Introduction

How to Use This Document

This guide was developed to help you quickly identify which technologies you want to use in your course, based on the modality and course activities you want to incorporate. If you are teaching in a physical classroom, you may also want to consider the technology available in the classroom, since COVID precautions may necessitate variations of hybrid teaching for the upcoming semester(s). Learn more about your particular classroom using 25 Live (instructions here).

To learn more about each of the technologies listed herein, please refer to the Brightspace D2L self-enrollment course Faculty and Staff - MSU Tools & Technologies.

Credit

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Instructional Modalities

Synchronous = All types of learning in which learner(s) and instructor(s) are in the same place, at the same time, in order for learning to take place. This includes in-person classes, live online meetings when the whole class or smaller groups get together. In synchronous learning, students usually go through the learning path together, accompanied by their instructor who is able to provide support while students are completing tasks and activities.

Asynchronous = A student-centered teaching method widely used in online learning. Its basic premise is that learning can occur in different times and spaces particular to each learner, as opposed to synchronous learning at a same time and place with groups of learners and their instructor, or one learner and their instructor. In asynchronous learning, instructors usually set up a learning path, which students engage with at their own pace.

Blended = An approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both teacher and student, with some elements of student control over time, place, path, or pace.

Flipped = An instructional strategy and a type of blended learning, which aims to increase student engagement and learning by having students complete readings at their home and work on live problem-solving during class time.

Hybrid = An educational model where some students attend class in-person, while others join the class virtually from home. Educators teach remote and in-person students at the same time using tools like video conferencing hardware and software.

Hyflex = A course design model that presents the components of hybrid learning in a flexible course structure that gives students the option of attending sessions in the classroom, participating online, or doing both. Students can change their mode of attendance weekly or by topic, according to need or preference.

Course Management Systems

D2L Brightspace

D2L Brightspace is MSU's primary Learning Management System (LMS). It has built in content management, classlist, communication, discussion board, survey, quiz, assignment, gradebook, and group management tools. It has integrations with most other MSU supported tools, including Zoom, Mediaspace, Packback, Crowdmark, Gradescope, and iClicker. It is equipped with Spartan A11y, a built-in accessibility checking tool. The Assignments tool is integrated with TurnItIn for plagiarism checking of essays. The Quizzes feature is integrated with Respondus Lockdown Browser and Respondus Monitor for quiz/exam proctoring.

MS Teams

MS Teams is not a full LMS, but it can be used as a course management system. A Team for a course can be requested through MSU D2L Apps. A course Team is similar to a regular Team except the General channel includes more tabs: OneNote Class Notebook, Assignments, and Grades. Assignments can be document-based or quizzes created in Microsoft Forms. Files of any type can be shared with students from the Files tab and Teams meetings, rather than Zoom, can be used for synchronous video sessions. Note, however, that a course Team is not actually connected to a D2L course and there is no grade sync between the two platforms.

LON-CAPA

LON-CAPA is a free and open-source learning management system created by Michigan State University in 1992. It is hosted by the Department of Physics and Astronomy and the academic group offers one-on-one and departmental training free of charge. LON-CAPA includes all the standard features of learning management systems, uses NetIDs for login, and provides better functionalities for science and mathematics assessments. Content from other systems, as well as textbook publisher content, can also be imported into LON-CAPA.

Google Classroom

Google Classroom is a course management system particularly useful for courses open to learners who do not have an MSU NetID. It is most powerful if you utilize other Google Apps (such as Drive, Calendar, Groups, Meet). It doesn't allow for creation of D2L-style HTML content pages, but content can be created in Google Docs, Slides, etc. and links posted to the course. It is particularly good at iterative assignments and live feedback within Docs or Slides, since it is very easy to track version history, add comments, suggestions, and more. Assignments can be submitted, graded, re-submitted, and appended with additional documents. Video management can still be done using Mediaspace for security and meetings done through Zoom or Teams by posting links. Note that, like Zoom, Google apps are geoblocked in many countries.

Tech for Activities * Modalities

Exams & Assignments

Administer & Grade

Online exams, or online versions of in-person exams, can be created, administered, and graded in **D2L Quizzes**, **D2L Assignments**, **Crowdmark**, **Gradescope**, and **DigitalDesk**.

The **D2L Quizzes** tool is native to the D2L LMS. It supports auto-graded multiple choice, multiple select, true/false, fill-in-the-blank, matching, and ordering questions. It supports essay questions as well, but these cannot be auto-graded.

The **D2L Assignments** tool could be used to distribute exam questions or a formatted paper-style exam for students to submit their answers as a file (e.g., Word doc, Powerpoint, pdf, image, etc.). Similarly, **Crowdmark** and **Gradescope** support distributing and grading paper-based exams. Instructors provide exam templates or question lists. Students can print out the templates and write their answers in the available space, or write out their answers free-form on a page, then scan and upload their pages, indicating to the platform where each question is answered within the scanned pages. In all three tools, instructors grade the exams within the platform and the grades can be synced to the D2L Gradebook.

DigitalDesk is a comprehensive assessments platform that provides a seamless pathway between paper/pencil, scan based, and online testing. Test Builder includes item banking, rich content and integrated proctoring options. Rubric Creator facilitates instructors' scoring of essays and portfolio submissions. Reporting features include exam analysis, on-demand score reports and automatic reporting. Customizable reports can be emailed whenever students submit assignments or complete exams, or at designated times such as at the end of the semester.

Proctor

D2L quizzes and exams can be asynchronously proctored using **Respondus Lockdown Browser** & **Respondus Monitor**. Note that the Lockdown Browser does not work for students who need to use a screen reader. Respondus Monitor also does not work on all devices (particularly Google Chromebooks and iPads) without additional steps and settings, where available to remediate such issues. Respondus Monitor requires the use of a webcam and microphone to record students taking the exam. An AI reviews the recording to identify behaviors that it thinks indicate cheating and flags those parts of those videos for instructor review. It has known irregularities in facial detection that can cause unexpected and last-minute issues for students trying to access the exam, consuming time for exams given in very strict time windows or durations. Students must be informed in the syllabus if a webcam is required for assessments, as MSU students are only expected to have a laptop or desktop but they are not required to have a webcam. **DigitalDesk** also offers a proctoring service for exams given in its platform.

Exams can be proctored in small groups using synchronous video meetings in **Zoom**, **MS Teams**, and **Google Meet**. With these applications, a live instructor must watch the students taking the exams, limiting the number of students that can be proctored at a time, unless proctors are available to monitor additional groups in other meetings or in breakout rooms.

Quizzes, Polls, & Surveys

Synchronous and/or Asynchronous

D2L Quizzes are most often asynchronous, but can be made essentially synchronous by making them available for a very limited window of time. Some instructors gave in-class D2L quizzes during the pandemic by starting their synchronous Zoom meetings, then making their quizzes available during class time.

DigitalDesk, **Crowdmark,** and **Gradescope** can be used to administer and grade online, auto-graded quizzes. Like D2L quizzes, these can be made synchronous by strict timing of availability. These tools can be used to administer and grade scans of paper quizzes/homework just as described for Exams.

iClicker can be used for synchronous (in-person or online) quizzes and surveys using either iClicker remotes or the iClicker Student app. The iClicker Student/Cloud software supports several different question types, including multiple choice, multiple select, short answer, hotspot, etc (in the Student app; the iClicker remote does not support more advanced question types). Note that iClicker Student works by sending an image of the instructor's screen to the students' phones, which may not be the most accessible option for visually impaired students.

Zoom polls can be used to synchronously survey students during a Zoom meeting. Polls can be multiple choice or multiple select. The polls feature has been updated recently with "Advanced Polls" with additional question types, added images, and the ability to make quizzes with designated correct answers. Polls can be added in advance by the meeting creator or in-meeting by a meeting host. Questions and answers cannot be re-ordered, so they must be written in the order that the host wants them to be asked. Polls are conserved across all instances of a recurring meeting, so polls will have to be created and deleted as desired for each instance. It would be wise to use a consistent and informative poll naming system.

Primarily Asynchronous

Video quizzes can be used as engagement and knowledge checks. Quizzes can be added to videos using **Camtasia** and **Kaltura Mediaspace**. Camtasia quizzes are SCORM packages and as such scores can be tracked and the results sent to the Brightspace D2L gradebook if the SCORM object is set up correctly. Kaltura video quizzes can be tracked in D2L if the video is inserted into a page using "Insert Stuff" > "My Media" (there is no tracking if the video is inserted by pasting the embed code). Kaltura quizzes can also be tracked in Mediaspace if the video privacy settings require NetID sign-in (e.g., private + "published" in a restricted channel). The

integration of Kaltura video quizzes for sending grades to the D2L gradebook is extremely particular as well. Look for documentation on this integration in the D2L self-enrollment course MSU Tools & Technologies.

Microsoft Forms and **Google Forms** can be used for quizzes in any class, though they are far better suited for surveys in courses not using Teams or Google Classroom. Outside of a Teams class or Google Classroom, MS Forms can be given an automatic end date, but Google Forms must be manually closed to accepting new submissions. Within an MS Teams class, MS Forms is the integrated quiz and survey tool. Likewise, Google Classroom uses Google Forms for quiz assignments and integrated surveys. Within their respective course management systems, both Forms can be given due dates, have automatic grading, and other typical quiz features.

Qualtrics can be used for creating surveys at MSU. There are a LOT of question types and many ways to customize the response options (e.g., visual representations of response levels, slider bars, matrices, image hotspots, etc.). Some of the more image-dependent questions and customizations can become inaccessible to visually impaired respondents. Learn more about Qualtrics and accessibility here:

- Accessibility Guidance for Survey Creators
- Qualtrics Survey Accessibility Tool

D2L Surveys is a built-in tool to monitor current course trends, seek opinions, and assess user satisfaction. Surveys are an excellent way to solicit feedback from participants regarding any aspect of a course. For example, use surveys as a method of collecting course evaluations, mid-year reviews, or researching people's learning styles and content delivery preferences. The editable, single attempt option can cause issues with not recording an attempt if they open the survey again without submitting. It's best to limit D2L surveys to one attempt.

D2L Self-Assessments is a tool that enables you to provide students with a series of questions and immediate feedback for responses. Question types available are similar to quizzes, however, student responses are not graded and self assessment questions do not have a points value or difficulty level indication. The omission of numeric evaluation enables students to make reflective learning and course material comprehension their main priorities during a self assessment. This Brightspace Community article has a table comparing D2L Quizzes, Surveys, and Self-Assessments to help decide which tool is the most appropriate for your purpose.

Creative Projects

Essays

Assigning essays can provide students with an opportunity to apply course material in ways that require less proctoring and encourage creativity. Tools like **Google Docs** and **Eli Review** provide opportunities for students to work collaboratively and offer peer feedback. Eli Review is also a good alternative for peer review for students that reside in countries with restricted access to Google Apps. For instructors, **TurnItIn** is also a useful tool for grading and providing

feedback, especially with its integration with D2L's assignment tool and gradebook. When assigning essays, issues of plagiarism (whether intentional or not) may arise. Since TurnItIn retains student work to inform future plagiarism detection, this specific syllabus statement **must** be included in the term that TurnItIn is used.

iThenticate offers a chance for graduate students and instructors to check professional writing (dissertations, manuscripts for publication, etc.) for authenticity. It should ***not*** be used for course essay projects.

Websites

Creating websites for individual student portfolios or instructor class hosting can be done using **Google Sites**. Weebly, Wordpress, and other free website creation platforms are not supported by MSU. Note that FERPA restrictions mean that websites built for a specific course or courses should not be required to mention the course for which it was created, since that constitutes an educational record. **Microsoft Sway** can be used to develop innovative presentations that can be added to a website.

Videos

Students and faculty can use **Camtasia**, **Kaltura Capture**, **Powerpoint**, and **Zoom** to capture videos for class.

Camtasia and **Kaltura Mediaspace** can be used to edit videos from any of those sources. Kaltura Mediaspace has limited options and can be laggy in processing changes. It is best used for simple trimming or cutting sections, adding "chapter" markers to longer videos, adding hotspots, captions and video quiz questions. Any advanced video editing (noise reduction/ equalization, hard-coded annotations, internal clipping, stitching, added audio tracks, etc.) should be done in Camtasia. Some Camtasia video editing features are only available if Camtasia was used to record the video (e.g., modifying the mouse size and halo). Captions, quizzes, and hotspots are much easier to add, use, and track in Kaltura Mediaspace than in Camtasia, *especially* for adding the final video to D2L, because Camtasia requires its own smart player for these features to work properly. It is much harder to add the Camtasia smart player to D2L than to insert a Mediaspace video.

Auto-generated captions can be requested in Kaltura or created automatically in Zoom meetings that are cloud recorded. They are generally ~90% accurate, depending on the audio clarity, quality, and frequency of technical terms used (e.g., D2L frequently becomes D twelve), so proofreading is critical to ensuring that the captions actually meet the needs for which they were created. Learn more about captioning and paid proofreading services in the MSU Tools & Technologies course. Camtasia does not have the ability to automatically caption videos, but once captions are added manually, they can be edited and customized in the Camtasia interface. If you download Kaltura or Zoom auto-generated captions for adding to an edited video in Camtasia, you will first need to convert the file type from VTT to SRT. Also note that captions in a Camtasia video are hard-coded into the video (not an optional, separate layer that

can be turned on/off) unless the video is played in the Camtasia smart player, which can be tedious to add to D2L.

Powerpoint can be used to record lecture videos or student presentations, with the advantage of being able to record each slide individually and export a single continuous recording. The recording is a video file of the slides and your webcam on PCs, but slides and audio only on Macs. Powerpoint also has the option for voice-to-text for creating captions in video recordings, but note that these captions are “hard-coded” into the video and cannot be turned on/off as a layer over the video like in Kaltura.

Instructors and students can start single-person **Zoom** meetings to record lectures or presentations. If you use cloud recording and auto-transcription, Zoom will generate captions and send the video and captions directly to Mediaspace, which saves a lot of time compared to locally recording, uploading to Mediaspace, and then having Kaltura generate captions.

NOTE about recording students: If you record synchronous class sessions or require your students to record themselves, ensure that the videos are FERPA compliant if you plan to make them public. You will need to blur or remove all webcams, images, and names of students as well as distort or remove all student voices from the video, unless all students in the video have given prior written consent. Otherwise, you must restrict access to the video and only allow currently registered students in the course to view it. This can be accomplished by keeping the video Private on Mediaspace and inserting it on a page in D2L, adding it to a Course Media Gallery in D2L, or adding it to a private channel on Mediaspace (to which you have also added your students as members). The syllabus for the course also needs to include a statement that synchronous sessions will be recorded. For more complete instructions on keeping recordings of students private and FERPA compliant, see the Kaltura Mediaspace and Zoom modules in the MSU Tools & Technologies course.

Infographics/Images

SnagIt is a versatile and easy to use screen capturing and subsequent image editing tool for faculty and students. Images can be imported if collected from other sources. The timeline feature is particularly useful for keeping track of images captured sequentially without needing to paste screenshots into another program to prevent clipboard overwrite. Moreover, SnagIt has the ability to capture a single continuous image of a scrolled window, precluding the need to capture and stitch together discrete images in order to capture a long image in high resolution. SnagIt can also be used to record your screen or make GIFs.

Online Discussion Forums

Instructors have several options for incorporating discussion into their courses. This can be done through **D2L Discussions**, which can be easily scored and linked to your D2L Gradebook. **PackBack** uses a Curiosity Score to encourage students to write more credible, open-ended questions and responses. Like PackBack, **Piazza** is also student-driven. This platform allows for

wiki-style questions and answers. **Flipgrid** allows students to participate in discussions by posting their responses to different topics in video form. While PackBack, Piazza, and Flipgrid can be embedded in D2L courses for easier student access, grading student responses within these platforms needs to be done locally and imported into your D2L Gradebook.

Online Synchronous Meetings/Conversations

When it comes to video conferencing, both **Zoom** and **Microsoft Teams** offer a variety of features that are useful for instruction such as screen-sharing, chat, and whiteboard. While these platforms can be downloaded as applications, they are also accessible via web browsers. Microsoft Teams also integrates other applications within Office 365, such as Word, Excel, Outlook, and PowerPoint.

If you are using Google Classroom, **Google Meet** and Google Groups are available and seamlessly integrated. Groups can be used for group collaboration and also as a Teams-style chat area for students to communicate, share materials, and start instant Google Meet sessions for group members. Google Meet recently added breakout room functionality to *some* versions of Google Workspace. The version to which MSU subscribed does not have breakout rooms at this time.

Google Calendar and **Microsoft Bookings** offer easy ways for students to sign up for Office Hours or presentation time slots that will take place via Zoom or Teams. Google Calendar has an appointment slot feature built-in, while a Bookings calendar must be requested first and takes longer to set up, but also offers more functionalities such as allowing students to book with TAs. Both tools create dedicated pages that you share with students and they simply click on a time slot to reserve it.

Group Collaboration

Group work is significantly improved by using inherently collaborative document systems, such as **Google Drive** or **Microsoft OneDrive**, whether the work is done synchronously or asynchronously.

The **Google Workspace** was recently updated to allow Google apps to natively edit Microsoft documents. So, if you upload a Microsoft Word document or Powerpoint slide deck to Google Drive, you can edit those documents in the associated Google Apps and it will save and be ready for download as a Microsoft document, rather than creating a separate Google version of the document.

For synchronous online group work, e.g. formulating written answers or drawings during a class, Google is often superior at managing high numbers of simultaneous users. It is also much easier to check the version history to see individual contributions in Google files than in Microsoft.

If you are using **Teams** as your LMS, there is a significant advantage to using OneDrive, since they are highly integrated in the Office 365 Suite.

Peer Review

Eli Review is a web-based peer review application created right here at Michigan State University. It provides an easy platform for students to review each other's work and provide feedback. Instructors set up the writing assignments, focusing on small, targeted assessments, that can lead to larger, more complicated, works.

CATME (Comprehensive Assessment of Team Member Effectiveness) is a web-based tool that can be used to create more effective teams. There are two main tools within CATME that can be used to enhance teamwork and group projects: the CATME Team-Maker Survey and the CATME Peer Evaluation Survey. These pedagogical tools can be used to create more compatible teams based on demographic data and to gather feedback on student's experience working in teams.

Virtual Lab

Software Labs (e.g., ArcGIS, Matlab, etc.)

The **Virtual Desktop Infrastructure** (VDI) service at MSU allows faculty, staff, and students to access licensed university software through an online portal. Faculty or departments must request access to a Virtual Desktop for a course or for graduate student use. Once access is granted, simply login at vdi.msu.edu with your MSU NetID. University licensed software available through VDI includes applications such as ArcGIS, AutoDesk, IBM ILOG, MatLab, PyCharm, R Studio, SAP, SAS, SPSS, Stata, and Vectorworks.