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Multilingual Conversational Communication Tools for Distance Learning

Synchronous & Asynchronous Teaching During the Covid-19 Pandemic

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Abstract: *This paper provides a brief summary of the Aristotle University of Thessaloniki (AUTh) policies for providing solutions and supporting the tertiary education community with good practices and an online catalogue of tools for learning during the Covid-19 crisis. Electronic learning takes place mostly in Greek, but during the Covid-19 pandemic, progressing rather explosively, many resources where made available predominantly in English and other EU languages. In recent years, the AUTh has been expanding its innovation in the fields of e Learning and Distance Learning. The Information Technology Center (ITC) and especially the Academic Activities and Technological Support Office (AATSO) provide integral solutions in the above-mentioned areas. These capabilities are perpetually upgraded and improved, transforming remote education into a more authentic process and providing user learning experience anywhere-anytime. AATSO develops, adopts and manages rich on-premises environments, along with tools and collaboration platforms, either open source or commercial. This gear offers enormous potential for collaboration with synchronous and asynchronous data transmission, strong interactivity through learning flexibility, prodigious new features and options.*

Keywords: *Distance Education; e-Learning; ITC; Web Conferences*

1. INTRODUCTION

The Covid-19 pandemic in a matter of weeks has changed how instructors teach and how students are educated in all education systems around the world. In Greece, after a relevant joint ministerial decision of the Ministries of Health and Education and Religious Affairs[1], it was decided to temporarily ban the educational operation of all educational structures in the country for the period from 11/3/2020 to 24/3/2020 with a margin of extension. This practice had been afterwards extended up to the spring semester end.

This was the first drastic measure to be taken, on the one hand, by taking precautionary measures to raise the bar in the spread of coronavirus, and, on the other hand, to make public health a priority. However, this legal provision does not concern a total prohibition of educational functions but of teaching that takes place in physical presence of the involved class members. Therefore, the aim of Universities is to offer as much Distance Education and work as possible by electronic means remotely, in order not to fail the spring semester; these courses have been *de facto* considered equivalent to the face-to-face ones and will be counted in the provided by legislation teaching weeks length.

Regarding the "Implementation of Distance Education in Higher Education institutions" decree[1], the Ministry of Education and Religious Affairs directs that the conduct of courses is not limited to the asynchronous way of posting teaching material on an electronic platform, but should also be accompanied either way by the provision of synchronous teaching (online courses) and live interactive video lectures or a combination of the last two methods. Therefore, Distance Education, in addition to the appropriate tools needed, depends on elaborating special skills in the administrative and organizational structures of the educational systems involved.

As a productive unit of the Aristotle University of Thessaloniki (AUTh), the Academic Activities and Technological Support Office **(**AATSO) was summoned to allocate the necessary educational resources as well as to sought after the pressing requirements for the Distance Learning of courses, with the appropriate technological support and the

[1] Decree No. D1a / GP.Oik. 16838/2020 (ΦΕΚ Β '783 / 10-03-2020)

guidance of the teaching staff in any complication that would become apparent.

The AATSO is thus engaged in a wide range of issues in the field of Multimedia Learning, e-Learning and Distance Education. It also supports members of the University's community and trains educators along with students in the use of interactive videoconferencing services and live-streaming systems [1].

With these reference services in perspective, lecturing would be enhanced with innovative tools, introducing novel good practices in the established teaching models, having as ultimate goal to stimulate students' interest by increasing their motivation to learn and improve their performance during tribulation.

1.1. Distance Learning

Distance Learning is defined as an organized form of education where there is separation between teacher and learners and where electronic communication means are used to bridge the "natural" gap that exists. The methods and techniques of its implementation considerably vary depending on the period and the level of technology in perspective.

The "Internet-based Distance Learning" model is part of the new and modern way of life that emphasizes the extensive use of the Internet not only for Education, but also for a variable width of social and consumer practices. Through the use of Information and Communication Technologies (ITC) and the Internet, the conceptual deconstruction of space and time is achieved, resulting in the immediate transfer of information and educational material [2]. In particular, Distance Learning has two sides, the physical and the temporal, which relate to the segregation between:

I) Teacher – trainee

II) Training with each other

III) Teaching and learning processes [3].

As Lionarakis has pointed out since 2001, Distance Education is based on three important axes, the trainer, the trainee and the educational material in contrast to the binary relationship between trainer and trainee that characterizes conventional education. The pedagogical characteristics of Distance Learning do not simply instruct students how to learn on their own but also how to function autonomously in an exploratory course for knowledge acquisition [4].

Based on the above principles, the trainee takes responsibility for his studies and acquires a more accountable role, while at the same time the teacher is called to take on the role of counselor and mediator, with the responsibility to motivate the trainees and organize the training programs ensuring maximum efficiency in the learning process [5].

Indeed, during this survey it was noticed that classes with large audiences recorded more consistent and frequent attendance, as limiting conditions connected with student mobility, availability and amphitheater capacity were annihilated.

1.2. Information and Communication Technologies (ICTs)

Technological tools are *en masse* used in education because they help and support learning, while providing students with opportunities to gain faster new knowledge and learning experiences. In order to be able to properly support educational activities, the deployed technological tools should incorporate various teaching strategies, allowing the student to explore and interact, and be as interdisciplinary as possible.

ICTs are defined as the forms of technology used for the purpose of transporting, processing, storing, creating, presenting, sharing or exchanging information through electronic media [9]. More specifically, the ICTs agenda refers to the use of computers for delivering individual functions through software, usually with the extensive use of Internet or similar resources. Also, the conceptual merit of this agenda is directly related with how successfully machinery, software and equipment are incorporated into the educational process.

ICTs essentially correspond to a subset of media such as New Media, Telecommunications and mainly Multimedia. They may include media with data in the form of text, image and sound combining in parallel synchronous and asynchronous communication and information technologies such as video conferencing, forums, e-mail, blogs, computer software, radio, television, video, telephone satellite systems, portable and mobile gear, and many other devices that allow the interconnection and transmission of any amount of data in a very short time [6].

1.3. Synchronous and Asynchronous learning

Distance synchronous and asynchronous Learning should involve integrated teaching strategies.

Synchronous teaching, re-teaching and learning use communication technologies that require the direct connection and in real time transfer data. Users have the ability to interact with each other during scheduled educational activities. It is usually done after planning the organized delivery of course lectures, focusing on learning through interaction and several times through collaboration. In this way, the teaching and dissemination of knowledge is facilitated and the necessary interaction for learning is supported. Usually in synchronous learning, teleconferencing platforms are operated, either commercial or open source. In the following sections some such tools used by AUTh will be analyzed [2].

Asynchronous is the teaching during which the student cooperates with the teacher at a different time from the delivery process of the course. That means that the creation of the instruction material was created by the teaching staff in previous time and the access to the learning material from students is scheduled through the Internet on specific platforms that are provided [7]. numbers.

2. MULTILINGUAL E-LEARNING IN THE AUTh

Since the beginning of the Covid-19 lockdown, in these extraordinary conditions, the appropriate measures were carried out immediately with the adjustment of administrative services to operating remotely, as possible, and the prompt acclimatization to e-Learning schemes from all the 45 AUTh departments. Educators and students were pushed to ardently work and study from their homes in asynchronous and synchronous electronic platforms. They would have access to information and content that is deployed in multimedia format and may amply interact by teleconferencing in virtual environments. Likewise, students could communicate with teachers and with other students or study on their own in certain platforms, at any place and time.

The technological challenges faced by the ATSSO in Distance Learning were many. Indicatively the most important ones will be pointed out.

One problem was the lack of significant technological skills on the part of both teachers and students. At the same time, many students and teachers could not create or attend the course as they faced network overload issues, especially those with very low bandwidth connections; some faced technical problems with their computers or even crackdowns. To tackle this problem and make it easier for professors and students, AUTh provided them with appropriate e-Learning platforms to refer to, through which the sessions would be recorded and then made available on demand.

Another problem was the copyright issue for the material used by the teaching staff (images and electronic files from books and the Internet) during the on-line lesson and particularly, what material would eventually meet the standards to be uploaded or not.

As libraries where not otherwise available, nor books could be easily delivered to students dispersed all the way throughout Greece and Cyprus, serving the needs for literally published compositions or otherwise intended learning resources, a wide range of electronic records, enriched with scholarly Academic works available over the Internet and video lessons was made available to the students.

In technical subjects it was prevalent to use widespread resources, like TED lectures, animations, or ordinary qualitative electronic learning assets that promoted greater understanding by enhancing neurocognitive appreciation over external sense impressions (Fig. 1).

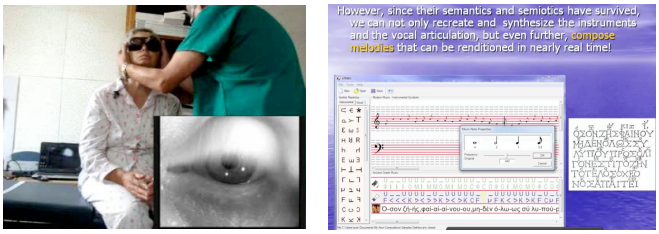

Figure 1. *Electronic resources in English, left, for clinical diagnoses (Dix-Hallpike test) in ENT Medicine, right, for Computer Music.*

Indeed, multimedia learning has endorsed an intensely enthusiastic two-way interaction between learners and the teaching staff, the path of success during the very difficult, in economic and psycho-sociological terms lockdown.

The success of the broadcasting series of learning resources has created euphoria for a transition to more energetic trajectories, in tertiary education instruction, for mass media like productions.

New channels of communication seem to be opening to road ahead to enhanced remote communication between the involved parties. Since such a transformation needs considerable investments in equipment and communications, a temporary option was to designate the on-line course as a closed circuit one, addressed only by authorized students, which could not download the audiovisual material. Class registries and identification codes for access were set, restricting viewing to the pool of registered users for each course.

Nevertheless, this can in no way be a long term solution, since the Greek legislative corpus designates (for the provisions on the protection of intellectual property and related rights) that the material used and uploaded to the University platforms, and consequently on the Internet, should be either property of the instructing team or have the relevant permission from the producers of multimedia content accompanied by the appropriate referral texts.

2.1. Essential Online Tools for asynchronous teaching

For Distance Education, the IT center provided the educational community with alternative schemes for both synchronous and asynchronous teaching. The basic platforms for distance communication with students and for the organization of the educational process (educational material, quizzes, exercises, etc.) were the asynchronous Learning Management Systems (LMS) – Moodle and eClass.

The mission statement of these platforms is to enhance teaching through electronic planning. Moodle and e-Class are collaborative learning management platforms, which are based on free admission, i.e. are provided free of charge. In particular, these two platforms provide access to a personal website-like structure, where students can store their scholarly accomplishments; the same time, instructors access their teaching Learning Objects, instructional material and a variety of tools that support the planning and exchange of information (Figs. 2, 3).

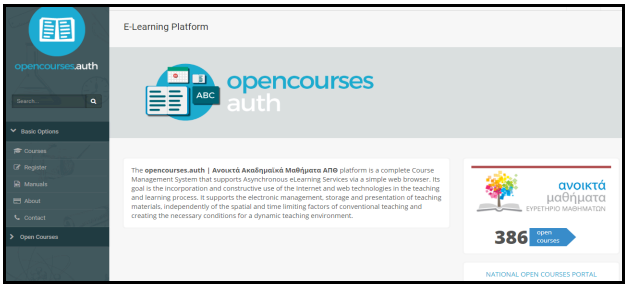

Figure 2. *Learning Management System - eClass*

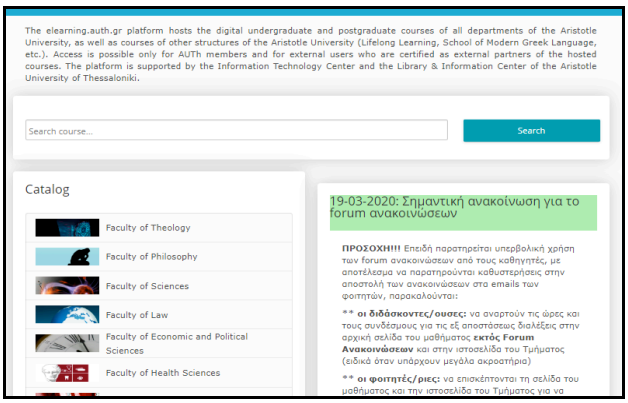

Figure 3. *Learning Management System - Moodle*

The key tool elements of these LMSs are:

- *Information exchange* with various tools such as announcement tables, electronic files, ready-made Learning Objects, multimedia files, agendas with datebooks, schedules and deadlines.
- *Collaboration and communication spaces* such as forums, chats, wikis, emails, blogs, and web conference apps.
- *Feedback space* handling questions, answers, directions, research papers.
- *Evaluations*, either formative or final, linked with assignment submissions and quizzes.

Another AUTh on premise LMS institutional platform is Open Delos, where teachers can record and broadcast the lesson remotely via live streaming or as processed video lessons (Fig. 3).

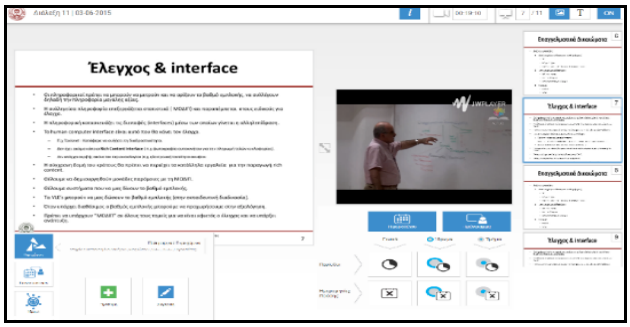

Figure 3. *Teaching Experience with video conferencing tool Open Delos.*

Some 25% of the teaching material on Open Delos is in English, an asset for providing instruction to some 1,000 Erasmus students in AUTh per annum.

In periods of high demand, they may edit the video of the course online and make it available directly on the Internet for their students. Recording and live streaming can be done either from static IP cameras installed in 55 amphitheaters of the University campus or through each users' personal computers and recording paraphernalia.

The management and regulation of this process is done by the lecturers themselves without the need for any additional external technical support. The platform also provides modern features, such as the ability to sync videos with presentation files (Fig. 3). At the same time, it is important that the learning facility does not allow students to download the video sessions and use it in any other way, thus ensuring the copyright of the author. Finally, it uses an "HTML5 video playback" module that runs on almost any operating system, browser or multimedia player.

3. THE NEWCOMERS: ESSENTIAL ONLINE TOOLS FOR SYNCHRONOUS TEACHING

The basic interactive online tools for asynchronous teaching at AUTh are its teleconferencing systems. The main advantage of web conferencing is that it eliminates potential geographical constraints and increases learning opportunities, as it is possible to conduct educational online meetings with a large number of participants, without the need for a class or assembly to flock at a particular point.

The main disadvantages of videoconferencing practices of this kind are related to the use of specialized equipment. Each user should be provided with the necessary equipment such as a headset, quality camera and a high-speed network connection. In addition, the total number of participants depends on the available Internet resources and the computing power of the videoconferencing server. Trainees should also have basic skills in the use of ICT techs and

gadgets. Specifically, ITC provides AUTh lecturers a set of Distance Learning Scenarios that best suit each lesson according to the number of students attending the course.

I. For small audiences up to 100 people, IT supports the on-premise Big Blue Button (BBB) service.

II. For medium audiences, from 100 to 250 people, ITC provides licensed Skype for Business, Google Meet and Microsoft Teams clients.

III. For large audiences ranging from 250 to 500 people, ITC provides the Zoom & WebEx platforms with the corresponding number of user licenses.

The reason behind ITC providing a bunch of alternative platforms for modern telecommunications was the high load and high demand for the use of teleconferencing systems worldwide this period. This stipulation posed the risk of overloading datacenters and consequently collapsing the teleconference systems or preventing them from operating as prescribed at scheduled times. For the effective support of each scenario, the IT center recommended the use of appropriate web conference tools and provided instructions for their use, offering the same time more than one alternate solutions. Indicatively, basic collaboration platforms will be presented; they were used quite successfully in most cases.

3.1. Big Blue Button (on premise) up to 100 users in a session

As of 16/12/2019, the IT center has adopted the new upgraded BigBlueButton 2.2 teleconferencing platform, which is supported through the ITC web conferencing service. The BBB is a reliable, open source web-conferencing system, specifically focused on Distance Learning. It allows remote users to enjoy high quality online services similar to or better than several commercial packages. BBB is being developed dynamically through collaboration with large communities of volunteer developers interested in promoting BBB as an open source gateway. The BBB project plans to eliminate Flash permanently by the end of 2020 so that pure HTML5 may be used instead. BBB has developed an HTML-Client videoconferencing program to work on desktop, portable and the very trendy recently mobile devices, thus providing users with high-quality online learning experiences regardless of their device (Fig. 4).

So far, the BBB comes in two versions, 1 and 2. The latest stable version used was BigBlueButton 2.2. It is based on HTML5 clients that eliminate problems with browsers that no longer support flash player, screen sharing, and portability, regardless of their size and functionality. The BBB program is written in ActionScript and the server components are written in combination with Java, Grails, and Scala. Many developers have devoted their time and experience to developing it, and the source code is hosted on GitHub so that everyone can contribute, by written agreement, to the code. In addition, an API has been developed that enables the BBB to integrate and collaborate with various open source and Learning Management System platforms, such as Moodle, Sakai, WordPress, Joomla, Drupal, etc. [10].

The user interface is consistent and consequent, allowing its users to understand effortlessly how all functions work. As seen in Fig. 5, GreenLight is the preferred BBB front-end web-based interface. It provides users with virtual rooms for videoconferencing, the ability to record videoconferencing in custom pedagogical scenarios with high security.

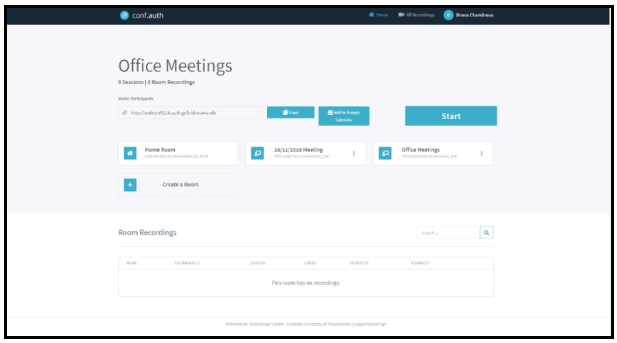

Figure 4. *BBB Interface*

Maximizing the interaction between students and teachers in different communication rooms, which can support synchronous and asynchronous communication and facilitate collaboration and knowledge acquisition, are some of its "value added" characteristics.

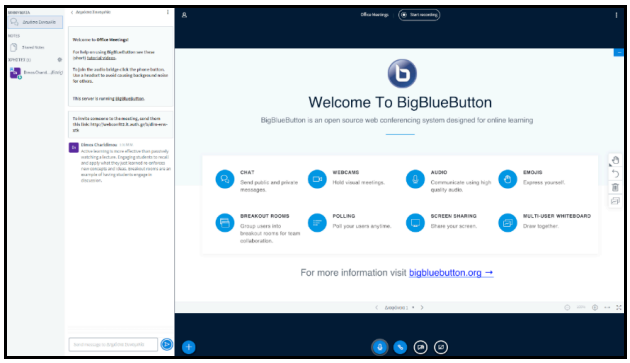

Figure 5. *BBB front-end*

The new BBB also provides enough functionality and features for users to have positive user experiences. In particular, BBB release 2.2 has the following amenities to successfully support collaborative activities:

- Two-way audio and video conferencing, up to 100 participants

- Participation in public / private conversation mode between users
- Ability to present PowerPoint slides
- Application / desktop sharing
- Interactive whiteboard
- Shared notes, capabilities for downloading slides and presentations
- Hand raising function including emoticons (expressing emotions)
- Group chat via text messaging
- Instructor control and management (setting up permissions to users for presentation and sharing, conversation restriction, etc.)
- Responsive and mobile friendly clients
- Easy navigation and accessibility (for people with disabilities).

The disadvantages of using BBB are:

- The small number of users per conference call
- Does not by itself provide Participation Meters and Statistics

In addition, the new BigBlueButton interface has been successfully integrated and is fully functional on the AUTh e-learning platform. BBB in Moodle gives these additional possibilities, so instructors may:

- Incorporate virtual lessons and provide on-line education to their students
- Provide access only to the enrolled students of the virtual class
- Create multi-activity links for online seminars in any course
- Exclude students from entering the virtual room until a moderator monitors the on-line session
- Start BigBlueButton in a separate window
- Create a customized welcome messages that appears at the top of the chat window when users enter a session
- Determine the open / closed connection dates for the session, which appear in the Moodle calendar
- Record access and manage lectures

3.2. Big Blue Button (on premise) up to 100 users in a session

As Zoom facilitates scheduling and participating in high definition (Full HD, 1080p/30fps) video conferences, subject to the users' connection and equipment capabilities. Supported devices and operating systems include iPhone/iPad, Android, Blackberry, MS Windows, Mac OS and various Linux distributions, as well as dedicated video conference terminals (H.323). Each video conference may have a maximum duration of 12 hours and can host up to 500 participants. Participants can share their screens or specific program windows, as well as interact with a whiteboard.

Advantages and disadvantages: AUTh has many times used the Zoom service for official board meetings with 300 users in a single video conferencing room and found it to be generally adequate, reliable and easy to use. It is, however, limited in features useful for classroom video conference scenarios, such as instructor control/management, lesson material sharing, participation meters/statistics and real-time tests/grading. Recently, some security vulnerabilities have been identified, as it transcended the practice of uninvited users intruding into the teleconference room.

3.3. Cisco WebEx – on cloud & commercial up to 1000 users in a session

Cisco Webex Meetings Server is a virtualized, software-based solution that runs on Cisco unified computing system servers and VMware. It uses virtual appliance technology for rapid turn-up of services to end-users. CISCO Webex provides users with the ability to streamline asynchronous video and/or audio communication, as well as display slide presentations to all participants. It offers chatting, collaboration, interactivity, PC screen sharing, presentations, videos, web browsing and more (Fig. 6).

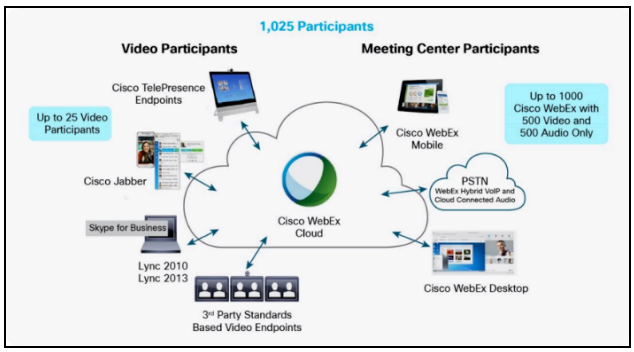

Figure 6. *WebEx Cloud [8]*

At the same time, it offers written communication capabilities for either public or personal conversation. The virtual room of the CISCO WebEx is defined in any case via the web in the "cloud".

The advantages one may endure with the WebEx solutions platform are:

- Audio/Video/Sharing
- Up to 1000 participants
- Windows, Mac, and Linux compatibility
- SIP/H323/S4B (Skype for Business) browser
- Reporting analytics
- High-quality integrated services

- Good online training and user guides
- Ease of use
- The meeting host can record the session at any time
- Rich feature set like scheduling, pairing with clients, voice assistants and many more are offered via cloud.

The disadvantages of using WebEx are:

- Recording files are larger
- Mobile access to WebEx meetings is unavailable

4. INTERNET TRAFFIC DUE TO "STAYING HOME"

All the above services tools and scripts to work must use the Internet. Yet, AUTh has faced unprecedented situations and conditions, resulting in nothing working the same as before. Internet speeds have already been greatly reduced as user requirements and needs are constantly increasing. This is also evident from the data through the country's licensed national infrastructure and in particular Greek Internet Exchange (GR-IX), and it shows how much the Greek Internet traffic has increased due to "staying home" (Fig. 7).

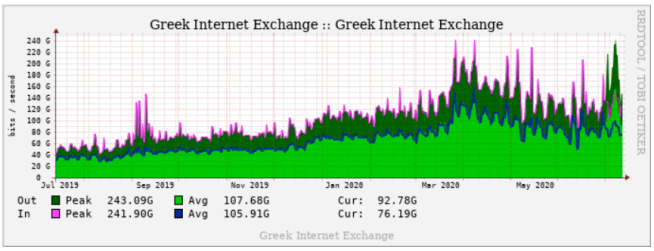

Figure 7. *Internet traffic for 2109-2020 in Greece (https://mon.grnet.gr)*

This considerable increase seems to be the most restricting factor, in quantitative terms, for the sufficient exploitation of digital schooling during the crucial examination period of June 2020, in compliance with the "staying home" initiatives for national education.

On a global level, Greece ranks 40th in terms of Internet connectivity, as seen in Fig. 8. According to the Economist Intelligence Unit, 2020 survey, Greece is among the weakest European performers in the index, ranking 22nd out of 24 European countries. The overall Index score of the Inclusive Internet Index 2020 is based on the scores of the below characteristics:

- Availability,
- Affordability,
- Relevance, and
- Readiness categories.

As stated by the Inclusive Internet Index 2020 among the areas in greatest need of improvement in Greece are relevance (particularly of local content), trust-safety, and e-inclusion policy [15].

The Fig. 8 chart overall specifies country-rank position in numerically ordered series in the pre-5G era. While otherwise this would not be a very user specific index, as it does not indicate the quality of Internet services within a tertiary institution's enclave, during the Covid-19 lockdown University students where dispersed at their parental homes over the country, to attend lectures remote; thus this otherwise not very proportionally formed series of data serves as an capable of giving the essence indicator until more user - centric measurements are released in Academia.

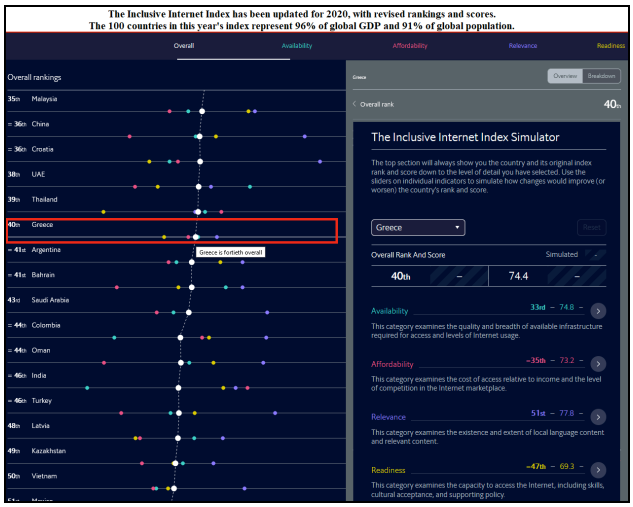

Figure 8. *The Inclusive Internet Index, 2020.*

Not withstanding the statistics of Fig. 8, which rely on the intention of national authorities to mesmerize the attention of the world by transfixed data, for the essence of Academic strategies the Internet and new technologies have become the most critical elements necessary for the organization of education. These elements are not only the backbone of education and learning, but they are also critical sectors for communication, work, entertainment, marketing, research development, etc.

Consequently, it remains unclear at the moment how the Internet traffic is used by students. Therefore, it is very important at a later stage to consider in what way and where interaction is oriented to Greek so to determine entirely the exclusively learning and educational Internet traffic.

5. PUZZLING OUT THE BIG PICTURE

Amidst the Covid-19 pandemic that was hard hitting infrastructure around the world, the immediacy of information dissemination was very critical. The effective adaptation of the Administration and the faculties to the emergency

operating conditions had been implemented in a very short time in AUTh, i.e. within a week. AUTh was in an advantageous position to achieve Distance Education as AATSO already had a lot of experience and know-how in this new way of working and teaching.

Although e-Learning culture is commonplace in other countries, in Greece the relevant experience was rather limited. Each University, due to its self-governing nature, was using its own Distance Learning methods. Distance Education is not merely a matter of posting synchronous lectures or video lessons over the Internet. E-Learning should incorporate good pedagogical practices and approaches such as interaction, communication, dialogue, autonomy, feedback, structure.

The integration of ICTs in the learning process and in teaching in general, often does not bring the expected results and may lead to confusing situations. However, the shift from traditional to digital classrooms is currently a one-way road ahead. Due to the compulsory adaptation of the educational process to the requirements of this new reality, there is an urgent need to place ICTs in all stages of the education system and at the same time to train teachers fast track on how new technologies may adequately meet the new requirements.

A very beneficial activity has to do with the production of educational audiovisual material, usually in English, originating from the Balkan countries (Fig. 9).

Figure 9. *Prof. V. Aleksić acting as invited lecturer under the Erasmus+ exchange scheme at the School of Informatics, Aristotle University of Thessaloniki.*

As these enclaves bear a cultural tradition that retains clues from common historic, linguistic and intellectual manifestations, it holds attitudes and behavior unique to scholarly achievements for the cultivation of a common culture.

Technological leaps have been indeed tracked during this research, as most parties involved exceeded themselves. During this crisis, it was essential to gain basic knowledge on these technologies in an environment which supported well-received pedagogical practices, instead of superficially improvising. This way, a University may turn the challenge into an opportunity, and perhaps, this legacy will be the biggest investment for the future of education.

Already, some notable steps ahead, in a bigger scale, that of national or governmental enclaves have been triggered.

As seen in Fig. 10, Digital Academies have been initiated, taking on the vast open-source learning material created by autonomous Institutes. By building upon these learning blocks expansive Academic structures, in pursuit of scholarly work and broader learning activities, the "go Digital" motto gets a wider perspective.

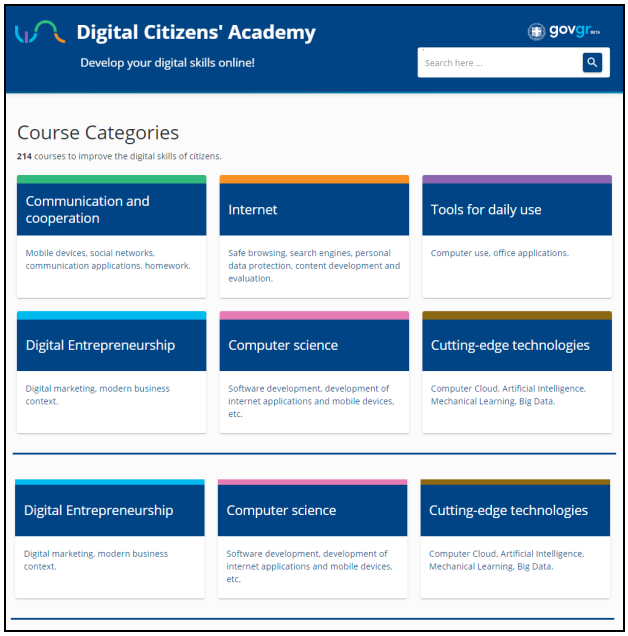

Figure 10. *From hundreds to tens of thousands: the Greek National Digital Academy portal (http://nationaldigitalacademy.gov.gr).*

At first, these initiatives aim to offer digital dexterities to massive scale. However, not in English, but in the official language of the enclave, promoting skillfulness in performing tasks for the local workforce, which controls and finances the federal government - and in return receives ample feedback.

As such governmental measures, National Digital Academies have by default a broader mission statement, serving as hyper-ways within the knowledge society. Thus far, the highest form of teaching was offered by a University or a consortium of tertiary education and similar research Institutes. Whether a more general structure, beyond this scheme may come up, it is not very unlike to take place [11].

The seeds of this new culture may be traced in exchange schemes, like the Erasmus+ mobility

project (Fig. 10), or in terms of music entertainment in the Eurovision song contest. These fundraising projects, amongst other large scale scientific or educational arrangements [12], destined to promulgate mobility between researchers of associated countries, have managed to appease the ability to establish educative links between different levels in societal, working and research relationships [13].

They seem to be the forerunners of a new apprehension in Distance Education, allotting as a necessity in widespread suppressions of schooling practices [14]. Well prepared statistical data from educational practices under this pandemic are driving ahead the global culture since they come out of the most innovative and radical part of our society, the tertiary education pool. Better apprehension and application of model analyses, considering the representativeness of the samples, would better prepare the learning sector, in collaborative terms, for the next turning point crisis.

6. CONCLUSION

The application of new technologies in education and especially in Distance Learning offers new possibilities, as these new innovative tools provide rich communication and interaction. The AUTh IT center offered the educational community different technological options so that on a case-by-case basis, favorable learning conditions were offered.

However, this case study has limitations, which require further research so to reach a safe conclusion about which technologies can be effective in times of crises. The pandemic brought to the foreground the least guided educational methods of teaching, which, although very popular, are not considered by themselves effective approaches. In other words, to be constructive they should get related to some learning theory and good pedagogical practices, yielding thus substantial learning outcomes.

Therefore, it would be interesting through further research to explore and take into account not only the collaborative platforms, but also the teaching methods assorted with these technologies. Thereby, instructors may understand how to facilitate learning and how to receive successful outcomes via accreditation and certified experiental learning practices.

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