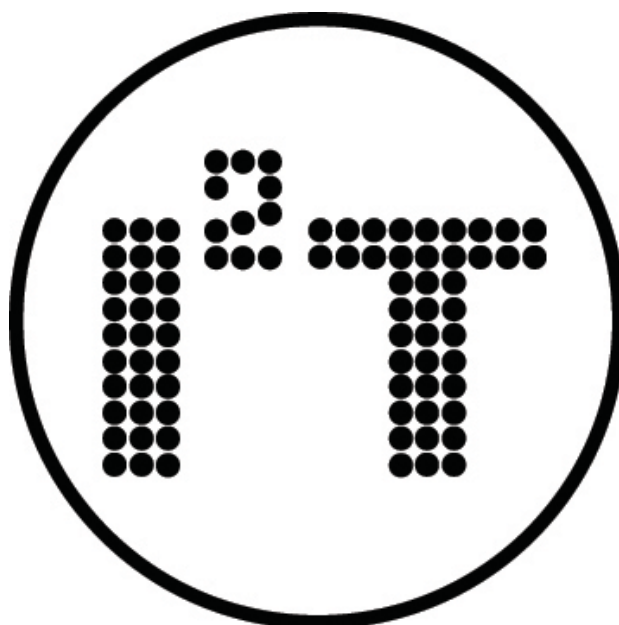


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TECHNOLOGIES»**



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IN EDUCATION**

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iPhone headset for voice recording, also possible use of lapel microphone with XLR-2-USB converter;

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IMPLEMENTATION OF MOOC METHODS TO UNIVERSITY CLASSROOM COURSES

Korolev, D., Pavolotsky, A.
MIEM NRU HSE

Electronic support of higher education is a popular trend in distance education, but classroom studies lack information support and therefore depreciate comparing to MOOC versions, having advantages in real-life workshops and possibility of personal contact with teacher and other students.

This paper describes educational experiment in convergence of educational models conducted at MIEM NRU HSE in 2013 and the factors that made it possible and allow for wide implementation in the universities.

Keywords: MOOC, blended learning, academic course, assessment, grading system, peer review

Introduction

Blended learning historically refers to using technical resources available in universities and rare or impossible at households for personal use, such as computers (in 1960-th), data communication broadband channels (till late 1990-th), specific peripherals. But most of the learning content is represented by lectures (notes and presentations), quizzes and classroom practices (workshops) followed by homeworks and do not require any specific equipment nowadays. Furthermore, using own computers in classrooms is a growing trend known as "BYOD" (Bring Your Own Device) (S. Emery Factors for Consideration when Developing a Bring Your Own Device (BYOD) Strategy in Higher Education // University of Oregon, Applied Information Management Program. July, 2012. <http://urlid.ru/bk4i>).

MOOCs are considered to be mostly lecture and quiz format oriented and thus believed to be a poor substitution to engineering and natural sciences courses, where workshops are essential. IT-related disciplines also lack infrastructure of university laboratories in some cases. But this common case meets few but growing number of courses with offline activities.

Most of the buzz around MOOCs concerns distance learning and two main

implementations -- "lifelong learning" and earning online more credits for offline university programs, that became possible recently but still now widely. These cases are widely discussed, but in this paper we refer to the methods and tools of MOOC implemented in classroom studies and the issues arising.

There are two scenarios of implementation of the electronic support for higher education, that were tested recently:

1. Use MOOC course as a part of a classroom course and, optionally, consider the results in course grades.
2. Use the idea of MOOCs and implement the methods of network-based learning as supplemental for ordinary classroom course to engage and facilitate students to an intensive learning and keep them in-touch instantly rather than once a week, as supposed by syllabus.

Blended learning features

Teaching large groups makes personal communication with students almost impossible: few minutes after lecture and a chance to get attention of the teacher on the workshop in case of a problem are not to count. Often teachers do not bother themselves to answer emails or answer formally. Comparing to modern MOOCs with their numerous organised societies and communication infrastructure, it will not be falsely to claim that ordinary student is more often left alone with his problems and misunderstandings in his campus, than an online user living in any place of the networked world.

To get most of the technologies we should first acknowledge the following:

- Services for the course should be presented clearly, work reliably and predictably. Blogs, e-mail, chats, file and online document hostings should be transparently usable, not a quest for the student.
- Relaying communication to online tools predictably results in growth of time spent on e-mails, blog posts, comments and chats. The problem is that this growth sometimes unpredictable and it is the teacher's responsibility to establish the "protocol" of communication. There are simple tools that help to reduce routine work with gathering submitted files and other tips, described in this paper.
- At least small automation skills are required. The teacher, or at least the assistant, should know the basics of data processing and representation in electronic spreadsheets. Network data collection reasonably implies almost real-time mode.
- University infrastructure, students and teacher should be technically and culturally ready to work in blended mode.
- Students' mutual communication is very important for educational process and teacher should push them to meet online on the forums and discuss arising question between each other first.

Involvement and interactivity

There should be enough **feedback activities** during the course to make it continuous in students' perception. University syllabus highly fragments student's time between a dozen of simultaneous and thus extrusive disciplines that results in very low efficiency from lecture format: every intention to digg the topic learned, or try something that was spoken about, born in student's head while one lecture, is extruded by the next lecture. Keeping students in touch between the classroom studies, that usually have weekly period, may be a challenge and here we have the first benefit from online supported course syllabus: essays, tests or any other activities may have deadlines between the classroom dates and this returns students to the topic.

Another involvement activity that also ranges the students very clearly, is taken from MOOC arsenal: it is **peer assessed essays**. This is a very delicate and powerful gear in educational mechanism and should be used carefully with all needful preparations. Peer assessed assignments consist of two phases: writing and assessment. It is very important to

give clear tasks to writers and benchmarks to peers. For this purpose it is better to split final mark to components having form and contents graded separately, highlighting desired properties in separate marks. The scale should not be just "poor to excellent", every level should have clear description so that the peers could refer and be responsible for their decisions.

Responsiveness of the teacher

The more distant is the teacher in educational process, the more important is the feel of responsiveness that a student has while studying. Well organized information support helps both the teacher and all the students to avoid writing personal e-mail correspondence to clarify common things like the terms or requirements for home tasks.

Anyway, the teacher should be involved to network communication, be of those modern people that do not make an effort to express their thoughts in text form using any of acceptable services.

The choice of services to use in the course is significant in getting things done well, not just formal. LMS, provided by the university is not always an appropriate tool and, in some cases, it would damage the whole idea being unstable and sluggish. If the university stands for quality of education, then the role of the teacher as the only person to be responsive for the course should also meet the idea that the others are the infrastructure to make teacher's work effective.

Implementation experience

New approach was implemented fall 2013 on "Computer Graphics" course: eight weeks, eight lectures, three workshops and one planned home work. This syllabus promised to make the course absolutely lightweight, leaving the majority of the audience uninvolved. At the same time the number of students grew from 30-40 to 122 and will grow to 190 next year, that leaves no chance for any individual work with students. No course project was planned and could not be done in such a short time.

Course organisation

The plan to get students involved and compete for their attention with other, more scary, courses was the following:

1. Flexible grading system gave the opportunity to choose whether to accomplish minimal set of required assignments and sum of marks could give high final mark, or do required assignments as they go, but pay more attention to creative and optional assignments such as essays, home tests and peer assessment.
2. All terms were set to binary status: same way as passenger taking a train has only two states (to "take the train" and to "be late"), all tasks had a deadline and no excuses were accepted. Deadlines were set to different dates, often other than lecture days.
3. The only face-to-face control, except the final testing, was applied on the workshops and had two goals: check the residual knowledge on the topic and prove the presence of the student in the classroom.
4. Home tests are optional and were open after the lecture till the next one to return the topic and have minimum weight in final score. There is no need to verify the authenticity of the answers, the main goal is to "check the pulse" and refresh student's memory.
5. Essays are creative works in this course and were optional. There are strict rules of proofing, academic writing and referencing and the assignment assumes a survey with analysis and systematization.
6. Peer assessment is also an optional activity, but assessment system forces students to do this job. Each student was assigned to grade three essays twice during the course.
7. Format of workshops was taken from previous years. Some examples are shown in the classroom and a more complicated task is assigned for homework, report is sent to the teacher. This format caused the most of bustle and does not fit well to mass teaching.

Same profile could be applied to hard working students, who have no time to deal with university tasks and have to save every possible minute and minimize the risks of failure.

In this case we do not count essays, but reduce negatives and convert them to positives: grading without writing is possible. The whole picture then is:

1. 3 Workshop tests = 8%
2. 3 Home works = 45%
3. 6 Peer gradings = 36%
4. Final test = 20%

Total score = 109%.

As we can see from the models above, all kinds of students have chances to earn maximum grade and their real grade depends on their efficiency inside the model they have chosen.

From real life experiment some disbalance was understood in scoring peer grading against essay writing: peers were overweighted, writers underweighted, this will be fixed next time.

It worth to notice that the only mark set by teacher remains homework assessment, all others are either automatic or peer-graded. Peer grading system is always a subject of discussion and has its weaknesses. Coursera CEO Daphne Koller statistically proved (Daphne Koller, TED Talks <http://urlid.ru/bk43>) correlation between peer grades by students and teachers assessment, but the case we are reviewing, is specific and quantitative estimation of activities, taken before the course started was nearly correct because of taking in consideration the psychology of students.

If it is stated that a task is optional, it goes contrary the typical school model that is repeated in Russian universities.

Another typical behaviour is the fear of negative marks. It is unusual for students that work done can explicitly subtract the score. This makes student consider essays as a tricky thing even before they look carefully the grading rules, and facilitates them to do peer grading. Before we refer to negative part of essay's mark, let's see the statistics of both essays and peer grading:

Table 1. Peer grades.

122 students	Essay 1	Essay 2
Topics	12	5
Received works	28	17
Accepted works	23	12
Involvement	19%	9%
Average mark	14,2	14,1
Minimum mark (Five works, rejected for plagiarism, are not counted here, their final mark is "-5")	9,2	11,5
Maximum mark	16,4	16,7

Table 2. Peers statistics.

122 students	Peer grading 1	Peer grading 2
Total	262	271
Accepted	249	264
Average per work	10,8	22

These tables show that number of peers significantly exceeds the number of writers and this allows statistic methods to be used and it reduces the limitations of the method.

Essays grading system

Assignments include measurable values and qualitative characteristics, that can be verified with no deep introspection to the topic and need no qualification above common sense.

There are two categories and two scales in each of them:

Contents:

- Completeness (1-6). This includes
- Validity (1-6)

Form:

- Exemplatiness (1-4)
- Page proofs (1-4)

Total score: up to 20, that, starting from "-5" gives maximum 14% to total grade. Negative "bottom" is used to limit those students, who would send incomplete works to ears at least something, loading peers' time and attention. Also, this is a good warning to plagiarists, their works are graded with minimum marks. This measure is a kind of denoise filter and policy wanting to keep number of peers exceeding the number of writers.

Those students, who were scared of negative marks for their honest attempts should have paid attention to minimal values in grading system: there is no chance to get less than "4", that results in "-1%" in final scale, and this could possibly be an empty document.

Peer grading issues

Peer grading is often a subject to criticise for giving unqualified people the right to judge. But soon we will see the limits of this method implementation and reasons why it remains reliable in this case.

1. Peers have strict guidelines: the table with description of every mark in all categories. There are no "poor-excellent" labels, every cell is a description like "Sufficient references (>10, >2 foreign, but sources are not authoritative, <25% are scientific articles or books".
2. Peers are controlled by the teacher. Teacher does not grade the essays, but his expert evaluation is needed to judge uncertain cases, that are detected statistically.
3. The number of works accepted is limited by a reasonable floor. Some measures are taken to limit junk flow and reject plagiarists. It is important that total number of works could be theoretically possible to check by the teacher or assistants using the guidelines for peers.

Here we can see why this method cannot be directly used in real MOOCs and why, at the same time, it is safe for limited, though numerous groups of students in universities. It is not fully automated in cases, when peer grades are not consentient.

How to detect faulty grades among hundreds? Every peer submission is represented by a string in a table, where we find just 4 digits and optional comments. Also, peers are asked to fill formal statistics about the work assessed, e. g. number of references and other numeric measurements to check if they have at least opened the file.

For every given work average mark from all peer grades is counted and each grade is compared. Deviation is recorded to a table for every peer assessment and highest deviations are taken to manual check.

All essays, that were assessed with high deviation among the peers, are assessed by teacher and all marks are compared to teacher's with a definite threshold of confidence interval, which was ± 1 for each of four marks. E.g. in the scale 1-6 or 1-4 and teacher's mark "3", marks 2, 3 and 4 would be accepted. If at least 50% of marks are accepted, peer submission is accepted and rated (+6%), otherwise it is rejected (-3%). It means that successful peer grades should have at least 2 of 4 marks in confidence interval, based on expert opinion.

Thus, amount of essays for teacher's assessment depends on deviation of peer grades and not on the initial quantity of submitted works.

Tools

The course was completely based on public services and was absolutely open. The following tools were used:

1. Google Blogger to provide a course site (<http://cg-2013.blogspot.ru/>)
2. Google Forms for tests and submissions
3. Google Spreadsheets for data collection, processing and representation
4. Google Disk and SlideShare to place course materials to be linked to the site.

In-group communication was not fine with Google Groups and mailing lists, students prefer social networks, specifically VKontakte. Next time this course will be based on Blogger+VKontakte groups/chats for better information support.

Conclusion

1. The main goal to separate teaching and assessment is achieved.
2. Exit questionnaire has shown that almost all students were happy with the style and tools of information support for this course, found them informative, comfortable and user-oriented comparing with university's LMS.
3. At the same time, grading system caused some confusion among a part of students, mostly from "bummers" group: they missed the point that ignoring peer job results in reduction of final score. Next time this should be presented more clear in introduction.
4. Public services are quite helpful and much more flexible and reliable than locally provided by university. Anyway, to automate processing completely some scripting is required.
5. Lack of public peer review/grading tools results in complexity of manual implementation. This time authors' names were open, normally they should be hidden.
6. Though all slides and full text were published before every lecture, full information support is better represented by MOOCs and will be delivered in the same volume: video lectures, supplementary links and reading, forum/group conversations. Also an electronic printable book and instant communication with the teacher will be provided.
7. There could be many unhappy students after rejections of submitted works. But after detailed explanations proved by links and digits their dissatisfaction turned to loyalty -- they claimed, that it was the first time they got a clear explanation of grading.

Future work

First iteration was relatively successful, but took too much time on monkey job with data processing.

Next time peer module should be automated and classroom lectures and workshops doubled with MOOC platform based video-lectures (Udemy) and printable book based on full-text lecture files.

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