Behind the Scenes with MOOCs: Berklee College of Music's Experience Developing, Running, and Evaluating Courses…

Article *in* The Journal of Continuing Higher Education · January 2013

2 authors, including:

Alexis Perrier
Docent Health

7 PUBLICATIONS **12** CITATIONS

Some of the authors of this publication are also working on these related projects:

Project Modal analysis of a Korean bell View project

Behind the Scenes with MOOCs:
Berklee College of Music's Experience Developing, Running, and Evaluating Courses through Coursera

Carin Nuernberg
Alex Perrier
BERKLEE COLLEGE OF MUSIC

On September 19, 2012, Coursera announced a new wave of university partners, including the first music institution of higher learning, Berklee College of Music. Key in Berklee's decision to join Coursera was the opportunity to provide free access to high quality music instruction. In addition, it would provide the means to learn from this disruptive offering in the online learning space and enable the college to be part of a larger community of innovative educators and institutions.

Berklee launched four courses on Coursera in spring 2013, the first two of which, *Songwriting* and *Introduction to Music Production*, began March 1. The development effort fell under the college's online continuing education division, Berklee Online. The five and a half months between the announcement and the launch of the first courses were an adrenaline-fueled sprint to learn the evolving Coursera platform and prepare the video lectures and supporting materials for an audience that was growing by the thousands each week. What follows is a case study of Berklee's experience

developing, implementing, and evaluating its first massive open online courses (MOOCs).

ADDIE MINUS THE "AD–"

Berklee College of Music has more than a decade of experience with online music education, and since fall 2002 offers over 130 courses and certificate programs in music-related studies, with online bachelor's degrees in music business and music production to be offered in fall 2014.

Berklee Online places a heavy emphasis on quality. For an unprecedented eight years in a row, from 2004-2012, UPCEA awarded Berklee the distinguished or meritorious distance learning college course award. The course development team comprises instructional designers (course developers), a video producer, an interaction developer, a copy editor, a graphic designer, and student employees trained in multimedia production. Each faculty member authoring a course is assigned a dedicated course developer who pulls in other members of the team as needed during the project. The team traditionally follows the ADDIE (Analysis, Design, Development, Implementation, Evaluation) instructional design model, and courses take 10 to 12 months to develop.

Due to the short time frame for developing the Coursera courses, the team needed to abbreviate the process, focusing the bulk of the effort on the "–DIE." We made a number of assumptions about the kinds of courses, their length, and choice of faculty. It made sense to choose areas of the catalogue that were popular with Berklee Online's existing students. It also made sense to work with faculty who were experienced course authors, familiar with our process, and with a strong presence in front of the camera. Lastly, it made sense to develop courses that did not duplicate content in our existing courses, many of which begin at an intermediate level. Instead, the courses would be largely introductory, open to someone new to the subject matter, and would be half the length. The faculty members were charged with developing topical outlines for the courses in advance of the video shoots, and these outlines served as the list of segments to shoot.

THE VIDEO IS THE MESSAGE

Because video is such a focal point of the MOOC experience, the video producer decided on three-camera shoots in Berklee Online's dedicated studio space. Three cameras would enable focus on the most important elements being discussed. In addition, simple backdrops were used so that

students' concentration would be on the teacher and not on any distracting elements in the background (e.g., books on a bookshelf). During editing, the video producer opted for quick cuts between shots to keep the pacing swift and the overall feel intimate, as if the professor were speaking directly to an individual student.

In a typical Berklee Online course project, the course developer's involvement is the heaviest, with the video producer playing a secondary role. The model was flipped for MOOCs. While the faculty member and course developer reviewed footage and provided annotations with corresponding time codes, the video producer set about crafting the experience. The video producer spent more than double the time originally estimated for post-production in order to create and incorporate rich visuals that supported and enhanced what the professor was describing or demonstrating. The rationale for this was that if the content was not in the video, students might miss it.

Meanwhile the course developer worked with the faculty member to develop announcements, quiz questions, assignments, peer evaluation rubrics, and other supporting content. Because we were launching the MOOCs two at a time, course developers paired up to learn and help each other with the Coursera platform, which included building a consistent navigational scheme and organizing the forums for the courses.

Also during this time, a separate effort was underway to prepare Coursera students for the experience and build awareness for Berklee Online's curriculum. Enrolled students received free handbooks with preparatory material they could review in advance of the course start, and they were given access to a number of video interviews featuring the professor with whom they would be studying and other Berklee Online faculty.

A NOTE ON DESIGN

From a design perspective, the courses both used standalone quizzes and peer-review assignments to assess student performance. Because the *Songwriting* video lectures tended to be longer, they included in-video quiz questions to engage the student and reinforce the material being covered.

The peer-review assignments in the two courses were quite different. In *Songwriting,* Professor Pat Pattison presented new tools each week to help students write effective songs. Students would then apply these tools in a writing exercise, such as drafting the first verse and chorus of a song. By the end of the course, students were writing full songs set to music. In the peer

review, evaluators were asked to rate how effectively a given assignment demonstrated the use of the tools, and the review included quantitative and qualitative measures.

In contrast, assignments in *Introduction to Music Production* asked students to demonstrate a concept or technique covered in the lesson through a video presentation, audio recording, or a combination of text and graphics. Professor Loudon Stearns felt strongly that it would be challenging for students to learn music production concepts and immediately create music that applied them, and that the best way to cement students' understanding of a topic would be to teach it to others. Students provided self-assessments of their assignments, and evaluators rated submissions based on a consistent set of criteria week to week.

Another difference worth mentioning was the forum organization. In *Songwriting,* the forums were focused around key components of the course, for example, forums created for video lectures, assignments, technical feedback, etc. In *Music Production*, the forums were organized by lesson and then by content areas, so that each video segment had a corresponding sub-forum where students would have discussions specific to that topic.

RUNNING THE COURSES

By March 1, *Songwriting* had registered about 65,000 students and *Introduction to Music Production*, 55,000. Each course included a demographic survey that students were encouraged to complete when the course opened. The results of the survey showed that roughly two-thirds of respondents fell between the ages of 18 and 34; most were male (64 percent in *Songwriting* and 85 percent in *Music Production*—percentages consistent with similar subject areas in Berklee Online courses); and about half were native speakers of English. Major countries represented outside of the United States included Canada, Spain, India, Brazil, Mexico, Australia, Greece, the United Kingdom, and Germany.

In both courses, about two-thirds of respondents were not currently a student at a school or college. A vast majority of respondents, however, had done at least some college-level work, with more than half holding a bachelor's degree or higher. For almost two-thirds of respondents, the courses represented their first MOOC experience. In terms of motivations for taking the courses, respondents most often cited general interest in the topic, extending their knowledge of the topic, or professional development.

The course developers, who were the primary support staff during the

run of the courses, noticed a consistent pattern with respect to the weekly release of each new lesson. Not unlike the lines at an Apple store when a new version of the iPhone is released, a core group of students awaited the release of new materials and eagerly dove into them as soon as they were available. These students were key to the courses' success because they would often flag any issues within the first few hours through posts in the forums. By monitoring the forums, the course developers could quickly address the issues for the majority of students entering the course thereafter.

The temptation to respond immediately to each question in the forum was strong, but it became clear that students—particularly a small group of heavily involved students—would help each other. The rule of thumb was to spend more time monitoring the forums in the hours following the release of a new lesson and then to pull back and check in daily afterwards. The volume of posts was so high that both courses needed improvements to the forums. Professor Stearns took the approach of adding a direct link to the forums specific to the new week on the left navigational panel of the course. He also created a screen capture video directing students to the link. For *Songwriting,* the course developer created sub-forums that mapped to the different lessons in the course.

One issue that quickly arose was student confusion around due dates for quizzes, assignment submission, and peer review. The course schedule page for each course provided an overview of what would be due when based on Eastern Standard/Daylight Time; however, students either assumed the time referred to their own time zone or had trouble mapping the time to their own. A solution that worked particularly well in the music production course was to embed a Google calendar of deadlines on the course schedule page. The calendar natively display deadlines in a student's own time zone.

During the courses, students commented quite a bit about the peer-review assignments. Some students in *Music Production* complained about having to teach other students; instead, they wanted to create and share music. To provide students with an opportunity to share, Professor Stearns created a collaborative music project in which he invited students to record short audio clips—lyrics, "oohs," "aahs," bass tones, percussive hits, grooves, and riffs—and upload them to SoundCloud. He then created sampled instruments from the sounds that students, in turn, could use to create music.

Songwriting students had a number of discussions related to the quality of the reviews they were receiving from fellow students. Some felt that

their evaluators did not understand the material covered in the lesson well enough to assess the work of others; others felt that some students were overly harsh in their feedback, particularly when an assignment required students to sing their songs. (Professor Pattison made it clear that students were not to judge each other's vocal abilities, but rather use the performances to better understand the relationship between a song's lyrics and music.) Still others complained of plagiarism in students' work (at least one student chose to post singer-songwriter Avril Lavigne's lyrics for an assignment).

A number of students felt they benefited from the evaluations they were receiving—that the good outweighed the bad. Some students, confident in their ability to evaluate others, indicated they would evaluate more than the required minimum to help offset any bad evaluations. Still others, unhappy with the quality of the evaluations they received, chose to post their assignments in the forums for additional feedback.

As collaboration can be an important component of songwriting, Professor Pattison at the course's end encouraged students to form teams and work together on "14-day challenges" involving the use of metaphor in writing. Similar to the collaborative music project in *Music Production*, the challenges provided opportunities for students to engage with each other creatively and beyond the baseline course requirements. They also helped revive forum activity after the course was over.

At the courses' end, the course developers triggered the grading process that would determine which students would receive a Statement of Accomplishment, and we began evaluating the experience, looking at the raw data of student activity in the courses and the final course survey results.

EVALUATING THE FIRST RUN

One of the appeals of MOOCs from an institutional perspective is the ability to track student interaction with the courses at enormous scale. Once Berklee's MOOCs ended, the first question was the percentage of students who earned the Statement of Accomplishment. The answer: five percent in each, which is consistent with other MOOCs. Then began the dialogue of how we should be measuring retention—a topic that has received a lot of attention among MOOC providers.[1]

Professor Stearns suggested we write off the first week:

With a free course like this, the first week functions like the registration catalogue at a traditional college. In that week, the student is deciding on the format (online learning and MOOC learning), the teacher, the skill level, and the time commitment. After that first week, the student understands what they have signed up for. I would suggest enrollment in a MOOC be defined by who starts the second week. That I think is a better measure of enrollment and a starting point to measure retention.

We decided to take a closer look at retention among students who viewed at least one lecture in week two and for students who completed at least one quiz in week two. For the week two "viewers," we found the retention rate doubled to 10 percent. For the week two "quiz takers," the retention rate doubled again to 20 percent. Tables 1 and 2 compare activity among all registered students, the week 2 viewers, the week 2 quiz takers, and those earning a Statement of Accomplishment.

Table 1: Key figures for different student populations in *Introduction to Music Production*

| Introduction to Music Production	All Regis-tered	Week Two Viewers	Week Two Quiz Takers	Statement of Accomplishment Earners
Students	55,908	25,268	12,526	2,735
Retention rate	4.89 percent	10.82 percent	21.83 percent	100.00 percent
Quizzes taken	4.95	10.83	20.3	41.5
Submitted assignments	0.3	0.72	1.75	5.15
Peer evalua-tions	1.52	3.68	7.37	28.93
Videos	28.52	66.33	84.09	139.87

Table 2: Key figures for different student populations in *Songwriting*

Songwriting	All Registered	Week Two Viewers	Week Two Quiz Takers	Statement of Accomplishment Earners
Students	66,641	32,938	16,408	3,439
Retention rate	5.16 percent	10.44 percent	20.96 percent	100.00 percent
Quizzes taken	4.03	8.54	16.4	31.35
Submitted assignments	0.46	1.06	2.07	5.59
Peer evaluations	2.18	5.01	9.96	30.33
Videos	16.02	35.61	47.83	86.64

We then examined engagement over time with regard to assignment submissions, forums posts and comments, lecture viewing, and quizzes.

Figure 1: Overall activity for the population of registered students—assignments, forum, lectures, and quizzes
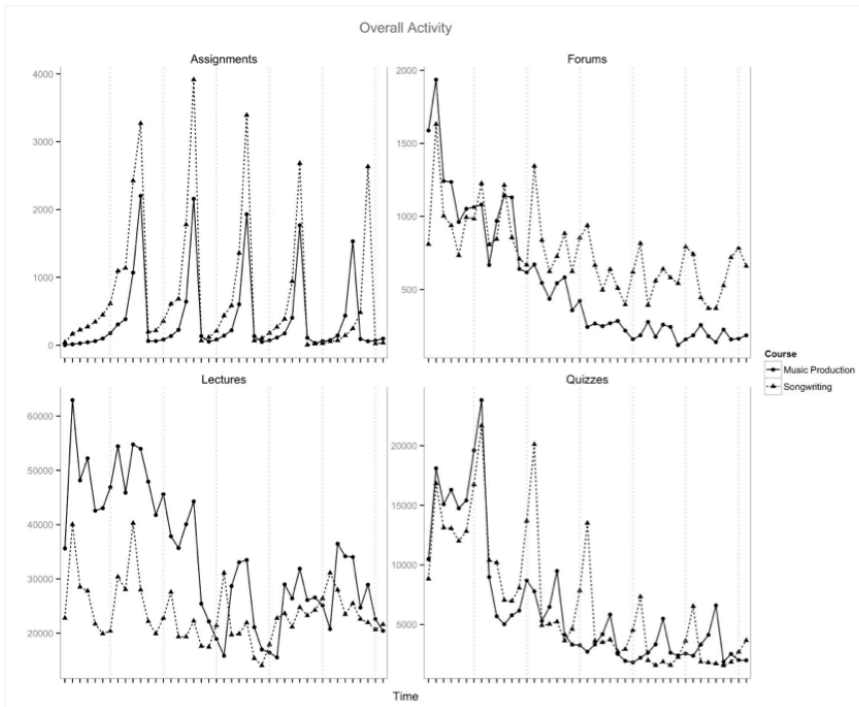

As figure 1 shows, assignment submissions decreased relatively less than

quizzes, which suggests that students stayed more engaged with assignments than quizzes, though both contributed heftily toward the final grade.

Forum activity decreased strongly as the course progressed, whether looking at the number of posts and comments or the number of users actively engaged in the forum day by day, the latter of which figure 2 illustrates. The data showed periodic spikes in activity in *Songwriting* after the course ended that were likely the result of the 14-day challenges that Professor Pattison encouraged students to work on together.

Figure 2: Number of users in the forums over time
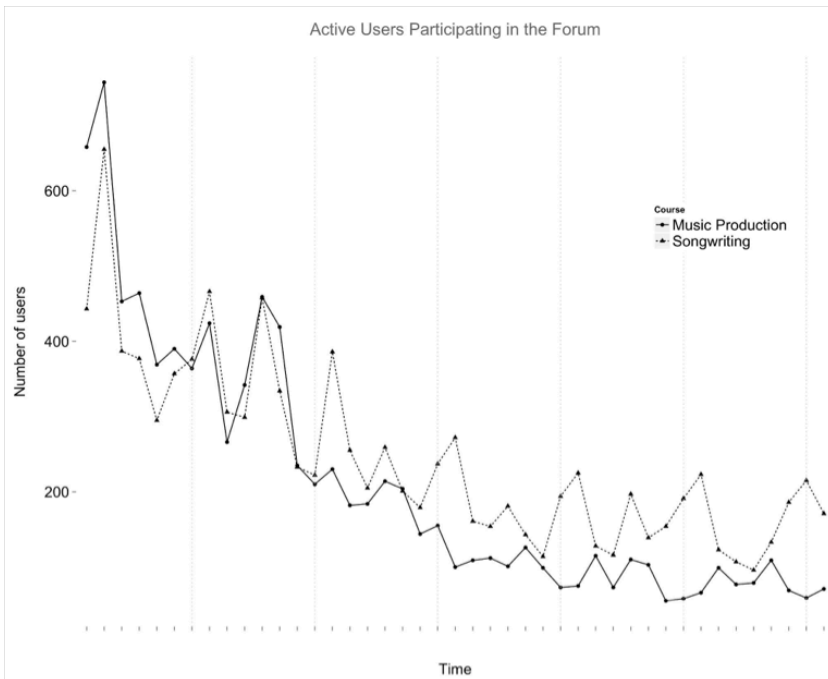
We then turned toward the peer-review assignments—particularly given that they were an area that students commented on a great deal, whether in the forums or in the final course surveys—to see what patterns emerged related to retention.

Figure 3 shows the evolution of the average final grades of students as they evaluated more assignments than the required number. The more students evaluated other students' work, the higher their final grades, although no extra credit was given for evaluating more than the required number of assignments.

Figure 3: Final grade increases as the students evaluate more assignments
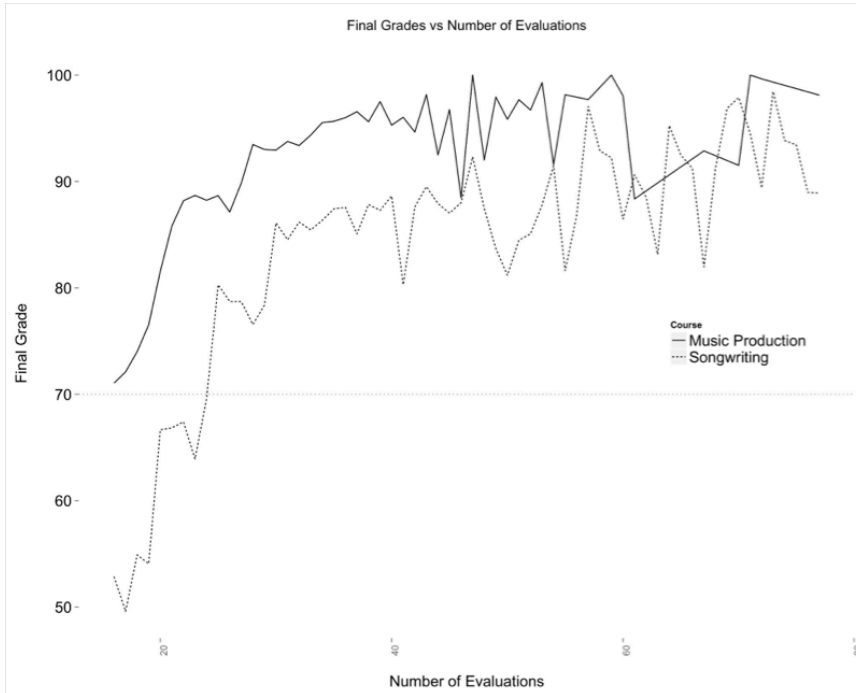
Next, we examined the spread of the grades given for peer reviews (figure 4). After week two, over half of the students in *Music Production* earned the maximum number of points, and except for week one, all students received scores above the passing threshold. The consensus among evaluators, it seems, is that students did a good job of teaching concepts related to the course material.

In *Songwriting* the findings were more balanced—only about half of students were given passing scores each week. There was much more disagreement about what constituted good songwriting.

Figure 4: Peer review grade spread [2]
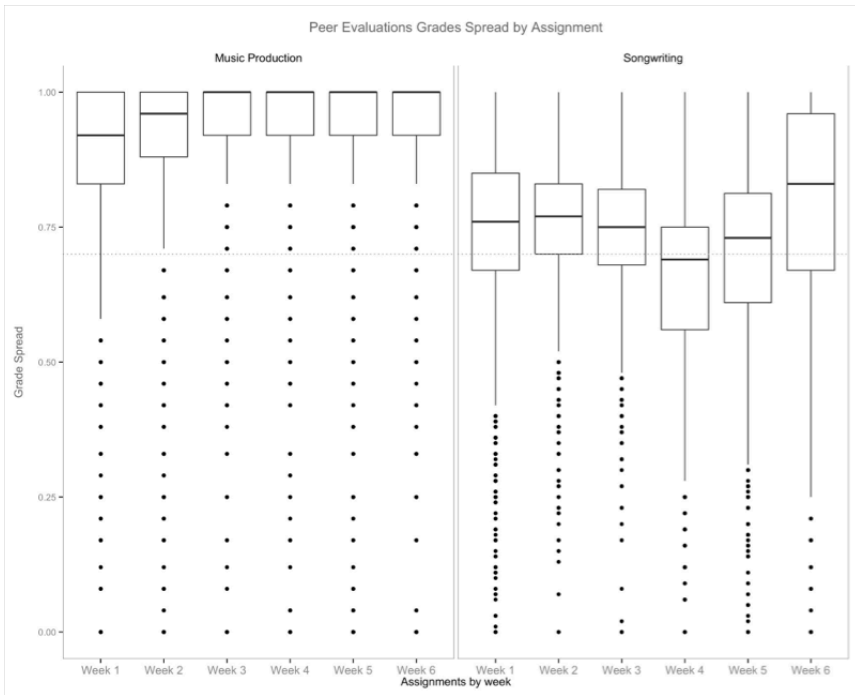
When we looked at the results of the final course surveys and, in particular, the questions "What did you like best about this course?" and "What did you like least about this course?" the feedback could not be more explicit.

We received around 2,300 answers to both questions for *Songwriting* and about 1,300 for *Introduction to Music Production.*"The teacher was what students liked best, by far. Many students answered along the lines of "Pat is an amazing and gifted teacher!" or "Pat Pattison!! Best instructor I've had for anything in a long, long time" or simply "Pat!", indicating that although the teachers were only available through lectures and in the forum, students had a strong connection to them.

Second to the teacher was the content. Elements repeatedly mentioned in the survey were the lectures, the videos, the course material, the quizzes, the assignments, the scope of the course or simply the course, itself. In *Music Production*, words and phrases like "practical" and "depth of the information" appeared frequently.

Figure 5: Cloud of most frequent words in the answers to "What did you like best about this course?" for *Songwriting*

Figure 6: Cloud of most frequent words in the answers to "What did you like best about this course?" for *Introduction to Music Production*

When asked that they liked least, the overwhelming answer among *Songwriting* students was peer reviewing. The feedback focused on the reviewers not being qualified to grade other students' work for reasons such as not understanding the concepts taught in the course or not being native English speakers and, therefore, unable to understand what was presented in a song.

Figure 7: Cloud of most frequent words in the answers to "What did you like least about this course?" for *Songwriting*

Introduction to Music Production students liked the nature of the assignments least. Students also found the course to be too short in duration and the peer reviews to be too time consuming.

Figure 8: Cloud of most frequent words in the answers to "What did you like least about this course?" for *Introduction to Music Production*

The students were also asked for suggestions on how to globally improve the course. In both courses, most answers focused on improving the peer-review system. Some very pertinent recommendations emerged, such as two-way communication between evaluator and student, detection of plagiarism, and validating students' understanding of the course concepts before proceeding with peer review—ideas that would require support within the Coursera platform.

LOOKING AHEAD

Since the first run of *Songwriting* and *Introduction to Music Production*, Berklee has offered two other MOOCS through Coursera, an introduction to guitar and an improvisation course. All four courses will be offered again periodically throughout the year.

In preparation for the next offerings, the course-development team is focused on a few key areas. First and foremost are the peer-review assignments because of their potential to influence student engagement and learning outcomes. Course developers will refine the rubrics that students use to evaluate assignments, incorporate examples of the teacher evaluating assignments, leverage quizzes to help students prepare for peer review, and identify ways to incentivize students to evaluate more than the minimum number of assignments. The team is also giving thought to design considerations for lesson two that would motivate students to continue the course, the assumption being that those who show up for lesson two have a strong intention to complete. And, last but not least, the team is looking for ways to apply what they have learned through the MOOC experience to continually improve the instructor-led courses offered through Berklee Online.

ENDNOTES

1. Koller, D., Ng, A., Do, C., & Chen, Z. (June 3, 2013). Retention and intention in massive open online courses: In depth. *Educause Review.* http://www.educause.edu/ero/article/retention-and-intention-massive-open-online-courses-depth-0; Devlin. K. (March 2, 2013). MOOCs and the myths of dropout rates and certification. *Huffington Post.* March 2, 2013. http://www.huffingtonpost.com/dr-keith-devlin/moocs-and-the-myths-of-dr_b_2785808.html; Kizilcec, R. F., Piech, C., & Schneider, E. (2013) Deconstructing disengagement: Analyzing learner subpopulations in massive open online courses. In *Proceedings of the Third International Conference on Learning Analytics and Knowledge* (pp. 170–179). New York, NY, USA: ACM. http://rene.kizilcec.com/wp-content/uploads/2013/02/Kizilcec-Piech-Schneider-2013-Deconstructing-Disengagement-Analyzing-Learner-Subpopulations-in-Massive-Open-Online-Courses.pdf; MOOCs @ Edinburgh Group (May 10, 2013). MOOCs @ Edinburgh 2013–Report #1. http://www.era.lib.ed.ac.uk/bitstream/1842/6683/1/Edinburgh%20MOOCs%20Report%202013%20%231.pdf

2. A bit of explanation on this box plot: The horizontal dotted gray line indicates a normalized grade of 0.7, which translates into a final passing grade. The thicker line in the boxes indicates the median of the grades, i.e., the separation between the upper and lower half of the students' grades. The boxes' lower and upper limits indicate the 25 percent and 75 percent range of students' grades. Finally, the dots are statistical outliers, i.e., the lowest grades that concern few students.