaching: a) Knowledge of the Cognitive Object and alignment with the Curriculum (Content Knowledge), b) Knowledge of Pedagogy, meaning the general methodology followed by the tutor in order to create strong educational conditions for learning (PK: Pedagogical Knowledge) and c) Knowledge of Pedagogical — Teaching Framework and Learning Object (PCK: Pedagogical Content Knowledge) (Shulman, 1986).

The preceptive transformation is therefore a head of all, that is, in order to transmit the scientific knowledge during the teaching, the prior knowledge, the interests and the attitudes of the students must be taken into serious account in order to have the full understanding and to achieve the maximum comprehension of the taught material.

With the development of technology and the expansion of the internet and the wide availability of computer media, the integration of technology in the educational process has led to the expansion of the Shulman model of Pedagogical Content Knowledge (PKC) to the TPACK (Technological Pedagogical Content Knowledge) model that includes Knowledge of Technology (Koehler, Mishra et al., 2007). The Technological pedagogical content knowledge (TPACK) framework describes the kinds of knowledge required by teachers for the successful integration of technology in teaching (Wikipedia, 2021). It suggests that teachers need to know about the intersections of technology, pedagogy, and content.

Both Eclass and E-me are the official Greek LMS environments for primary and secondary education that include in their design all the main axes of the TPACK-Technological Pedagogical Content Knowledge model.

4. Characteristics of the Greek LMS for Primary and Secondary Education

The tools available on both LMS, Eclass (eclass.sch.gr) and E-me (e-me.edu.gr), enable and formulate a teaching framework that actively engages educators in the process of designing digital educational content within the purpose of achieving scaled up digital literacy and skills that incorporate digitalized means.

In fact, one could argue that their structure is based on specific areas (areas of effectiveness) and provide evaluation criteria (factors of effectiveness) adapted to the educational needs and with certainty are empowered to meet the differentiated goals and training methodology imposed by the pandemic.

The TPACK methodology considers that the Knowledge of Technological Tools is equal to the Knowledge for the Cognitive Subject and the knowledge of the Teaching Methods.

In Eclass Greek LMS, important tools spontaneously allow the application of mixed learning and promote the collaborative approach, student assessment, feedback and contemplation.

The use of this LMS system discreetly cultivates basic skills in those who use it and all its tools, from the simplest to the most specialized, are weapons in the quiver of the teacher to achieve the learning objectives and cause the unpretentious organic inclusion of digital media in teaching process.

In addition the tools of the Eclass LMS for asynchronous teaching and the educational material designed in it are compatible with the second authorised by the Greek Ministry of Education, most recent designed, E-me LMS and vice versa, in order to ensure the dual demand of compatibility and dissemination.

Through the inevitable use of these 2 LMS during the pandemic, the process of sequence design and the alternation of the use of tools, the teacher gradually acquires the complete knowledge of using the discrete tools of the for his effective teaching, the ability to choose the appropriate topic each time, to integrate appropriate activities from the cognitive object to exploit the advantages of Technology.

Clearly the way of teaching and learning has changed radically due to the Pandemic, however most of the

teachers proved that they overcame the initial fear of technology and understood the need to transform their material in order to achieve the teaching goals.

5. Analysis of the Possibilities and Extensions of the Greek LMS Eclass and E-me

The proposed platforms of the Panhellenic school network, both Eclass and E-me have tools that support the TPACK framework and the inevitable use by Greek teachers allows them to gain a deep understanding of how teaching of a particular context informally may become more authentic and effective as a result of the inclusion of appropriate digital technologies.

Encouraging the expansion of the use of these two LMS platforms (through programs for teachers' professional development by the existing Greek Regional Educational Planning Centers) will allow the professional development of teachers and the full integration of digitalization.

So one could use the term digital maturity, because there are neither magic lamps nor maginary supernormal plasma (genie) to complete something. Instead, there is the sequential, gradual and methodical approach to complete the requested task (Kane, 2017).

In the two forementioned platforms (MLS) of the Greek Ministry of Education are included digital technologies-tools that can support effective teaching and learning processes.

In addition, these digital tools consist key parameters, already considerated in the design of both LMS systems and have become factors for an holistic improvement of the quality of digitally transformed educational content.

In detail, they are categorized as below based on the tool (educational digital resource: EDR) they contain:

1) Audiovisual Technologies

• Students watch a series of videos - Multimedia tool, Blog tool, Wall tool

• Students work on a digital simulation - computer science, math, physics

• Students compose a video in groups

• Students create a concept board — Concept Map Tool

2) Digital text-based technologies

• Students create a wiki

• Students create a blog

• Students create an e-portfolio

A serious factor to be considered during the stages of upgrading the digital profile of primary and secondary school teachers is the ability of the teachers to assess the gained knowledge of the students in order to complete the evolution cycle.

And these tools are integrated in both LMSs (Eclass and E-me) through the following technologies:

1) Evaluation Tools

• Students answer online tests related to learning content — Exercises Tool

• Students work on a flexible and dynamic teaching plan — Messaging Tools, Exercises Tool

• Students participate in real-time voting-Questionnaire Tool — Chat tool

• Students complete repetition procedures and consolidation questions by getting feedback on their performance — Learning Lines Tool.

In summary, the serving teachers of the Greece in both primary and secondary education have at their disposal technological - digital tools already developed and integrated in LMS of high quality standards that allow them to

complete their teaching tasks with complete success.

Last but not least, these tools enable them to carry out holistic teaching approaches following all the necessary steps:

1) Activation of students' prior knowledge at the beginning of a lesson;

2) Adaptation of learning activities to students;

3) Formative evaluation of the performance level of each student;

4) Immediate guidance of students either directing to the plenary or focusing in specific individuals;

6) Support of collaborative learning through task assignments in teams;

7) Supervise class discussion about a task.

6. Impact Study Context

All that remains for us teachers to consider is all the possible ways through which our effort will be facilitated at first and our contribution to the new digital context of education that has emerged due to COVID19.

In order to be objectively evaluated the technological knowledge of teachers, multiple tools have been proposed. One example of an evaluation tool of this kind is TILT (Test of Technological and Information Literacy) as (Senkbeil, Ihme et al., 2013). Its structure is one-dimensional and includes 29 multiple choice questions.

TILT measures basic key skills in the use of ICT Technologies (network technologies, communication technologies, data processing technologies) and is also used for competency assessment in Germany in national range. It is considered as a reliable tool for measuring the Technological Knowledge of teachers.

In European level the most recent online teacher self-assessment tool for teachers is the SELFIE tool for teachers, based on the European framework for teachers' digital competence. Its basic purpose is to facilitate the identification of strengths and weaknesses in digital, technical and didactic skills of teachers.

It has been used by more than 670,000 teachers, students and school leaders to evaluate how technologies are being used in their schools and in order to design improvements. SELFIE (Self-reflection on Effective Learning by Fostering the use of Innovative Educational technologies — Self-assessment for effective learning by enhancing the use of innovative educational technologies) can be used by any primary and secondary school or school anywhere in the world and is available in 32 language versions (Commission, 2020).

7. Conclusions

In conclusion, the technological Pedagogical Knowledge of teachers can be defined as a prerequisite for the effective application of both conventional and innovative digital educational technologies in the classroom, able to enhance the learning outcomes and prepare students with digitally assisted technologies.

The recent period of interruption of conventional classroom process and the closure of all physical facilities has highlighted the need both for students and their tutors to be able to use digital means so as to continue with distance learning.

Structured in an efficient way digital educational content and professional training in digital skills — including digital teaching methods — will be essential for Greek teachers, and for teachers worldwide. They will benefit from greater support for online, lifelong or mixed learning, depending on the conditions and needs of the student.

In the context of the development of digital educational content, reaching the highest pedagogical and educational quality standards should be the aim.

In conclusion, the digital transformation in education is a reality, digital maturity is the key. For this reason, the process should be standardised in very specific stages such as the excellent knowledge of the existing platforms by teachers, the full use of all their tools before, during and after teaching and finally the interconnection of already available repositories with excellent but fragmented content, so that a classified access will be a common practice firstly to the teachers and in a second phase for the students.

The position of teachers needs to be strengthened to adopt effective methods of ensuring the expected learning benefit. A reliable e-learning ecosystem requires high quality content, user-friendly tools, value-added services and secure platforms that preserve privacy and ethical standards.

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