Microlectures in a Flipped Classroom: Application, Creation and Resources

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Using microlectures in a flipped classroom is a growing trend. In this media review, the benefits of microlectures for such classrooms are discussed, including how they can be used to help students become more responsible for their learning, as well as how they can be used by teachers to provide differentiated instruction. A list of resources for creating microlectures is included.

A growing trend in both brick-and-mortar, and online classrooms across the nation is the use of microlectures in a flipped classroom setting. Jonathan Bergmann and Aaron Sams (2012), pioneers of using the flipped classroom, describe the concept simply as, "that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class" (p.13). Such a strategy is built on providing conceptual knowledge via multiple media methods outside of designated class periods, while application of learned conceptual knowledge is applied to problem-based team activities during arranged face-to-face or synchronous online class periods.

A key component to successful blended or flipped classroom practices has been the microlecture. Educause (2012) defines a microlecture as, "a short recorded audio or video presentation on a single, tightly defined topic" (p. 1). Microlectures are generally comprised of a lecture or demonstration, a narrated slideshow, or a screencast accompanied by a voiceover. The brief nature of microlectures allows them to be easily shared through a dedicated Learning Management System (LMS), institutional iTunesU account, or a public video sharing site, such as TeacherTube, YouTube, or Vimeo.

Application

Effective and successful use of microlectures in a flipped classroom environment requires a significant amount of planning; however, beginners wanting to use this strategy can start without a total transformation of their teaching. For example, microlectures may be appropriate to prep students with small chunks of new information necessary before learning the skills to participate in classroom projects, labs, or discussions. Microlectures can also be used as a way to create curiosity and interest for a new topic prior to introducing it in class. Furthermore, they can be helpful when teachers wish to briefly recap information that was learned in a classroom activity or discussion. Using microlectures as brief introductions or summaries can help students get ready for new learning, review for an exam, or prepare for the application of skills.

Whether being used in a fully or only partially flipped classroom it is important to ensure that microlectures are used to create a learning environment where students take some responsibility for their own learning. Such instructional design requires a balanced blend of direct instruction

and constructivist learning and must be followed up with appropriate support from the teacher. Microlectures are not intended to simply be online videos for students to watch. Such inappropriate use of microlectures has prompted opposition to using this tool in flipped classrooms. Some suggest that micolectures lead to less engagement by students and allow instructors to be replaced by lectures. These perceptions are incorrect if the flipped classroom strategy is implemented correctly. The advantages of microlectures in a flipped classroom include the differentiation of instruction and the increased engagement during face-to-face class time.

Differentiation

Since microlectures use multiple media methods in their delivery and are available to students outside the classroom, they can provide a personalized rate of consumption. Students can watch the videos as many times as necessary to learn the material; ". . . students can pause their teacher, rewind their teacher, and make sure they actually learn the important concepts" (Bergmann & Sams, 2012, p. 23). These features allow students at various learning levels to achieve course objectives at a pace suitable for them. As a student has been quoted, "If you already understand it and want to go at a faster pace you don't have to wait on other students to ask their questions" (Flipped Learning, 2010). While this does not solve the issue of differentiating instruction for students, it provides a significant support in reaching this goal. Bergmann and Sams (2012) say, "When we talk to teachers around the country, most admit they are not differentiating very well because they are not physically able to meet every student's individual needs" (p. 62). Additionally, they found that most teachers were teaching to the "middle" of their class because the size of their classes and time limits were overwhelming to them. The incorporation of microlectures alleviates some of these pressures and provides for more individualization by allowing asynchronous delivery of direct instruction.

For example, Karl Fisch, a 25-year practicing Algebra teacher and owner of *The Fischbowl* blog (Fisch, 2010 April 19) shares his personal story of how his traditional approach to homework (e.g. assigning 1-31 odd, or other selections of problems) was yielding results that indicated his current practice of assigning homework was problematic. Traditionally, Fisch's course homework results consisted of a portion of the class being able to complete all of the problems with little or no challenge, a second group of students that would not even attempt the problems for reasons such as, "just didn't want to do it, not enough time, and not enough understanding" (para 3), and a third group that would attempt the homework, but become very frustrated because they could not work the problems or because they completed them, but did them incorrectly. In effect this group reinforced doing the problems incorrectly. Fisch discovered, "What they needed was to be able to work on those problems when I was available to help, or when others were available to help but not on their own where if they were confused they just ended up frustrated or worse, cementing incorrect procedures in their brains," (para 3). Fisch aspired to meet these challenges by delivering his traditional lecture via a 10 minute video microlecture to be reviewed by his students outside of class and increasing the amount of class time available to explore mathematics and participate in guided practice while working through problems collaboratively with him (the teacher) and student peers. Fisch's integration of microlectures demonstrates that they can provide more in-class time for application of skill and problem

solving. Thus, lessening the possibility of the student getting lost when working on the homework alone outside of class, which can cause frustration and non-completion.

Engagement

If microlectures are used to teach basic concepts outside the classroom, this allows for an increase in active learning during class time, which has been shown to enhance student learning. The role of the teacher in face-to-face settings changes from a presenter to a learning coach. Classroom time is spent talking with the students and working alongside them. Teachers who implement microlectures for the delivery of direct instruction can instead spend a typical class period assessing mastery, providing remediation as necessary, answering questions, working with small groups, and guiding the learning of each student individually (Bergmann & Sams, 2012). Students have noted the benefits of this. In informal interviews, students noted that, "It gives you an opportunity to talk to the teacher about problems you are struggling with," and "You can get more help on the assignments at school instead of struggling with them on your own" (Flipped Learning, 2010).

Not only do teachers gain the benefits of increased interaction with their students, student-to-student interaction is also increased. In this environment teachers see their students relying more on each other to develop new understandings and to expand their learning. Class time can be used for team laboratory exercises, problem-based learning, fieldwork, research, and experiential learning opportunities.

The ways in which microlectures can help free up class time for the increased social construction of knowledge are endless. However, it is important to note that the individual and often solitary action of viewing the microlecture can, itself, also increase engagement. Engagement is not defined only by the interaction between students and teachers, but engagement also refers to an individual's interaction with the material they are learning. Student engagement is any learning that is "active, goal-directed, flexible, constructive, persistent, [and] focused" (Furrer & Skinner, 2003, p. 149). Asking students to be responsible for the learning of basic concepts removes them from the position of a passive learner sitting in a classroom, waiting for other students to ask and respond to questions. Microlectures require more self-regulation on the part of the students. Some students in flipped classrooms using microlectures have noted that the "chance to teach themselves," "helps you do better on exams because if you have to learn it and do it yourself you will remember and know it for the test (Flipped Learning, 2010).

Creating Microlectures

Technologies essential to creating microlectures include, an audio or video recorder (either a camera, iPad or tablet device, or a laptop with a built-in camera and microphone), video editing application (iMovie, Windows MovieMaker, QuickTime Pro, etc.), and a private LMS, or a public video sharing account (such as YouTube, Vimeo or TeacherTube) for distribution to students. Teachers interested in creating their own microlectures should acquire basic skills in video or audio recording, screen recording, and video editing.

The actual creation of a microlecture process is simple. A helpful place to start is with a script, which makes the recording and editing process much easier. Having a script also provides necessary transcripts for universal design compliance. After writing a script, the next step is to record the audio, video, or screencast. Upon completion of the recording, editing is typically needed for a more professional final product. Finally, the finished file will be saved and shared to a student access point. Table 1 provides a comparison of popular applications for developing microlectures.

Answering the following questions can help you determine the best use and placement of microlectures in your classroom:

1. Are your learning objectives clearly defined and measurable? What exactly do you want your students to know or be able to do?
2. What will mastery of the objectives look like?
3. Do your current instructional resources provide multiple ways for engaging with content?
4. Can you use pre-made videos and content, or will you need to create your own?
5. Do you have a mechanism for evaluating the quality, authenticity, and validity of your resources?
6. Have you designed in-class activities that allow students to place the content they are learning into a real-life context?
7. Does your instruction allow for multiple formats of student created content, independent problem solving, inquiry-based activities and/or project-based learning?

Access to Technology

A sincere concern with the use of micolectures is that not all students have the same access to technology. This is something that must be considered when making the decision to use this tool. Typically micolectures are available to students online, which requires a consistent and sufficiently fast connection to the Internet and requires a device with such access; however, this is an issue that can be easily accommodated as long as students are still able to access hardware at home, at school after hours, or in a library. Bergmann and Sams (2012) are from a relatively rural area in Colorado with many homes having no reliable Internet access. Their solution was to loaded videos on Flash drives and burned them to DVDs. Students could watch the microlectures from Flash drive without the need for the Internet on their television or simply on their TV by using the DVDs. Instructors moving to this method should survey their students to see what they will need to do when publishing their materials to ensure everyone has equal access.

Conclusion

The level of success a microlecture will have is greatly dependent on how well it is integrated into the learning objectives and in-class learning activities. While these are often used in flipped classroom settings, a total transformation is not necessary to start using this multi-media strategy. Engagement is the key students' success and microlectures provide an easy avenue to help students engage individually with the material and to open up class time for students to engage with each other and their teacher for a more performance based learning environment.

Author Notes

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Table 1

Comparison of Applications for Creating Microlectures

Name	Features	Ease of Use	Platform	Cost	Sharing
iMovie	Titles, Audio Effects, Image insertion, correction and adjustment, Audio and Video Transitions, Video Editing (trim,split,crop), Visual Effects, Audio Narration	Beginner Intermediate	Macintosh iPad iPhone	Mac $15.00 Mobil $ 4.99	.mp4 .mv4 Email iTunes YouTube Facebook Vimeo
Windows MovieMaker	Titles, Audio Channels, Audio Narration, Video Editing (trim, split, crop), Image insertion, Photo and Video transitions	Beginner	Windows	Free	DV-AVI Windows Media Portable Device Windows Media Standard and Widescreen Format Windows Media HD 720/1080 Windows Media Low Bandwidth Windows Media VHS Format

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Table 1*(continued)*

Comparison of Applications for Creating Microlectures

Name	Features	Ease of Use	Platform	Cost	Sharing
Jing	Screen Recording, Voice Narration Recording	Beginner Intermediate	Macintosh Windows	Basic Free Pro $15 Annual fee	Upload to TechSmith Server and Share Link or Download .swf (Flash) file and share via email, website, LMS
QuickTime Player for Snow Leopard and Higher	Screen Recording, Audio Recording, Video Recording, Video Editing (trim clip, split clip), Audio Editing (trim clip, split clip)	Beginner Intermediate	Macintosh	Free	.mov .mv4 .mp4 1080P, 720P, 480P, iPad, iPhone, AppleTV, Audion Only, iTunes.
QuickTime Pro	Audio Recording, Video Recording, Video Editing (trim clip, split clip), Audio Editing (trim clip, split clip)	Beginner Intermediate	Macintosh Windows	$29.99	mov .mv4 .mp4 1080P, 720P, 480P, iPad, iPhone, AppleTV, Audio Only, iTunes
ShowMe	Interactive Whiteboard, Record Annotations in app, Image Insertion, Voice Narration Recording	Beginner	iPad iPhone	$2.99	Export to file. Upload on your choice of sharing sites such as: YouTube, Vimeo, Dropbox, Institutional LMS or iTunes U program, website, etc.

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Table 1*(continued)*

Comparison of Applications for Creating Microlectures

Name	Features	Ease of Use	Platform	Cost	Sharing
ExplainEverything	Interactive Whiteboard, Record Annotations in App, Image Insertion, Crop Images, Insert Live Webpage, Annotation Effects such as: laser pointers and arrows, Voice Narration Recording	Beginner	iPad iPhone	$2.99	Export to file. Upload on your choice of sharing sites such as: YouTube, Vimeo, Dropbox, Institutional LMS or iTunes U , program, website, ect.
Educreations	Interactive Whiteboard, Record Annotations in App, Voice Recording, Insert Multiple Images, Crop, move and resize images to create animated playback, Features teacher account for creation and student account for viewing	Beginner	iPad iPhone	Free	Upload to Educreations hosting site, Share link via website, LMS, email.

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