

# Patterns of use of open courseware in a Greek University: the eclass.upatras.gr case

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## Abstract

Academic year 2015-2016 has been the first one in which the University of Patras, made publicly available a large number of open courses, developed during 2012-2015. This courseware concerns 350 courses of many different disciplines that were published under creative commons license, through the University of Patras learning content management system (eclass.upatras.gr). This same platform also delivers course material to students of the University. During this first period of publication of the open courses, some patterns of their use emerged. These are presented and discussed in this paper. Wider implications of the development and deployment of open courseware by Greek universities are discussed in the final part of the paper.

**Keywords:** open courses, learning content management system, learning technologies in education, MOOCs

## Introduction

Universities around the world are in search of new strategies in relation to open courses and development of open courseware, as the role of higher education is re-defined at a global scale. Allen and Seaman (2014), in their survey of online education in the US, claim that over 70% of Universities reported online education as critical to their long-term strategy. However, Europe seems to have had a slow start in this field, compared to the US, judging by the success of Coursera, EdX and Udacity and other mostly US-based initiatives. European universities are in search of their role in relation to this new challenge, as they observe that they are falling behind their US counterparts. In the Porto Declaration on European Massive Online Open Courses (MOOCs) (2015), that was issued by many leading European universities, they call upon European higher education institutions to embrace the possibilities that the open and online education movement offers through the Knowledge Society and stress the need for stronger collaboration in Europe, based in the “principles of transparent cooperation, mutual benefit and collective incremental advantage”. A recent study in the context of EU-funded project HOME (Higher education Online: MOOCs the European way), claimed, that 71.7 percent of a sampling of European universities are developing or have developed MOOCs (Jansen & Schuwer, 2015), while Schuwer et al. (2015) recognize the opportunities and the threats for European universities in relation to the open courses: opportunities identified include the ECTS as a robust system for formal recognition of accomplishments in open online courses, the trend for institutional collaboration, stimulated by EU-funded programs, and the many innovative and alternative pedagogical models used in online courses published in Europe, while the same paper claims that threats include implementation problems of the ECTS, difficulties in bridging non/informal and formal education, and too much regulation, hindering experimentation and innovation, in addition to inherent difficulties related to linguistically segmented

continent. The situation has been further aggravated by the current economic crisis that has reduced public funding in mostly-public European universities. Despite this background, at the national and European level, there have been initiatives to develop open courses. The Greek 'Open Academic Courses' project that was funded by structural EU funds in the period 2012-2015, has supported development of over 2000 open courses in most Greek universities. The University of Patras was a leading institution in this project. Over 350 open online courses have been developed and published gradually until September of 2015 (Avouris et al. 2015a, Avouris et al. 2015b) by the faculty members. So academic year 2015-2016 has been the first year in which these courses have been made available to a wider audience. A research question is to monitor the use of this courseware in order to shape institutional policies on open courses. In this paper the first findings of usage data relating to open courses of the University are presented and their patterns of use are compared to those of existing online learning content.

### Context of the study: the University online learning resources

The University of Patras, a medium size public university (25,000 students, 24 academic departments, disciplines spanning medicine, technology, sciences, humanities and social sciences) has adopted for the last 10 years the opensource learning content management system openeclass (<http://www.openeclass.org>). This is a learning management system developed by the Greek University Network Gunet, widely used by Greek universities. The University of Patras installation [eclass.upatras.gr](http://eclass.upatras.gr) (Figure 1) has been monitored using Google analytics ([analytics.google.com](http://analytics.google.com)). The trend of usage of the platform is discussed in this section.



Figure 1. Upatras eclass platform (left) in 2006 and (right) in 2016

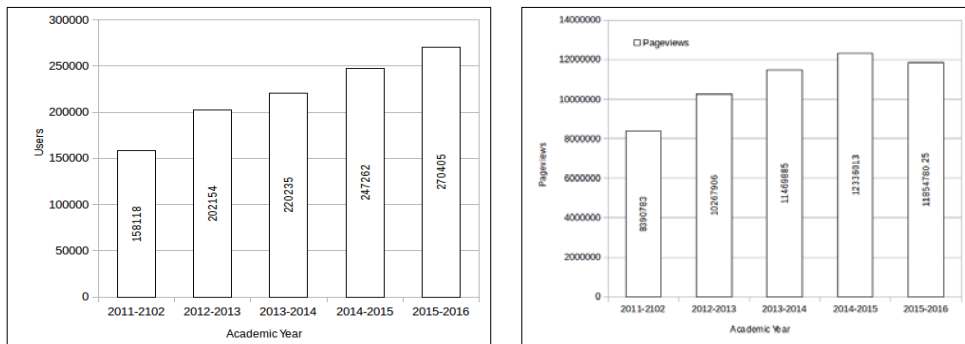
Looking in the history of the platform, in terms of number of courses, the eclass platform in 2007 contained just 433 courses, in 2009 contained 740 courses and today over 5000 courses (data from [archive.org/web](http://archive.org/web)). Looking into the data of usage of the platform during the last five academic years, the trend is shown in Table 1.

Table 1. Usage data (google analytics) for the period 2011 to 2016

Academic Year	% New Sessions	Avg. Session Duration	Bounce Rate	Pages/Session	Pageviews	Sessions	Users
2011-2012	16.82%	00:05	9.81%	9.51	8390783	882506	158118
2012-2013	15.81%	00:04	11.02%	8.87	10267906	1157375	202154
2013-2014	14.48%	00:05	11.63%	8.36	11469885	1372440	220235
2014-2015	14.06%	00:04	13.28%	7.85	12336013	1570925	247262
2015-2016	15.92%	00:05	15.17%	7.87	11854780	1507176	270405

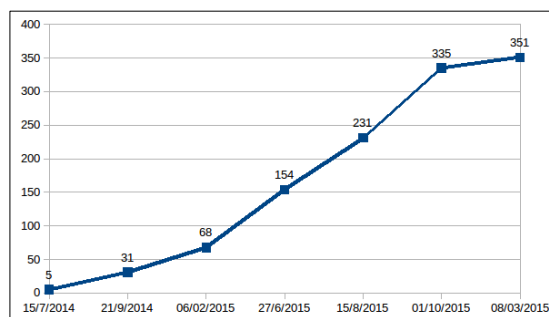
One should note that the student population of the University and the number of courses delivered is stable during this period, while the eclass courses steadily increases. At the same time the number of users of the platform observed a steady annual increase of 14% in average and overall increase during the period of 71%. On the other hand, the number of pageviews (total number of visits to pages of the web site) are also in increase, with the exception of the last year (overall increase 2011 to 2016 is of 41%), see Figure 2.

For each year the data are based on the usage from October to April. For 2016 interpolation of two months missing data was performed based on average values.



**Figure 2.** Number of users (left) and page views (right) per academic year between 2011 – 2016 (data from google analytics for eclass.upatras.gr)

This steady increase in use of the platform is thought to be partly a side effect of the involvement of many faculty members of open courseware during the same period, using the eclass as publishing platform, as discussed in Avouris et al. (2015b). The rate of introduction of open courses in eclass is shown in the following graph (Figure 3). From this, it is evident that most of the developed courses were available at the beginning of the academic year 2015-2016.



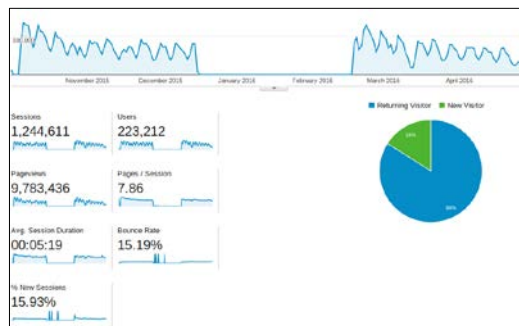
**Figure 3.** The evolution of published open courses in eclass.upatras.gr

In the following section, we focus in more detail, in user behaviour of the eclass.upatras.gr platform for the academic year 2015-2016, in particular with reference to the usage of the open courses.

## Eclass user behaviour

In April 2016, eclass.upatras.gr platform contained 5050 courses. From them, according to google.analytics, 2426 have been active courses that received more than 5 visits beyond their home page. So more than 50% of the eclass courses are not in use. Of the active courses, 348 (14% of the total) are courses developed within the Open Academic Courses initiative, and the rest (2078) are the normal online courses that are destined to the university students supporting a blended learning approach (learning in class and through the online course material). In this section we produce patterns of use of these two groups of courses, as they emerge from usage data from the periods October to December 2015 and February to April 2016, corresponding to the winter and spring semesters of the Academic Year 2015-2016. The period is representative of the academic year as it includes the core semester time, for both academic semesters, excluding however exams time.

In Figure 4 an overview of user behaviour during this period is shown.



**Figure 4. Overview of monitored period user behavior**

In order to analyze the presented here data, one should be familiar to the learning modules and structural elements that an eclass course may contain.

These can be identified as:

- Content delivery modules (course\_description, documents, glossary, video, ebook, links, agenda, blog)
- Evaluation modules (work, exercises, questionnaire)
- Communication and web 2.0 modules (announcements, dropbox, forum, wiki, conference)
- Course structuring modules (units, weeks, learnPath, group)
- Course administration modules (course\_info, user, course\_tools, usage, gradebook, attendance, course\_metadata).

From the above modules, the first four are modules to be used by the students while the last one refers to teacher tools.

It should be mentioned that many options are relatively new, as the option of structuring the course in units, weeks or introduction of e-learning paths, while many new web 2.0 modules have been recently introduced (blog, chat, wiki etc.).

An observation is that the platform has been mainly used until now, as a tool for content delivery, e.g. for distributing handouts and lecture slides and for collecting assignments and evaluating students, while the video and other multimedia content have been used so far in a limited way.

The open courses diverted from this model. While they were based on the content of

existing courses of programmes of study, however they were designed more as self-paced learning courses for a wider audience, so the material was more structured and often video and other multi-media have been included, together with self-evaluation exercises. So it is interesting to observe how the usage behaviour reflected this new courses' design.

In the following, we present the user behavioural patterns of the courses. Google analytics monitor pageviews, that is every time a user visits a specific page. So for instance it counts in the given period of time how many times users visited a specific page, e.g. /modules/announcements/?course=ECON1323, this is translated as number of visits to the announcements page of course ECON1323.

For each course, we normalized the distribution of pageviews in different modules by dividing them by the total number of pageviews of the course, in order to eliminate the size of the course students. In average the percent of pageviews per category of modules for all 2426 active courses is shown in Figure 5.

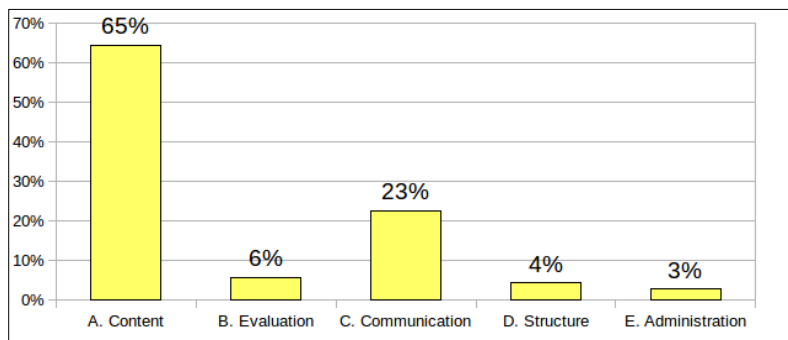


Figure 5. Average distribution of user activity in course modules

One can observe that most pageviews are related to delivery of content (65%), 23% related to communication and web 2.0 modules, 6% evaluation modules, 4% structural elements and 3% course administration.

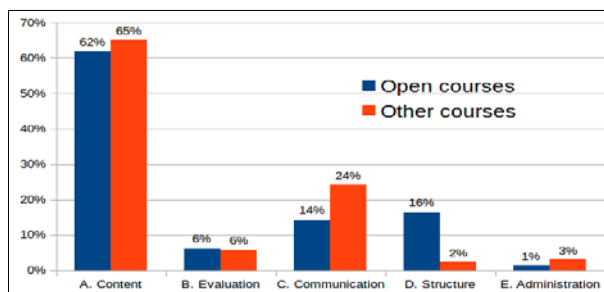


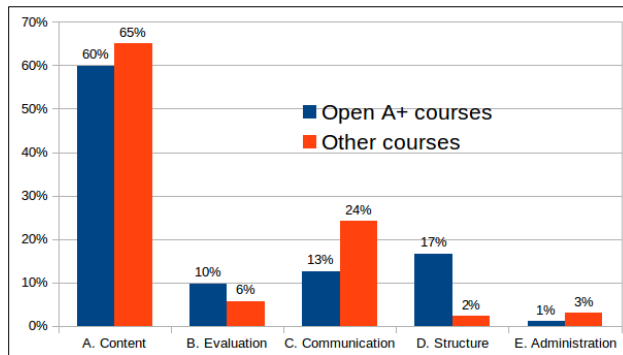
Figure 6. Comparison of User activity between open courses and other courses

An interesting question is whether there are significant differences between the open courses and the normal courses. We performed the same analysis in the two groups and discovered that the communication modules have been used less in the open courses (14% in average against 24% in normal courses), while the most significant difference is in the

structural elements of the courses. The open courses users' page visits concerned structural modules 16% against 2% in the normal courses, see Figure 6.

When we focus further on the open courses that contain video lectures, the pattern does not change significantly, these courses had 60% user activity in content modules, 10% in evaluation modules, 13% in communication modules and 17% in structural elements, as shown in Figure 7.

This user behaviour indicates that the open courses were considered by their users as structured courses, for which activity was balanced, between course units (structural elements), content and evaluation and communication activities. This applied to both the open courses with video lectures and those without multimedia content.



**Figure 7. Comparing of user activity between open courses with video lectures (Open A+ courses) and other courses**

### Comparing open courses student behaviour to normal courses

In this section, we attempt a comparison of students of open courses behaviour to that of normal courses of eclass.

First in relation to access to course content, in open courses students accessed *documents* most (86%), followed by *course description* (8%) and *video* (4%), the last changed to 15% for the A+ open courses. We should commend here that multimedia content resides in a different server, so its access is not fully monitored. In comparison, for normal courses the main resources were *documents* (88%) followed by the *agenda* (4%) and *course description* (4%). We should observe therefor that the patterns are very similar in the two groups of courses.

In relation to evaluation, the open courses students used mostly the self-evaluation *exercises* (62%) followed by homework submission module *work* (35%) and *questionnaires* (3%), this is quite different pattern than the normal courses where homework submission *work* accounts for 49% of the visits, *exercises* for 48% and *questionnaires* for 3%. Here there is a significant difference between the two groups of courses, since the open courses contain much more self-evaluation material compared to normal courses, therefore this usage pattern emerged.

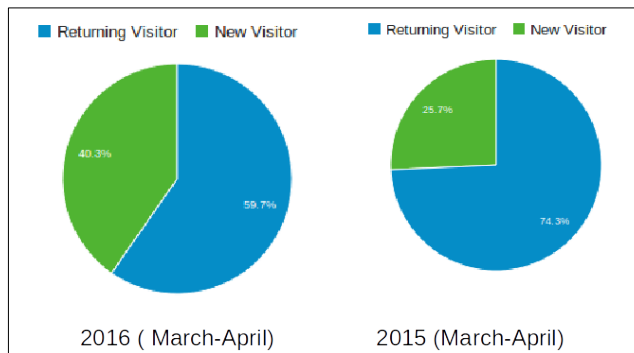
For communication in both groups *announcements* were used most (94% in normal courses and 98% in open courses), while web 2.0 modules have found no use in either group of the courses (*wiki, forum, chat, etc.*)

Finally, in terms of course structuring, open courses used *course-units* (96%) and *student groups* (4%), while in the normal courses the *student groups* were used more extensively

(71%) the *course-units* were used 25% while the rest was divided between *learning paths* (2%) and *weekly structure* of the course (1%). It should be mentioned that *unit structure* was the recommended way of organizing the open courses and thus it has been used extensively in them, while its use is not as extensive in the normal courses. On the other hand, in normal courses, the platform is used often for forming student groups, in order to assign them project and other student work, something not used in open courses, where students projects are not common.

### Audience profile

A final study concerns the profile of visitors in the eclass platform. We compared the profiles of visitors of the same period (March -April) between 2016 and the year before. We focussed in a particular group, that is, to visitors not residing in Greece. These are most probably visitors who are attracted by the open courses. It was observed that this group has increased from 2223 to 3191, an increase of 44%, much higher than the increase of overall user population. In addition, the number of new visitors in this group has increased from 26% to 40%, see Figure 8.



**Figure 8. Profile of non-Greece-based visitors**

It should be mentioned that the courses language is Greek, so they cannot attract a wider international audience. The users coming from other countries than Greece are just 1.3% of the overall user population, presumably Greek speaking students living abroad. Despite this fact, it seems from the presented data, that an increased number of visitors has been attracted by the open courses during academic year 2015-2016.

In addition, we should note that in the table of referral traffic to the portal, for 2016 the 9<sup>th</sup> referral site is the open courses national portal (opencourses.gr) that is responsible for 3.5% of incoming traffic, this does not appear in the table of referral traffic for 2015. Most of other referral sites are local university sites, social media, search engine traffic and direct traffic with no other significant difference between the two years 2015 and 2016.

### Conclusions

In this paper, usage data of open courses by a major Greek University, have been presented and analysed. They concern the first academic year of their publication. It is evident that these courses are still in search of an audience. Some of the findings of this study are the following: (a) the open courses attracted the interest of rather local community and in a

small degree some international audience. Most traffic seems to be coming from within the university students' audience. It should be mentioned that the open courses have been among the busiest of the eclass platform. Among the top courses that attracted more than 10K pageviews during 2015-2016 (74 courses), the 22 of them (30%) were open courses, (b) the patterns of interaction with the courses diverge from those of traditional courses of the university: clearly more structural elements of the courses have been used, more self-assessments modules and less direct interaction with students (announcements etc.), while in terms of content, new emerging media, like video take a more prominent role, without however replacing yet the dominant role of documents, (c) in terms of innovative approaches to communication and interaction, like use of web 2.0 approaches, we observed no significant differences between open courses and normal courses and (d) the Open Courses have contributed during their development period to increasing traffic and usage of the learning management content platform improving use of digital media and online learning approaches overall.

In terms of general strategy of the University towards development of open courses, there is no clear answer if the investment towards mass development of open courseware is worth the effort. Some of the original objectives have been achieved: more online learning content and increased interest in using digital media in teaching and learning is evident, however there is no indication that the developed courses increased the outreach of the university to a wider community. Faculty maintain a positive disposition as discussed in Avouris et al. (2015b). A close monitoring of the use of the developed courses and development of metrics by the Learning Technologies Center of the University will help us define more clearly the institutional strategy in the future.

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