
METHOD OR MEDIA: 10 DO'S AND SOME DON'TS FOR USING MEDIA IN ONLINE POST-SECONDARY EDUCATION

Albert Schram, University of Maryland Global Campus (UMGC) – Europe, Italy

Abstract

For effective online teaching and learning there is no short-cut for good instructional design, as well as following well-established pedagogical practices. For universities in the post-pandemic era, the main challenges for delivering quality online programs are, first, to provide good access through high quality digital infrastructure, and, secondly, to assure that all lecturers are trained in modern pedagogical approaches, basic instructional design principles for online teaching, and media usage.

In my own experience, following the eight QM “Quality Matters” standards, will go a long way in improving online instruction and student engagement. These standards provide a simple, proven and robust framework, even for the inexperienced to design and deliver an effective and engaging course. Universities that have consistently applied QM standards, for example, dominate the rankings for best online programs in the USA (QM 2020). Uniquely, QM offers a low-cost training program on online teaching that can be rolled out at scale for lecturers at member universities and schools, that includes all elements for developing and delivering effective online courses, including the use of media.

The use of media in any course is always optional. Recent research, however, shows that the use of media, in particular asynchronous video in combination with other learning materials, can lead to substantial improvements in learning. This research found that the combination of solid instructional design and the appropriate use of asynchronous media in online or hybrid courses can be more effective than traditional face-to-face teaching, due to more focused content, and students being able to rewind thus avoiding feeling overwhelmed (Noetel et al., 2021). Finally, I offer 10 helpful pointers for developing and delivering online courses using media, for those of us who are not experienced online instructors, or instructional designers.

Introduction

In this paper, I will discuss some of the implications of using media in teaching adults, following a recently published, and rather definitive meta-study on the topic (Noetel et al., 2021). First, I will give a general introduction to what constitute good pedagogical practices and solid instructional design during an ongoing technological revolution in both face-to-face as well as online teaching and learning. Secondly, I will summarize research showing that the use of asynchronous videos in courses can substantially improve learning. Thirdly, I will list the practical implications for development of online courses, and the practices and tools for delivering them effectively. Some media turn out to be more apt for specific learning objectives than others, and this must be taken into account when designing a course, or when selecting specific type of media.

Background

The history of technology of the past centuries suggests that broad impact of a technological innovation often occurs four decades or more after initial implementation, when the technological revolution really takes place (David, 1990). Since the mobile internet is now barely twenty years old, what we are seeing today therefore may just be the start of a technological revolution. The use of media in teaching adults has become more common, since now every cell phone has good a camera and microphone with the capability to produce high-quality videos or audio.

Recently, we have seen false optimism about how technology can improve learning. The emergence of Massive Open Online Course (MOOCs) with recorded lectures in the early 2010s, for example, turned out not to be such a technological revolution after all, with only a small percentage of participants actually finishing the courses (Parr, 2013).

In post-secondary education, the process of digitalization and use of artificial intelligence, has meant services once delivered by a single institution can now be offered separately, or in different combinations. This unbundling of educational services driven by digitalization was recently accelerated by the need to develop online teaching due to the COVID19 pandemic. As Lawrence Summers, President Emeritus of Harvard University wrote: "Certainly there are challenges ahead, but surely also opportunities for those bold enough to seize them. The potential unbundling is a certainly a threat, but those who re-bundle well will find they have reinvented higher education for the 21st century." (Barber et al., 2013; p.v).

The discussion on what works and what does not in education can be confusing and spans the whole range from overly simplistic and optimistic techno-visions about dynamic classrooms (Craig, 2017), to utter pessimism about the possibility to measure educational outcomes in adults. The truth is somewhere in the middle. It seems unlikely that there are

simple technological fixes for good teaching, such as superior recording equipment or systems that mimic the physical classroom. Conversely, it is too pessimistic to say that no agreement will ever be achieved about what the desired learning outcomes for post-secondary programs will be, as the ill-fated AHELO surveys by the OECD showed (OECD, 2013).

Method: what works and what doesn't in face-to-face and online teaching and learning?

For face-to-face teaching, educational research gives a good indication of what works, and what does not. Some of us, intersperse our lectures with probing questions which we sometimes call “the Socratic method”. Nobel Prize winner Carl Wieman at Stanford was mystified by their PhD students still being unable to do physics. He developed what he called experimental teaching, which “puts the problem first”. Through rigorous experimental research he was able to show that with improved teaching learning gains increased an order of magnitude (Adams & Wieman, 2011; Deslauriers, Schelew, & Wieman, 2011; Wieman, 2014).

When sticking to the traditional lecture format, however, it is hard to consistently “put the problem first” in all your classes. Since the 1960s problem-based learning (PBL) has addressed this challenge. It has taught the lecturers to withdraw and leave more control to the students. PBL is widely used in medical education, but also in engineering, though only a dozen or so universities in the world use it consistently across all disciplines. Maastricht University, for example, has developed a structured 7-step PBL approach, which is quite robust and at the same time flexible. There is extensive literature on the benefits of PBL, including higher retention rates (Moust, 2007). PBL is more effective because it starts with a problem, and it challenges the learners to take responsibility for their own learning and progress by formulating learning objectives and producing content themselves. Though it is essential a small group teaching method with lots of interaction among students, it can be adapted to larger groups (Roberts et al., 2005).

In addition to face-to-face pedagogy, what are the particular challenges in online teaching and learning? About 15 years ago several universities in the USA decided to set up QM “Quality Matters”, a non-profit that has now over 1,700 members in 27 countries. QM is based on the premise that there is no short-cut for good instructional design and alignment. It starts with research and then incorporates best-practices identified by a community of practitioners. According to QM, there are essentially six variable that determine the success of online teaching and learning: starting with course design, course delivery and course content, which the lecturer can control. Institutional infrastructure, the learning management system, faculty members and students' readiness also play an important role.

Moreover, QM has formulated an eight standards presented in a rubric form on which online teaching and learning should be based. These standards are support by leading educational research, but also on extensive experience of lecturers at member university who form a community of practices and discuss regularly what works and what does not in online education.

The eight general standards of the QM rubric cover the following themes:

1. Course Overview and Introduction;
2. Learning Objectives (Competencies);
3. Assessment and Measurement;
4. Instructional Materials;
5. Learning Activities and Learner Interaction;
6. Course Technology;
7. Learner Support;
8. Accessibility and Usability.

The key challenge for course development is to achieve alignment between Learning Objectives (Competencies) (2.1, 2.2), Assessment and Measurement (3.1), Instructional Materials (4.1), Learning Activities and Learner Interaction (5.1), and Course Technology (6.1). When these elements work together, students achieve desired learning outcomes. As to standard 3 regarding assessment and academic integrity, we assume here that issues of academic corruption and plagiarism are successfully being addressed by the institutions general policies and quality standards. QM has separate and somewhat different standards for higher education, K-12, and Continuing Professional Education, but the 8 general standards remain the same (QM 2021). Similarly, general pedagogical principles discussed above still hold, and can easily be combined with the 8 standards.

Media: what role for asynchronous video?

While it may seem like it is important to know whether instructional design or media use makes the largest difference in learning gain, in reality that both are important. Good course design can work without videos, while videos cannot work without good course design. According to cognitive theories of multimedia learning, both face-to-face classes and video conferences, as well as asynchronous videos can all maximize the use of our cognitive infrastructure, since operate both visually as well as through sound (Mayer, 2008). A picture says more than a thousand words, and a video with text can be even more eloquent.

The meta-analytic study by Noetel et al. (2021) analysed 105 past randomized trial studies including 7,776 students, and examined at the effects of videos on learning as compared to the use of other teaching mediums, such as in-person lectures and assigned readings. Overall, when students got videos instead of usual form of teaching their average grades increased from B to B+, but when videos were given in addition to their existing class, the effect was stronger, moving students from a B to an A. The study found that videos were more effective for teaching skills than for transferring knowledge. The two main explanations for these results are that first, videos give students the ability to better control their own pace of learning, thus reducing the likelihood of them feeling overwhelmed, and secondly that pre-recorded videos allowed lecturers to fine-tune how they present information, and thus avoid some of the noise and confusing information that can creep into in person lectures.

From this study, it seems clear therefore, that as a complement to traditional text-based teaching materials, asynchronous videos can be a very power tool to enhance student engagement and learning.

Teaching Strategy and Your Toolbox

The key question concerning teaching strategy is: what do you want the students to do before class, and what do you want to do during and after the class? It is hear that media can play an important role. Before class, we need to have assurance that students understand basic concepts and have mastered essential information. Given the diverse educational backgrounds of especially non-traditional students, those with families and older than 24 years, this has become essential to conducting any meaningful class discussion.

The instructor is left to figure out how better curriculum design and course delivery can enhance active learning and student-centred teaching. The bewildering diversity of types of media can make this task challenging. Video, and audio can be used for course introduction, course promotion, personal introductions, module introduction, instead of traditional lectures or for lecture capture, student feedback, course announcements, interview, event or debate recording, role play, case study or scenario, students' presentations in project, problem or case-based learning, etc. Media is more than just video, and you can use audio recording, voice over slide presentation or screen-casting to demonstrate a website or software.

So what can I recommend based on my recent experience teaching online? I found it most efficient to prepare the whole structure of the course with its learning objectives offline in a spreadsheet, with matching self-assessment, quiz and examination questions. This assures maximum coherence and minimizes waiting times of working online directly in

the Learning Management System. Next classify selected video into three categories: short introductory 2-3 minutes, and somewhat longer content rich, teaching videos 5-10 minutes for students to do before each class, and finally mini-lectures or traditional lectures cut up in pieces of 10-15 minutes to stimulate class debate and reflection.

For activating existing knowledge or going over the basics, identify short video's with transcripts and provide it to the students, either auto-generated on YouTube. Provide transcripts for the mini-lecture videos, and complementary readings, providing self-assessment questions for each step. You can produce an introductory video, but the students really don't need to see your face online each session. Classify video's to stimulate interest and engagement vs. video's to stimulate thinking and discussion. Include an online discussion board when appropriate, and provide a message reinforcing what has been learned at the end. Finally, for a hyflex design, those students who cannot attend your (online) class can be asked to answers self-assessment questions and contribute online to the class debate, using Google Docs, or a discussion tool like Kialo or Perusall. To stimulate reflection after class, you can post a recording of presential class debates, or record a short video summary yourself.

10 Do's

In order to break online course development down even further, keeping in mind what I said above about method and media, here are 10 Do's and a 5 don't, reflecting what I learned from over a decade of online teaching. I hope it will be useful for you, although you will have to adapt according to your own objectives and teaching style.

1. IT: set up your PC properly, including automatic backups. If you don't have a new computer with the latest proprietary operating system, you should consider installing open-source Linux distribution.
2. Course structure. Curriculum development need not be done online, rather you can prepare the whole structure of the course with its learning objectives in your spreadsheet, with matching self-assessment, quiz and exam questions.
3. Video selection. Select short videos three kinds: short introductory 2-3 minutes, and somewhat longer content rich, teaching videos 5-10 minutes for students to do before each class. In class, you can use recorded lectures, your own or other people's, but you need to chunk it up in section of no more than 10 or 15 minutes. Provide transcripts of the videos, and optionally complementary readings, providing self-assessment questions for each step. You can produce an introductory video, but the students really don't need to constantly see your face online each session.

4. Classify video's to stimulate interest and engagement vs. video's to stimulate thinking and discussion. Include activities, either self-assessments for all activities and polls to stimulate discussion.
5. Transcripts and YouTube lists. For activating existing knowledge or going over the basics, identify short video's with transcripts and provide it to the students, either auto-generated on YouTube. Remember some students are good at listening, others need to read the text.
6. Learning Management System. Use any Learning Management System, but remember no LMS offers all functionality you may want. Use the import function on your LMS to assure consistency in the self-assessment, quiz and exam questions.
7. Formative assessment. Include mandatory self-assessment, and feed these into slightly more complicated quiz questions. These can all be automatically graded multiple choice, true/false or fill-in-the-blanks questions. Rather than an examination, it is advisable to include some assignments with open questions or problems to solve.
8. Required vs recommended materials. Provide additional information in text or video, so as to show multiple perspectives or extensions. Give links to YouTube list, but do not rely on it as the only source.
9. Online discussion boards. Include an online discussion, and provide a message reinforcing what has been learned at the end. Summarize the online discussion by conducting and summarizing online polls.
10. Chunking. Finally, in the classroom provide extra material by presenting a video lecture in bite sized bits of no more than 10 minutes with self-assessments.

Elsewhere, I have described which software tools I personally use to make it easy to include media into your courses, including Google slides, Polleverywhere, Edpuzzle, Nearpod, and others.

Some Don'ts

Here are some things that I suggest should be avoided:

1. Do not try to replicate a face to face lecture online. Effective teaching is like parenthood, it is all about letting go. Do not try to control all content, all dynamic, and make yourself the centre of to the students' learning experience.
2. Do not fixate on giving your own lectures, and acting as if only synchronous activities can produce learning. On Open Course repositories or YouTube you will find instructional videos, or recordings of public lectures and debates of people much more knowledgeable than yourself on specific topics.

3. Do not believe technology will fix your teaching issues, you will need to become familiar with basic pedagogy, instructional design concepts.
4. Do not have your groups of students sit for hours and hours behind their screens looking at you lecture, without engaging with each other, with learning materials or doing any other meaningful learning activity.
5. Do not talk about online learning and teaching as inherently inferior to face to face teaching, and something to be avoided as soon as the pandemic is under control.

Final Remarks

Using asynchronous videos in your courses can be a powerful tool (Noetel et al., 2021), but you have to be clear for what purpose you want to use media by consistently applying widely accepted instructional design standards such as QM. In addition, it helps to have a theory-based, student-centred pedagogical approach such as Problem Based Learning.

With the right tools, course preparation does not have to take much longer than for any other regular class. Finding alignment between materials, activities and assessments through proper preparation, certainly beats the centuries' old tradition of producing the teaching materials on the white board in class for one time use only.

The avalanche of digital and information technology, online delivery of courses, and unbundling of services is coming towards us. How fast it travels and whether it will affect all players in equal measure is still unclear. The COVID pandemic has certainly accelerated these processes, and lecturers and students alike have found positive things about online teaching, which will be here to stay.

References

- Adams, W. K., & Wieman, C. E. (2011). Development and Validation of Instruments to Measure Learning of Expert-Like Thinking. *International Journal of Science Education*, 33(9), 1289-1312. <https://doi.org/10/cfzxhr>
- Craig, R. (2017, January 20). The Top 10 Higher Education Issues We All Agree On. Forbes [Blog post]. Retrieved from <https://www.forbes.com/sites/ryancraig/2017/01/20/the-top-10-higher-education-issues-we-all-agree-on/#1c7f3a61fa87>
- David, P. A. (1990). The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox. *The American Economic Review*, 80(2), 355-361. Retrieved from <http://www.jstor.org/stable/2006600>
- Deslauriers, L., Schelew, E., & Wieman, C. (2011). Improved Learning in a Large-Enrollment Physics Class. *Science*, 332(6031), 862-864. <https://doi.org/10/c3jj3m>

Moust, J. (2007). *Introduction to problem-based learning: a guide for students* (2nd rev. ed.). Wolters-Noordhoff.

Noetel, M., Griffith, S., Delaney, O., Sanders, T., Parker, P., del Pozo Cruz, B., & Lonsdale, C. (2021). Video Improves Learning in Higher Education: A Systematic Review. *Review of Educational Research*, 91(2), 204-236. <https://doi.org/10/gjmdv6>

Organisation for Economic Co-operation and Development – OECD (2013). Measuring Learning Outcomes in Higher Education: Lessons Learnt from the AHELO Feasibility Study and Next Steps. Retrieved from <https://www.oecd.org/site/ahelo/>

Parr, C. (2013, May 10). Not Staying the Course. New study of low MOOC completion rates. Inside Higher Ed [Blog post]. Retrieved from <https://www.insidehighered.com/news/2013/05/10/new-study-low-mooc-completion-rates>

Roberts, C., Lawson, M., Newble, D., Self, A., & Chan, P. (2005). The introduction of large class problem-based learning into an undergraduate medical curriculum: an evaluation. *Medical Teacher*, 27(6), 527-533. <https://doi.org/10.1080/01421590500136352>

Wieman, C. E. (2014). Large-scale comparison of science teaching methods sends clear message. *Proceedings of the National Academy of Sciences*, 111(23), 8319-8320. <https://doi.org/10/gd6fw3>