International Journal of Learning, Teaching and Educational Research
Vol. 17, No. 5, pp. 26-46, May 2018
https://doi.org/10.26803/ijlter.17.5.3

Greek University MOOCs and Secondary Education Teachers' Training

Spyridon Kappas
Principal of Institute of Vocational Training of Agrinio,
MEd, PhD Candidate- University of Patras, Greece

Dimitrios Tsolis
Associate Professor,
Cultural Heritage Management and New Technologies Department,
University of Patras, Greece

Abstract. Massive Open Online Courses (MOOCs) have been tremendously developed worldwide but this is not the case in Greece. Our aim is to investigate their features at the University area. Our ultimate target is to utilize the conclusions and make some specific suggestions regarding the way we can draw on our relevant experience of University Open Courses (UOC) so that the latter will be able to be converted into a Secondary Education (SE) Teachers' distance - training database. To this aim, we attended MOOCs run by Mathesis, Coursity and the Ionion Universities. Our research aimed at externally describing the respective MOOCs' features and comparing them with one another. Next, we compare these platforms to the Open eClass Learning Management System (OeC LMS)used by the UOC and we put forward methods to convert these Courses into MOOCs. Additionally, we investigate the cost, the required attendance time and the Certification of the MOOCs, research has taken place as to whether some of the OCs can be converted into MOOCs or Small Private Online Courses(SPOCs).From the conclusions drawn we see that Greek MOOCs have mainly been structured around the behaviouristic model. Suggestions have been made in the direction of collaborative learning with the creation of small groups of SE teachers of the same major, with the view to having OCs function as a database for SE teachers' training via SPOC, drawing on experience derived from MOOCs.

Keywords: MOOC, Open Courses, SE Teachers' Training, Connectivism, SPOC.

Introduction

The ever-increasing complexity in the job market and the need for specialized knowledge has led to an unprecedented increase in the demand for life-long

learning programs. Responding to this phenomenon, Greek universities have created, through their Life-long Learning Centres (LLC), a plethora of such programs covering every educational field. Furthermore, technology, as it is simultaneously being advanced, has fully been utilized in the creation of such programs. In a relative paper, Karipidou (2012) states in detail the efforts of Universities via their Centres for Vocational Training (CVT) (or LLCs) and those of the Greek Open University (GOP) in this direction as well as the creation of e-learning programs whose aim is to help develop technical structures for both synchronous distance-learning (where there is a real–time interaction between instructors and trainees) and asynchronous education, where an indirect communication takes place. These programs are currently being conducted on a distance-learning basis, without trainees' physical presence being required, a feature in accord with the profile of these trainees. The latter are mostly professionals seeking after specialized knowledge so as to live up to their job's working conditions. As it is stated in a relevant site(National and Kapodistrian University of Athens,2018) such programs address Higher Education Institutes (HEIs) and Technological Educational Institutes (TEIs) graduates as well as Senior High School ones, with some working experience needed on each program's requirements. Our aim is for the interested parties to update their knowledge and become more competitive in the job market.

Teacher training as an imperative

It is obvious that Primary and Secondary Education (SE) teachers belong to those professionals whose knowledge update is more than necessary, due to the fact that pedagogy as a field becomes more and more complex. Teachers are now considerably interested in issues such as special needs education, learning difficulties, the introduction of new technologies into teaching,…etc, which were once on the margin of their interests. Specifically, the challenge appears more obvious when SE teachers teach a more specialized topic, on account of the frequent update taking place regarding these knowledge fields, especially in sciences. A simple search shows that there are more than 100 e-learning training programs in this area. A point in common in all programs, apart from their being distance-learning ones, is that fees are required (around 400-1200 Euros) as well as that a certificate is granted. On the contrary, the time required for their completion varies from 2 months to 1 year.

Studying the above analysis we infer that, although teachers have been led into a process of self-training positive for their individual improvement and the quality of lessons alike, the Ministry of Education seems to have opted not to take part in this procedure. Besides, all the relative courses are on a paid basis, a feature which discriminates against some teachers. Moreover, the time needed for some of these programs (having a direct impact on fees) renders non – affordable attendance for some teachers. Our aim is to suggest ways of SE teachers' training via e-learning University-based programs which will cope with these specific issues and make knowledge provided easily and more accessible.

MOOCs solution

In recent years, the flourishing of the ideal of Open Education which contends that knowledge should be freely shared and people's yearning and need for learning should be fully satisfied without demographical, economical and geographical constraints (Peters, 2008) in tandem with the rapid advancement of technology, has led to the development of Open Educational Resources (OERs), namely materials supportive of education, which can be freely accessible, re-usable, modifiable and shared by everyone (Downes, 2011).

Massive Open Online Courses (MOOCs)are precisely based on this ideal, being the outcome of OERs' exploitation. According to Dodson (2013), MOOCs are online courses constructed and presented in such a way as to be accessible to many students and for learning material to be available at no cost to anyone interested in a specific discipline taught. As for the description of MOOC acronym, Yousef,Chatti., Schroeder, Wosnitza and Jakobs (2014) explain: Massive – it concerns its ability to support a great number of trainees. Open – openness referring, first, to the provision of learning experience to a great bulk of users regardless of their characteristics, without demanding registration at the beginning or fees for the access to a University – level educational material and, secondly, to the option of open educational material provided. Online – access to the courses takes place via the Net in either a synchronous or an asynchronous manner. Courses – the course has been stipulated as a credit at an academic level. Cormier (2010) highlights the collaborative nature of the whole venture, namely the fact that people can profit from participating and attending other people's work, inasmuch as in many ways there are no specific projects assigned, but it is recommended that trainees should be interested in other participants and their material.

McAuley, Stewart, Siemens and Cormier (2010) report that the users play an active role in and self-coordinate their participation: according to their learning goals, their background knowledge and skills and their interests. In addition according to Dodson (2013), MOOCs are online courses constructed and presented in such a way to be accessible to many students and for learning material to be available at no cost to anyone interested in a specific discipline taught.

According to Yuan and Powell, MOOCs aspire after providing free access to courses and state-of-the-art technology, leading, in the short run, to reduced costs for University-level education and, potentially in the long run, to a restructuring of the existing models of Tertiary Education (Yuan & Powell, 2013). Grounded on this, since 2008 when MOOCs appeared on a pivotal basis, but mainly since 2011 onwards, a considerable number of Universities abroad have developed such courses available for free to students, while at the same time corresponding commercial MOOCs have been developed by other institutions as well. Tracing back to MOOCs' origins, Sophos, Kostas and Paraschou start from 2011 when Stanford University commenced offering three online courses with a great success, which led to U.S.A.-based University professors taking initiatives either on a profit–making basis (Udacity, Coursera

by Stanford) or a non-profit one (edX by MIT) (Sophos,Kostas &Paraschou ,2015, p.229). Reviewing the field, Kaloyiannakis and Papadakis (2014) report that edX provides courses only by Harvard and MIT Universities, Coursera focuses on the provision of a platform usable by every university, while Udacity only offers its own curriculum in specialized fields.

Tsoni, Geka, Siolou, Sipsas, and Pagge(2013) contend that Coursera and edX have a lot in common regarding not only the way the educational material is provided and organized but also the manner of assessment. Courses offered are mostly around science, philosophy, and history.

However, Udemy, based on a special line of thinking, is a commercial online portal permitting everyone to become trainers, thereby creating their own online course aiming at making the profit and gaining international recognition (Yuan & Powell, 2013).

Drawing on the above analysis, we will attempt to investigate how MOOCs stand at the greater Greek University area as compared with the international situation l and take advantage of the experience gained, suggesting ways of converting some Open Courses into MOOCs with the ultimate aim to making them a platform of SE teachers' training.

Greek University MOOCs: Comparison with foreign ones

In contrast with foreign MOOCs, in Greece, there haven't been many organized efforts to have MOOCs created. The first MOOC was created by ALBA (Polytechnic of Crete, 2014) through Coursera platform and was about entrepreneurship. Universities manifested some skepticism which renders itself all the more obvious even in a relevant research on GOP (Koustourakes, Liakopoulou & Panayotakopoulos, 2015, p.13) where it was found out that it is easier to create MOOCs in humanities than in scientific fields where laboratories are demanded. Moreover, MOOCs could be used for the training of specific professionals, such as teachers. Similar conclusions were reached by Avouris, Komis and Garofalakis (2015) in a research conducted into University of Patras Teaching and Research Staff who have created Open Courses – OC (Open Courses of Universities). Results show that OCs could be used for graduates' training. They could also be equipped with more options for interaction as well as massiveness. Similarly, Salmatzidis (2016) contends that some of OCs can be converted into MOOCs but the latter's development at a University level is expensive.

To sum up, the MOOCs with their characteristic features could very well constitute a fundamental form of SE Teachers' Training. Their main asset is that they deal very effectively with the financial cost (free access), while at the same time their accessibility, which may be partly due to this lack of fees, expands the number of teachers who can participate in them. Moreover, another factor contributing to this direction is the development of such courses aimed at participating with common background knowledge and interests. Therefore, we should investigate the extent to which we have relevant University MOOCs

available that are aimed at SE Teachers and which can constitute the basis of their training.

Studying the relevant research papers (Avouris et al, 2015, Koustourakis et al, 2015) we observe how difficult it is to have free MOOC courses developed by Universities as well as how useful such courses can serve in teachers' training, which we will elaborate on further below. The upshot of this situation is the creation of only a limited number of MOOCs at the University area. We focused our research on the first attempts made by Ionion University, "Mathesis" (University of Crete Publications) as well as Coursity platform.

Our research focused on their technological and pedagogical features. We investigated such aspects as the type of the multimedia material, the level of interactiveness offered by the course, the assessment and certification methods as well as the existence of corresponding conventional curriculums and whether they differ or not from the MOOCs respective. Finally, we checked the extent to which they address SE Teachers and the potentiality for their being used in some form of training. The results are deemed interesting and need to be immediately utilized as we will see below.

Ionion University MOOC

At the Ionion University, there is only one MOOC offered, "Interactive Multimedia". It started in May 2015 and according to the project's news bulletin (Ionio University,2017), it was created by members of the Ionion University Interactive Arts research laboratory and was co-produced in collaboration with students of the Faculty of Arts, Sound and Picture, within their practice in various courses. The teaching material is based on the notes and books taught at the conventional curriculum. The course is accessible via UDEMY platform (https://www.udemy.com/interactive-multimedia-in-greek/) and despite the fact that it is mainly run on a profit-making basis, that course is free of charge. UDEMY courses are mostly oriented towards technology, as it is also stated by Tsoni et al. (2013), and the same applies to our case, too. The teaching approach adopted is to provide students with all the material right from the start so that they will be able to study at their own pace (Tsoni et al., 2013).

The course is modulated in four units and the respective learning material is offered in the form of PowerPoint presentations, making use of the conventional course's printed material. The multimedia material is presented in the form of short videos (5 minutes each). Having short videos is an acceptable practice, for the long ones are considered tiring. Guo (2014) in a relative research paper found out that students who usually complete their studies in MOOCs give up watching videos which last more than 6-9 minutes, while the approximate time devoted to watching 12-to-15-minute videos is about 4,4 minutes (Guo, 2014). A special feature of the webinars is that they are conducted by the faculty's students, which renders them easier to be comprehended due to the simplified language.

As far as interactiveness within courses is concerned, we observe that there is some to a certain extent. At whatever point of the webinar, the trainees can write their comments and also submit their questions. Nonetheless, there is no organized Online Learning Community in the sense of inclusiveness which, as stated by Sophos et al. (2015, p.229), consists in the development of informal educational networks by way of blogs, wikis, Facebook, Twitter and in general Web 2.0 technologies.

Assessment is carried out through the so-called interactive method of examination. This examination takes place via tests at the end of each webinar, which are exclusively composed of multiple-choice questions. Interactiveness is implemented by the fact that it is immediately stated whether the answer is right or wrong and the user can try again. Hence, the trainee can see where s/he is wrong and corrects it, thereby obtaining feedback.

We therefore observe that, in effect, it is a standardized form of examination (correction by computer), namely an automated assessment, which, as Downes points out, is based on measurements as to the completion of assignments or the participant's success in them. It is supported by miscellaneous assessment techniques, where participants can decide on their own if they have successfully completed assessment and then proceed to the next stage of the course (Downes, 2013). Sonwalkar (2013) criticizes, among other things, the problematic way trainees are self - assessed via the short tests and, according to us, this criticism is well grounded as far as the specific course is concerned.

No certificate is granted for this course. This can also be due to the fact that MOOC is a pilot venture and can be successfully completed in just two hours (June statistics show that it has been completed by 512 participants), while it can be done at any time, thus resembling the Self-study case we are going to see below.

In conclusion, it is an experimental venture which can be further enriched and developed. It has some pros (webinar in simplified jargon, comments etc) that can be utilized in a more organized MOOC. It also has a low level of difficulty which means that it is easy for anyone to attend it without any previous knowledge required. Consequently, it appropriately takes advantage of OER. Furthermore, MOOC as well as the conventional course which the former is based on, can be used by UM19-20 ICT SE teachers but also by UM12-17 Electrical Engineering and Electronic Engineering teachers as a form of self-training.

Mathesis MOOC

A different instance is "Mathesis" (http://mathesis.cup.gr) which has been created by Crete University Press (CUP). It currently consists of 18 MOOCs (up to March 2018), and will include a total of 30 when fully developed. These courses fall under a wide variety of academic subjects such as History, Physics and ICT (Information and Communication Technology). They can, hence, be exploited by the respective SE teachers. After all, as a relevant statistical

questionnaire filled in by the students attending each course evidently indicates, a considerable percentage of these people are indeed educators (according to the 2017biennial report this percentage is over 33%), who obviously wish to update their knowledge and facilitate their instruction on the respective school subjects.

The courses are free and the endeavour is funded by the Stavros Niarchos Foundation. These MOOCs' platform is edX. According to Spyropoulou, Pierrakeas, and Kameas (2014),edX is one of the most popular platforms and it is a non-profit one that was developed by the University of Harvard and MIT. Upon exploring it(edX,2018), we find 1964 courses on any subject and over 90 collaborating Universities from all over the world.

More specifically, the platform distributes the teaching material into sections and uses multimedia software in the form of short webinars by the professors themselves coming from various Higher Education Institutes (a.k.a. University Schools) from all over the country. The material is posted gradually. In comparison to the conventional Courses, here we also find three History courses following the same Syllabus as the conventional academic department (ΕΚΠΑ - UOA). The difference as far as the Printed Material is concerned, lies in its comprising, not a Conventional Coursebook but, an anthology of the transcripts of the webinar Lectures (done by volunteering university students). In other courses there is also Material from the "Kallipos" Repository consisting of shorter sections and is mainly developed according to the principles of self-regulated learning.

Comparing the Open Online Courses to the Conventional Open Courses (in the aforementioned History modules), we realize that, in the Open ones, the Multimedia Software is a collection of long Webinars (because they are lectures of the current course, with overlapping information, repeated points and answers to questions). On the contrary, in the MOOC, the lectures on the same topic by the same professor are shorter, as is more befitting to a self-regulating form of learning, while the quality of the video recording (done in a studio) is also much better. Moreover, their segmentation — the so-called paragraphing (always in accordance to the Syllabus) — facilitates Learning, creating what is known as "learning sequence." Consequently, the Syllabus of a semestrial course is covered in 6 weeks. Additionally, the gradual posting of the Material implies a well-organized interactive Program.

The level of the hereto offered knowledge resembles the academic one of the University Departments. This is where the main criticism against similar Programs abroad lies, i.e. that they do not contribute to the secularization of the offered knowledge but that they essentially broaden the gap (additional knowledge, is accumulated by those already in the know). Furthermore, it usually requires 7-8 hours of study per week.

The fundamental feature of the endeavour is its interactive quality issuing from the development of a Digital Learning Community. Its main asset is the Discussions on covered Thematic Units and Answers to Questions (but not

answers to an entire assignment). This feature attributes an element of Simultaneity to the whole educational endeavour, while it resolves any possible feeling of alienation that might overwhelm some of the trainees. Lastly, it also acts as feedback on the Programitself, because it identifies the possible oversights or inaccuracies which can be corrected later (repetition of the course).

As to the time available for the completion of the programs, the 4 to 9 weeks of the courses (the most common duration is 6) are a feasible goal, especially since the evaluation takes place at the end of each week and is binding as far as time is regarded. There are two forms of evaluation:
1) The conventional one (automatically corrected multiple choice tests, numerical or algebraic tests — the latter ones for Science).
2) The non-conventional one (peer-evaluation activities). These are not automated and in most cases they involve writing an academic essay (especially in Humanities). The question here is who will do the evaluation (for instance, due to the large scope of the endeavour, there have been 5000 sign-ups for the History course alone). Each trainee's evaluation process also involves his own evaluation of a fellow-student's work. We are essentially dealing with the so-called peer evaluation. It is a method entailing multiple advantages, because it promotes the students' interaction. This is of great importance for the online courses in particular, whereby a feeling of alienation is commonly observed among the participants (Pagge, 2012), while, at the same time, both promotes autonomous learning and nourishes those skills that will allow the students to also assess themselves more objectively (Tsoni et al., 2013). The criticism regarding this is that students attending the same course and trying to study in the same field do not have to already possess the necessary knowledge and expertise (Tsiatsios, 2015, p. 56), while, due to the great number of the students registered for each course, it is possible that they won't show the genuine interest towards their fellow students that is required for making constructive feedback comments (Krause, 2013). In our present investigation, this argumentation is unfounded when the trained Secondary Education Teachers belong to the same discipline, without, nonetheless, ignoring the actual individual differences.

Finally, there are also comprehension tests at the end of each webinar which are auto-corrected and can be re-submitted with an indication of the correct and incorrect answers (as in Ionion University), while they are enriched via an automatically changing test items bank, a refreshing feature for the whole endeavour.

Yet another characteristic is the entry and exit questionnaires. Through their statistical analysis, they supply feedback for the Program, in addition to the aforementioned method. After all, the teacher keeps the Material after completing each course (free of interaction and testing) for Self-study, a feature that assists in the teacher' self-training and self-supporting of his educational work.

As for the Certification, participants are given a Certificate (at first free of charge, but now costing 15 euros) after answering 50% of the test items. According to the mid-term report on the project, less than 50% of participants attend the respective programs up to the end and therefore attain the Certificate, a percentage that is even lower in the case of Science. At a first glance, this percentage appears to be high. However, one of the inherent disadvantages of the MOOCs for which they are criticized is that the number of the trainees drops by the end of courses, rarely reach more than 7-9% of the initial students (Knowledge @ Wharton, 2012), due to the easy registering process. Clow (2013) considers that the percentage of the drop-outs of the MOOCs courses is significantly higher than the percentage of dropping out observed in the conventional ones. Therefore, not only is the percentage everything but low, but it is also much higher than the edX courses abroad.

Although the MOOCs courses are under a full copyright protection policy, there is a plan to create copies for academic purposes with the additional support of university professors. Therefore, under certain circumstances, the Mathesis experience can be also exploited as a form of organized teacher training, as well as a permanent type of ordinary teaching resource (Self-study). Moreover and most importantly, it applies the collaborative learning model to the extent that it allows the massive character of the endeavour.

Coursity MOOC

Relevant research shows that only "Coursity" possesses the University MOOCs features that also address the Secondary Teachers' needs. The name "Coursity" derives from the abbreviation of **cours**e and univers**ity**. It has been launched by the LLC of the University of Ioannina and is still being developed (it started in April 2017). As stated on the relevant webpage (Coursity, 2018), it is an innovative platform hosting webinars, online camcorded courses. These courses cover a vast range of scientific fields and academic subjects, last 4-8 weeks (60-100 hours) and are taught by renowned Professors. It offers the opportunity to attend numerous courses for free, while successful attendance of the seminars leads to the acquisition of a certificate issued by the LLCs of Greek Universities. The courses are aimed — among others — at both Primary and Secondary Education Teachers so that they can be trained through an appealing and stimulating learning process on current educational trends and participate in an innovative learning venture. They are also aimed at all those who wish to enrich their know-how and have access to learning via high quality courses realized through an innovative process on a high-tech platform (Coursity,2018).

At this point (March 2018), the platform hosts 7 MOOCs, 6 of which are taught by University of Ioannina Professors and 1 by an Aristoteleian University Professor. As we can therefore observe, at this preliminary phase, essentially only one course is certified by a LLC other than the one belonging to the University of Ioannina. 2 out of these 6 courses (Python and Scratch) pertain to ICT, while 3 more (Introduction to Special Education, Specialization in Special Education Issues and, Learning Difficulties) pertain to Special Education Teachers. Consequently, they will be useful to teachers of the relevant Secondary

Education Subjects. The courses are free. The aforementioned MOOCs platform is the open code platform "open edX" that belongs to edX.

To investigate "Coursity"s features we enrolled in **Introduction to Programming through Python** course. After attending it, we drew the following conclusions (which are applicable to all courses and reflect the way Coursity functions).

1) The platform presents the modular arrangement of material and the use of multimedia material in form of short video-lectures given by the teachers themselves. These features fit into a distance-learning education, while the quality of video-recording (done in a studio) is high. Material is uploaded gradually in stages. Also, the course's modularization – the so-called paragraphing (always in connection with the Material and the miscellaneous assessment tests) facilitates Learning, creating the so-called learning sequence. The latter is a medium – scale teaching approach, namely it can be conducted in just a few teaching hours (Kamidou, Spyrtou &Kariotoglou, 2007) and in modern bibliography is viewed as a dynamic tool for the improvement of teaching and enhancing of learning in Natural Sciences (Meheut,2005). During a course's contents analysis, as stated by Kattmann, Duit, Gropengieber and Komorek(1997) the appropriate simplification procedure takes place which will give emphasis on the basic idea(s) of the topic, so that a content structure suitable for teaching will be created. In the case of Coursity courses, such a sequence has been created with short video-lectures (5-10 mins) followed by the corresponding comprehension questions so as to have the expanded material of a course covered within 4-8 weeks. Moreover, the gradual posting of Material imbues the whole venture with the climate of an organized interactive Program.

2) The fundamental feature of the endeavour is its interactive quality issuing from the development of a Digital Learning Community. Its main asset is the Discussions on covered Thematic Units and Answers to Questions. This feature attributes an element of Simultaneity to the whole educational endeavour, while it resolves any possible feeling of alienation that might overwhelm some of the trainees.

3) As for the time needed to complete the programs, 4 to 6 weeks is a suitable period, especially as far as the assessment carried out at the end of each program is regarded and it is obligatory that this assessment be completed in that period. It is now conducted in two ways: a) The conventional ones (closed-ended quizzes, arithmetic - type questions for Physical Sciences or short open-ended ones). They are automatically corrected via computers and offer feedback in the sense that participants can have a re-try to correct potential wrong answers which are highlighted along with the correct ones. b) With the creation of mini projects at the end of each week and a long project upon completion of each course, projects more demanding and needing a special type of assessment.

4) As far the potential of certification, the trainee is given two options: a) To attend the course for free having the entire material at his/her disposal and to carry out all the assessment tests, but not to be graded for the projects. In this

case, no certificate is granted. b) If s/he chooses attendance with Certification, then apart from the above-mentioned s/he can be graded for projects and get the certificate as long as he/she completes 60% of the total marks. Alternatively, s/he can ask for Certification only after having attended the course for free. In any case, though, trainees will pay a sum ranging around 60 euros. Certification is granted by the Life-long Education Centre of the corresponding MOOC's University, so that those certificates are recognized while total number of hours of attendance is stated (necessary for credit-giving in the job market) along with ECTS.

5) Looking at these Coursity's features we can, to some extent, agree with Tsoni et al. (2013) that edX uses teaching methods tending more towards conventional education. In a relative report on xMOOC features (eXtended) (Sanchez-Gordon& Lujan-Mora, 2014)they note that it is the more popular form of MOOCs, with features focusing on expandability and based upon a conventional university teaching. They are organized around a central trainer and a basic curriculum mostly using pre-recorded video-lectures and quizzes with no emphasis on networking. We see that courses are mainly xMOOCs with all the characteristics described above, as well as with some form of networking lending the whole venture some collaborative features. Such characteristics we meet in cMOOCs which are based on the connectivist teaching approach and promote the development of informal learning networks. As Kop and Hill (2008) note, they place emphasis on the interconnected, collaborative learning and courses are structured around a group of individuals sharing the same mentality and are relatively free from University's institutional constraints, while at the same time they provide a platform through which to investigate new pedagogical methods beyond traditional teaching within class. Such a thing has not been considerably developed in Coursity, a fact which may be due to that the venture is still in the making.

In any case, we observe that these MOOCs to a considerable extent handle the issues raised in the initial phases of our research. They are of a shorter duration and the cost for trainees is low but not negligible. Furthermore, certification is granted in correspondence with ECTS, a feature functioning as a motive for such training.

Comparing Greek University MOOCs

From the above descriptions, we can see the similarities and differences between the two MOOCs. In both of them the material is split up into modules, a feature bearing upon the modularized nature of distance learning, programs of which the aforementioned can be regarded as. Turning to the multimedia material, now, despite Ionion University's immediacy, they are both characterized by teacher-centeredness. The teacher teaches and the pupil attends as a passive recipient. Mathesis, nevertheless, offers interaction to a considerable extent (creation of an OLC), as opposed to the limited one in Ionion's webinars. Assessment at the Ionion University is done through automated grading by computers, while there are diverse methods in Mathesis. Finally, no certification is granted by Ionion, while Mathesis grants a certificate.

Based on the above analysis we can infer some useful conclusions concerning the learning theories they are grounded on as well as the pedagogical pattern followed by the two platforms. According to Siemens (2013), there are two forms of MOOC, CMOOC and xMOOC. CMOOCs (connectivist ones) are based on the connectivist learning theory and promote the development of informal learning networks. As Kop and Hill (2008) state, cMOOCs put emphasis on the interconnected, collaborative learning and courses are built around a group of individuals sharing the same philosophy and they are relatively free from the University's institutional constraints, while they provide a platform by means of which to investigate new pedagogical methods beyond the traditional in-class teaching. Unlike them, xMOOC stands for eXtended MOOC and focuses on scalability. xMOOCs are based in a traditional university teaching. Thus, they are organized around a central instructor and a core curriculum using mainly pre-recorded video lectures and quizzes with no emphasis in networking (Sanchez-Gordon &Luján-Mora, 2014). To sum up, a cMOOC is collaborative and student-centered while an xMOOC is behaviourist and teacher-centered.

We therefore observe that in the two programs in question, there is an inherent contradiction: while they are described as collaborative (connectivist), that description does not fully correspond to what really happens. Ionion MOOC is no more than a repository of knowledge, in a modularized form, and with a certain type of standardized assessment. There is no interactiveness and collaborativeness at all.

We have to do with a behaviourist type of MOOC. As far as Mathesis is concerned, there is increased interactiveness demanding participation, but there is still a lot to do for it to get away from narrow academic contexts. Hence, the courses in question can be viewed as a hybrid of a behaviourist and collaborative MOOC.

To shed more light on the comparison between the two platforms, through investigating any probable similarities and differences, we attended Mathesis **Introduction into Python**, a course similar to Coursity **Introduction into Programming via Python** (described above), and found out that apart from the almost identical material and duration of both courses (6 weeks) along with the general characteristics of edX mentioned above, there are some more substantial similarities as well differences concerning quality features. They can be seen both in the specific courses in particular and in the way all the courses have been structured in general in the 2 platforms. They are as follows:

►The level of knowledge provided in all courses is similar to that of Universities. This is where the main criticism against similar Programs abroad lies, i.e., that they do not contribute to the secularization of the offered knowledge, but that they essentially broaden the gap (additional knowledge is accumulated by those already in the know). As Bates mentions on the issue (2014) the MOOCs tend to attract the higher-education-level people instead of those with a lower educational background. This criticism may be well founded

in the case of Mathesis, but it is irrelevant to our research on the Training of Teachers who are already knowledgeable. Furthermore, it usually requires several hours of study per week, a dissuasive parameter for many people. On the other hand, reducing the Material per week (and, inevitably, the hours of study) would increase the duration of the program.

► We can conclude that Mathesis has developed more collaborative features than Coursity, has a greater and more organized OLC while in the assessment, too, we observe a greater amount of diversity by means of not only automated correction but also peer assessment. On the contrary, assessment in Coursity also via the completion of mini-projects and projects gets away from the automated form (which does exist) but it keeps on being teacher-centered, though. Here it is worth noting that a greater amount of massiveness is achieved in Mathesis (on account of the advanced stage in its development) which renders peer assessment necessary for practical reasons, too. ► However, the most fundamental difference concerning the target of our research paper is the afore-mentioned Certification that Coursity grants (on a paid basis) as opposed to the Certificate by Mathesis (granted for free).

► From the above-mentioned, it is inferred that from a pedagogical point of view collaborative features can be observed in both ventures, but the most prominent position is still held by a teacher-centered / conventional approach which subsumes them under xMOOC, even if there are some connectivist features to be further elaborated on.

► On the contrary, as far as quantitative features are regarded, no immediate comparison can take place, because of the different stage of development each platform currently is using. Mathesis, under way for two years now, has already 16 courses compared to the 6 of Coursity. It is worth noting here, though, that the development of some of the qualitative characteristics of Mathesis is also due to the quantitative development and massiveness it has brought about, as stated above. A future research on a corresponding stage of Coursity' s development would provide us with a lot of useful information. In the table below,we can see the most fundamental points of our comparison.

Table1. Comparing Greek MOOCs

	IONIO	MATHESIS	COURSITY
Platform	UDEMY	edX	edX
Material uploaded	In advance **ATTENDANCE AT OWN CONVENIENCE**	Gradually (per week) **FULL PROGRAM FEATURES**	Gradually (per week) **FULL PROGRAM FEATURES**
Material arrangement	Modulated **PROPER for Distance Learning**	Modulated **PROPER for Distance Learning**	Modulated **PROPER for Distance Learning**
Form of Webinars	Short duration, made by students **TEACHER-CENTERED APPROACH**	Short duration, made by trainers **TEACHER-CENTERED APPROACH**	Short duration, made by trainers **TEACHER-CENTERED APPROACH**
Interaction	No OLCs **TEACHER - CENTERED APPROACH**	OLCs (Discussion-problem solving) **COLLABORATIVE LEARNING FEATURES**	OLCs (Discussion-problem solving) **COLLABORATIVE LEARNING FEATURES**
Assessment	Comprehension tests-automated with error correction **TEACHER-CENTERED APPROACH**	Material comprehension tests Assessment with automatic correctionarithmetic – algebraic style/Assessing one another (by peers) **COLLABORATION FEATURES**	Comprehension tests-automated with error correction/ Mini-projects and projects **TEACHER-CENTERED APPROACH**
Certification	No	Certificate (at a low percentage)	YES (ECTS)
Pedagogical Approach	Fully Behaviouristic	Partially Behaviouristic **(collaboration features)**	Partially Behaviouristic **(collaboration features)**
MOOC type (CONCLUSION)	**xMOOC**	**xMOOC with some Connectivistic features**	**xMOOC with some Connectivistic features**

Comparing Greek MOOCs with OPEN COURSES

Last 13 years have seen the creation and development of Open eClass (OeC) courses at HEIs-TEIs taking advantage of eClass platform. The latter is an

integrated Online Courses Management System. It has been designed with the view to reinforcing educational procedure, is grounded on the philosophy of open – source software, is actively supported by GUnet and is available for free (Sophos et al.,2015, p.182). Open Courses (OC) are an attempt at interconnecting the respective HEI-TEI OeCs. According to their site, they are courses taught at Greek Universities and TEIs, freely accessible and available online to all. There are no distance-learning curricula, they do not offer further teaching support and do not grant any certificate of training. They do provide, however, new knowledge, training and specialization and constitute a free learning environment consistent with HEIs' public character and function (Open Courses, 2015).

They allow for the production and reuse of learning content. The standards of a LCMS include teaching material posted online and a discussion forum enabling interaction among trainees as well as among trainees and trainers etc (Demetriades, Karayiannides, Pomportsis &Tsiatsos, 2008). They are not distance learning coursesthey do not offer furthermore instruction and do not grant a training certificate. They are free to students, pupils and to everyone in general interested in expanding or updating their knowledge. They teach new facts, provide training and specialization and constitute a free learning environment in line with the public character and function of HEIs (Open Courses, 2015).

It is obvious that OCs are not MOOCs because they lack massiveness, material arranged in modules, interactiveness, assessment and any form of certification. Nonetheless, the addition of a multifarious educational content via Open Delos platform (www.opendelos.org) imbues them with some features resembling the ones of Greek MOOCs. The main difference is that they consist of long video-taped lectures conducted by professors of the respective courses. In Greek MOOCs however, as we have already noted, videos are short in duration and especially in Ionion University and are produced by students and not by professors. In all the cases, though, videos are characterized by a teacher-centered dimension. Salmatzides (2016) states that they are more like a xMOOC model and that edX model should be studied for the interaction it provides, a thing which was observed by watching Mathesis. In any case, the plethora of multimedia OCs can be utilized (via obtaining some of Greek MOOCs' features) for an organized SE teachers' training.

From a research on University of Patras teaching staff who have created OCs, Avouris et al (2015) have shown that OCs could be utilized to train graduates but also could acquire more interactive skills and massiveness. The problem of financial cost is raised, though.

The conclusion drawn here is that OCs can be converted into MOOCs only if they acquire some massiveness, material arranged in modules, interaction, assessment and Certification and make use of edX experience, a thing recommended in the current paper. Massiveness can be achieved with the use of some OCs to train teachers per major while material modularization can be

obtained by means of splitting up (paragraphing) already uploaded video-lectures on Open Delos platform which has multimedia material at its disposal and supports OCs (Open Delos,2017). It is more feasible to achieve interactiveness via OLCs when trainees have some features in common (as in teacher training per major) while peer assessment in such a form of training comes face to face with the inherent drawbacks of this method as they were stated above.

Suggestions: Converting OCs into MOOCs

The conditions for their conversion are as follows:

1) Massiveness: SE teachers' training addresses big numbers of teachers. To have massive OCs, teachers of each major should be divided into subgroups per area. We encounter such a good practice in Moodle, a uniform program split up into subgroups of 20-22 members in big cities in Greece, implemented by an informal teacher network created in 2007. As Liakopoulou (2011) states, the organization of this seminar has a great number of innovative features: voluntary participation and flexibility in space and time individualization and adaption to the needs of each trainee via the method of action and the possibility of selecting 70% of the teaching material available pedagogical use of potential errors through the option of re-submitting exercises and providing feedback according to the trainees' needs direct feedback and systematic support among members via online chat groups with more than 1000 emails per year and other tools of online communication members' and trainees' participation in the decisions taken as for the teaching material, the improvement of the seminar etc., as well as use of trainees as multipliers, trainers and graders. Finally, training is open and provides the option to use the teaching material to other teachers as well, non-training ones, according to their needs (Liakopoulou, 2011, p.73-74). We note that it has the features of a cMOOC, while it has a lot in common with Mathesis, too. Moreover, to provide help and guide to students, it utilizes TA (Teaching Assistants)to direct the traffic of discussion posts inside the forums, providing feedback, guidance, and support(Sharif &Magrill,2015), a feature seen in MOOC as well.

2) Modularized material: It is difficult to achieve a fully student – centered approach. We can, nevertheless, modularize the already existing material. The long video-taped lectures that have been uploaded on Open Delos platform, can be split up into shorter videos directly corresponding with the respective modularized material, through gradually posting units. In this way, we manage to modularize the material, a prerequisite for every distance-learning program. The printed material can be enriched with recorded lectures or material from "Kallipos".

3) Interaction: The OLC pattern should be utilized, in the way it is implemented in Mathesis. To achieve this, a collaborative mentality must be cultivated which will promote learning through various small groups (of 20 members each). To do this, we should create introductory experimental programs where the first trainees will constitute the program's multipliers. Again, we see Moodle acting in this direction, where some trainees of each stage of training constitute the

trainers of the next one towards a subgroup of trainees. Furthermore, those trainers are divided into heads, trainers and graders or only graders. These organizational stages can be utilized as a whole in a training program with the afore-mentioned features.

4) Assessment: The use of graders can lead to the enrichment of assessment beyond the standardized (graded by computer) answers. The option to repeat exercises wrongly answered and the assistance provided via feedback by graders to each answer correct or wrong, give the recommended program a more collaborative dimension and simultaneously moderate any feelings of isolation potentially felt by a lot of trainees. The recommended grading can be regarded as a version of assessment by means of peers analyzed above. Our proposal uses teachers of the same major but they cannot be literally viewed as peers because their introductory experimental training has preceded the program, while at the same time there is not the disadvantage of assessing peers.

5) Certification: As we noted when speaking about Greek MOOCs' features, Mathesis certification is granted when 50% of the exercises has been done. The certification in a program that also includes assessment by trainers and graders, in the form described above, obviously invests it with greater reliability. On the other hand, we must take into consideration the fact that an organized training for SE teachers should offer a bonus - giving certificate as a motive.

The program elaborated above resembles more to a SPOC. Small Private Online Courses (SPOCs) use the same infrastructure as MOOCs but the access is only limited to some tens or hundreds of trainees. In this way, there is a drastic decrease in teaching and assessing students of widely diverse backgrounds.

A SPOC program includes a selection procedure for applicants and offers a more adapted experience (Coughlan, 2013). We see that SPOCs promote the connectivist dimension more than the behaviourist one and in this light we hold that they are more appropriate, always in combination with Moodle good practices, for the following reasons:

- Small scale. Up to 20 teachers can attend per program.
- Trainers must be registered and conditions should be kept, according to course and learning aims **(training per major)**.
- All lessons are carried out online, usually asynchronously, but without face-to-face Meetings **(distance – learning program)**
- All SPOC courses have teachers who provide feedback as far as content is regarded **(multipliers, TAs)**
- All courses have a well-trained online coordinator who guides students through lessons and acts as a first source for students.
- Online coordinators stimulate students to actively participate in lessons, which constitute a condition for the completion of the program (Uijl., Filius& Ten Cate,2017).

Moreover, certificates are granted, providing an incentive for teachers to attend. Finally, they remove the disadvantage (as cited in Pappano, 2012) of having too

wide a diversity among students participating in MOOCs, which leads to a lack of a common database and educational background among them.

Limitations and Directions for Future Research

In the research conducted there have been some restrictions that can prevent us from generalizing as far as our conclusions are concerned. By attending only some and not all of Mathesis and Coursity courses (since that could not be done) we may not have covered all of the features of the corresponding system, although we believe that what we attended is representative of each platform's courses. Moreover, the platforms' continuous enrichment with new courses as well as the Open Courses' corresponding development mostly from a technological point of view, may lead us to new updated research in the future where we will constantly be examining new parameters, too. These parameters mainly concern platforms' technological development but also their enrichment with connectivist features. Besides, future research could be conducted on teachers training in Mathesis and Coursity corresponding courses, with the aim to utilizing experience gained to transform OCs in the manner described above.

Conclusions

MOOCs provided by Greek Universities are still at an initial phase because of the reasons elaborated above. Reservations expressed and the important issue of such programs' cost can be overcome in the ways analyzed above in our paper. Research has shown that such a thing is more than feasible and it is worth the try. The way has been paved by University OCs already existing in tandem with preliminary work done so far.

Greek MOOCs' good practices could be transferred to OCs and the latter, under some conditions of course, could be converted into MOOCs (xMOOCs, to be precise, with a lot of collaborative features). These MOOCs can be used as SE Teacher Training Programs granting Formal Certificates as an incentive for teachers to attend and for the percentage of participants dropping out to be reduced. The most utilizable model is that of SPOCs due to the smaller numbers of participants and the homogenization they achieve. This homogenization is achievable because trainees are teachers while at the same time it copes with a great deal of the most significant MOOC disadvantages.

With our proposal, well-established attitudes among teachers may somehow be altered towards a more student-centered approach (on account of the collaborative characteristics), while at the same time, Universities themselves will profit from using OCs as a forceps of change in their traditional courses as well.

Finally, Universities will see their brand name improved, thereby obtaining multiple benefits from many points of view.

References

Avouris, N., Komis, V., & Garofalakis, J. (2015). Open courses in a Greek higher education institution: faculty views and attitudes. *Proceedings of 8th International Conference on Open and Distance Learning ICODL 2015*, Athens. doi: 10.12681/icodl.19.

Bates, T. (2014). *Comparing xMOOCs and cMOOCs: philosophy and practice", Online Learning and Distance Education Resources*. Retrieved from https://www.tonybates.ca/2014/10/13/comparing-xmoocs-and-cmoocs-philosophy-and-practice/.

Clow, D. (2013). MOOCs and the funnel of participation. *Paper presented at the LAK '13:3rd International Conference on Learning Analytics & Knowledge*, Leuven, Belgium. doi: 10.1145/2460296.2460332

Cormier, D. (2010). *What is MOOC?* [Web log message]. Retrieved from https://www.youtube.com/watch?v=eW3gMGqcZQc.

Coughlan, S. (2013). *Harvard plans to boldly go with SPOCS.* BBC News. Retrieved from http://www.bbc.co.uk/news/business-24166247.

Coursity. (2018). *About Coursity*. Retrieved from http://www.coursity.gr/about

Demetriades, S., Karayiannides, C., Pomportsis, A., & Tsiatsos, T. (2008). *Flexible Learning via Information and Communication Technology*. Thessaloniki, Tziolas Publications, Greece.

Dodson, B. (2013). *Will Georgia Tech's $7K online M.S. in computer science program make the grade?* Gizmag. Retrieved from http://newatlas.com/georgia-tech--graduate-computer-science-degree-mooc/28763/.

Downes, S. (2011). *"Open Educational Resources: A Definition."* Retrieved from http://halfanhour.blogspot.com/2011/07/open-educational-resources-definition.html.

Downes, S. (2013). *Assessment in MOOCs [Web log post].* Retrieved from http://halfanhour.blogspot.com.es/2013/05/assessment-in-moocs.html.

edX. (2018). *About us*. Retrieved from https://www.edx.org/about-us.

Guo, P. (2014). *How MOOC video production affects student engagement edX.* [Web log message]. Retrieved from http://blog.edx.org/how-mooc-video-production-affects.

Ionio University. (2017). *MOOC Interactive Multimedia.* Retrieved from http://www.ionio.gr/central/gr/news/7048/.

Kaloyiannakis, M., & Papadakis, S. (2014). MOOC (Massive Open Online Courses): a new challenge to modern online education. *Proceedings of the 8thPanhellenic ICT Teachers Conference,* Volos, 28-30 March 2014.

Kamidou, K., Spyrtou, A., & Kariotoglou, P. (2007). A constructive approach to the teaching of energy in Primary School: a pilot application. *Proceedings of 5thPanhellenic Symposium. Teaching of Natural Sciences and New Technologies in Education Issue 1.*

Karipidou, K. (2012). *University as a Vehicle of Lifelong Vocational Training: A Theoretical and Empirical Approach*. (PhD dissertation). Aristotelian University of Thessaloniki, Greece.

Kattmann, U., Duit, R., Gropengieber, H., & Komorek, M. (1997). Das Modell der didaktischen Rekonstruktion. Ein Rahmen fur naturwissenschaftsidaktische Forschung und Entwicklung [The model of educational reconstruction. *A model for science education research and development]. Zeitschrift fur Didaktik der Naturwissenschaften,* 3(3), 3-18.

Knowledge @ Wharton. (2012*). "MOOCs on the Move: How Coursera Is Disrupting the Traditional Classroom*" (text and video). University of Pennsylvania. Retrieved

from http://knowledge.wharton.upenn.edu/article/moocs-on-the-move-how-coursera-is-disrupting-the-traditional-classroom/

Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *The International Review of Research in Open and Distance Learning,* 9(3), 1-13. doi: 10.19173/irrodl.v9i3.523

Koustourakes, G., Liakopoulou, F., & Panayotakopoulos, C. (2015). Mass Open Online Courses (MOOCs) used by Greek Open University: Qualitative Research into the Institution' Professorial Staff. *International Conference on Open and Distance-Learning.*

Krause, S. D. (2013). MOOC response about "Listening to World Music". *College Composition and Communication,* 64(4), 689-695.

Liakopoulou, E. (2011). A network that makes use of Moodle collaborative learning platform for blended training. In: Bagakis, G. (ed.): *Already stipulated and new forms of training*. *Seeking after partnership and good practices,* OEPEK.

Mathesis. (2018). *The entity*. Retrieved from http://mathesis.cup.gr/foreas.

McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). *The MOOC model for digital practice.* University of Prince Edward Island. Retrieved from https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/MOOC_Final.pdf

Meheut, M. (2005). Teaching-Learning Sequences Tools for Learning and/or Research. In: K. Boersma, M.Goedhart, O. De Jong, H., Eijkelhof (Eds.), *Research and the Quality of Science Education,* Springer, The Netherlands, 195-207. doi : 10.1007/1-4020-3673-6_16

National and Kapodistrian University of Athens. (2018). *About E-Learning of the National and Kapodistrian University of Athens*. Retrieved from https://elearn.elke.uoa.gr/sxetika.html.

Open Courses. (2015). *Open Courses*. Retrieved from http://project.opencourses.gr/.

Open Delos. (2017). *The action Open Delos*. Retrieved from http://project.opencourses.gr/%CE%B7%CE%B4%CF%81%CE%AC%CF%83%CE%B7/open-delos/.

Pagge, A. (2012). *Online e-learning Programs, designing and potentiality to use in Greece: the case of semasiological internet*. (Unpublished Doctoral Thesis). Greece.

Pappano, L. (2012, November 2). The year of the MOOC. *The New York Times.* Retrieved from http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html.

Peters, M. (2008). *Openness' and 'Open Education' in the Global Digital Economy: An Emerging Paradigm of Social Production.* Seminar Series on 'Education and the Knowledge Economy'. University of Bath, United Kingdom. Retrieved from http://eepat.net/doku.php?id=openess_and_open_education.

Polytechnic of Crete. (2014). *Online lesson from ALBA: "Entrepreneurship Beyond Silicon Valley: The Greek Story".* Retrieved from https://www.tuc.gr/index.php?id=1893&tx_ttnews%5Btt_news%5D=5952&cHash=d220310d390fe27f32c1016088eedf41.

Salmatzides, G. (2016). *MOOCs: Academic Staff's Tendencies on Online Knowledge*. Retrieved from http://opencourses-project.auth.gr.

Sandra, G., & Sergio, M. (2014). Moocs gone wild. *Proceedings of the 8th International Technology, Education and Development Conference (INTED 2014*) (pp. 1449-1458). Valencia, Spain.

Sharif, A., & Magrill ,B. (2015). Discussion Forums in MOOCs. *International Journal of Learning, Teaching and Educational Research,* 12 (1), 119-132.

Siemens, G. (2013). Massive Open Online Courses: Innovation in Education? In R. Mc Greal, W., Kinuthia, & S., Marshall (Eds.) (2013). *Open Educational Resources: innovation, research and practice* (pp. 5-16). Vancouver: Commonwealth of Learning. Retrieved from https://oerknowledgecloud.org/content/massive-open-online-courses-innovation-education.

Sonwalkar, N. (2013). Why the MOOCs Forum Now? *MOOCs FORUM,* 1(1). doi: 10.1089/mooc.2013.0005

Sophos, A., Kostas, A., & Paraschou, B. (2015). *Online Distance - Learning Education, from Theory to Practice*. SEAB. Athens.

Spyropoulou, N., Pierrakeas, C., & Kameas, A. (2014). Creating MOOC Guidelines based on best practices. *6th annual International Conference on Education and New Learning Technologies. Barcelona, Spain*.

Tsiatsios, Th.-K. (2015). *Educational Internet Environments*. SEAB.

Tsoni, R., Geka, P., Siolou, E., Sipsas, A., & Pagge, T. (2013). The Role of the Teacher in MOOCs. *International Conference on Open and Distance-Learning Education.* Tianjin, China.

UDEMY (2015). *Interactive Multimedia*. Retrieved from https://www.udemy.com/interactive-multimedia-in-greek/.

Uijl, S., Filius, R., & Ten-Cate, O. (2017). Student Interaction in Small Private Online Courses. *Medical Science Educator* , 27 (2), 237-242. doi: 10.1007/s40670-017-0380-x

Yousef, A. M. F., Chatti, M. A., Schroeder, U., Wosnitza, M., & Jakobs, H. (2014). MOOCs a Review of the State-of-the-Art. *CSEDU 2014 – Proceedings of the 6th International Conference on Computer Supported Education* (pp. 9-20). Barcelona, Spain. doi :10.5220/0004791400090020

Yuan, L., & Powell, S. (2013). *MOOCs and Open Education: Implications for Higher Education.* Glasgow: JISC CETIS. Retrieved on January 12, 2018 from: http://publications.cetis.org.uk/2013/667.