**E-Learning Technologies**

The phrase “e-learning technology” describes technology-based products used to manage educational content. In this context, content management can refer to any of the following capability areas

1. Infrastructure for storing, cataloging, and accessing content
2. Methods for capturing, sharing, presenting, and deploying content
3. Processes to integrate content – either between individuals, between e-learning technologies, or both

Although many examples of hardware-based e-learning technologies exist, most are delivered as online services via cloud-based software applications. When compared to the use of hardware tools, cloud-based delivery can lower the costs associated with providing e-learning services. However, cloud-based delivery has also accelerated the pace at which e-learning technologies become obsolete and replaced by newer technologies. As result, the number of e-learning technologies has increased rapidly as companies work to quickly develop tools to fill various educational needs.

Because of this rapid growth, the process of selecting a service can be difficult as it involves identifying which features are important today while simultaneously trying to predict what features will be important in the future as newer services are made available with improved features. Therefore, the following recommendations focus on implementing the ‘must have’ e-learning technologies as identified by multiple Ohio universities during on-site visits by the QIP external subcommittee. These recommended technologies include: (1) cloud-based file sharing and collaboration tools, (2) cloud-based communication tools, (3) tools for accessing, sharing, and re-using video content, and (4) tools to create and share non-video content across classes.

**I. Tools for Cloud-based File Sharing and Collaboration**

Cloud based file sharing (CBFS) is a service wherein individuals, with appropriate permissions, can access, edit, upload, or download files. CBFS facilitates easier collaboration on documents and presentations as the files can remain in a single location that can be accessed from anywhere in the world. Many CBFS services also help maintain version control for files and allow many users to edit documents simultaneously.

The QIP external committee asked the representatives from each school with whom we met “If you were forced to give up all but one e-learning technology – which would you keep”. Each school responded that their CBFS service was the most important e-learning technology. A common response was that not having a CBFS service would have a significant negative effect on the ability of their faculty to collaborate both internally and with other institutions.

*I.A. Examples from Outside Organizations*

The most commonly used tools of this type are: [Dropbox Business](https://www.dropbox.com/business), [Box Enterprise](https://www.box.com/security/governance-and-compliance), [OneDrive for Business](https://onedrive.live.com/about/en-us/business/), and [Google Drive](https://www.google.com/drive/). Examples of universities using these tools are listed below, note that many universities (private and public) offer more than one of these tools. Finally, as Dropbox Business is a newer offering, relatively few examples of universities using this service are available. As result, Dropbox Business is not included in the list below.

* **Box Enterprise** – Ohio State, Miami (FL), Indiana, Illinois, Stanford, Cincinnati, Texas-Austin
* **OneDrive for Business** – Miami (FL), Auburn, Alabama-Birmingham, Wright State, Texas Tech, Harvard, UMASS
* **Google Drive** – Michigan, Western Michigan, Miami (FL), Syracuse, Minnesota, Dayton, Texas A&M, Harvard, MIT

From discussions with representatives at each school visited by the QIP external subcommittee, the choice of CBFS service providers was determined primarily by the answers to two questions:

1. Which service’s security features are sufficient for our institution’s needs?
2. How well will the service integrate with our LMS or other tools we already provide?

*I.B. Pros and Cons*

Pros:

* Better collaboration between faculty and distance students
* Continued collaboration with students who have already graduated and PCS’d
* Easier access to files while TDY (sending web links to files instead of file paths on a local shared drive that often can’t be accessed when not in the office)

Cons:

* Explain hurdles to pursuing recommendation (e.g. financial constraints, length of time, authority we would need to get, etc). Make sure to address *scope*, *impact*, and *cost* in this section

**II. Tools to Organize Communications**

Many organizations have adopted tools that aggregate, or channel, communication activities around ‘teams’. In this context of AFIT, a team might be the entire organization, a department, a research group, a committee, or simply a group of individuals collaborating to reach some decision. Channeled communication has become very popular because it allows users to focus on their most important communication channels. By contrast, email consolidates all communication in an inbox, forcing users to respond to every notification to determine if it is important.

Channeled communication tools can also be configured such that certain communication channels constrain activity to within an organization while other channels allow members from outside organizations. Further, many channeled communication tools integrate with other tools and services to provide a richer functionality. For example, faculty can quickly discover who has expertise in a certain research area and then invite them to join a channel focused on discussing efforts in that area. As another example, many channeled communication tools can integrate with Office 365 such that team members can create and collaborate on Office documents in real time. Finally, channeled communications can help leadership emphasize certain stories and events to specific teams.

*II.A. Examples of from Outside Organizations*

The most commonly used tools of this type are: [Slack](https://slack.com), [Microsoft Teams](https://products.office.com/en-US/microsoft-teams/group-chat-software), [Zoom](https://zoom.us/), [Google+,](https://plus.google.com/) and [Skype for Business](https://www.skype.com/en/business/skype-for-business/). Examples of universities using these tools are listed below. Note (1) Microsoft Teams is a new offering and has not yet been approved for use in the MS Office Suite used by government organizations, therefore is it not included in the list. Note (2) Google+ is available as a subscription service for individuals and for organizations. However organization subscriptions only come with a subscription to G Suite. As AFIT has chosen to use Canvas as its LMS, and not G Suite, Google+ is not included on the list of tools below.

* **Slack**
* **Zoom**
* **Skype**

*II.B. Pros and Cons*

Pros:

* Can integrate voice, text, video, images, and files into every communication stream
* Communications can be archived and searched (by channel or across many channels)
* Customize notification settings for any communication channel: you can turn off notifications for noisy channels and still keep them on for others

Cons:

* Can result in many communication “channels” to organize.
* Ensuring security communications and integrations could be a lengthy process
* Training AFIT faculty & staff to use a new communication paradigm could be challenging

**III. Tools to access, edit, and re-use existing video content**

As a body, the AFIT faculty have created a large volume of video content for teaching various topics to both in-resident and non-resident students. When instructors develop new courses, or update existing ones, having access to existing video content could make the process faster. Tools have been developed for storing and cataloging video content so that it can be easily accessed and utilized by many instructors across multiple courses. As example, many AFIT courses include math content presented by ENC as part of the refresher videos provided to new students. Having an accessible repository of video content could reduce the amount of time spent revamping courses.

Several products exist to make the process of creating, uploading, editing, and cataloging video content much easier. Some of these products can be used to construct overlays to the videos, making them interactive. As example, allowing students to make persistent annotations directly on the video such that instructors and students can review previous comments. Finally, many of these products provide dashboards presenting data analytics on which have viewed an assigned video, the points within the video where students spent the most time, and any comments the students had about ideas that they found to be confusing.

*III.A. Examples from Outside Organizations*

The most commonly used tools of this type are: [Sharestream](https://www.sharestream.com), [Panopto](https://www.panopto.com/panopto-for-education/lecture-capture/), [Mediasite](http://www.sonicfoundry.com/mediasite), and [Kaltura](http://corp.kaltura.com/Video-Solutions/Teaching-and-Learning). Examples of universities using these tools are listed below.

* **Sharestream –** Georgetown, Iowa, Eastern Washington, Texas A&M, Maryland, North Florida, Lewis University, Tulane, Georgia State
* **Panopto** – Kettering, Michigan, Ohio University, Utah, LSU, Auburn, Rochester, Texas A&M, Washington, Emory, Cornell, Yale, Johns Hopkins, USC, George Washington, Illinois, Virginia, Virginia Tech, Miami, Boston College, Baylor, Akron, Oregon, Brown, Pepperdine**,** Arizona, Tennessee, BYU, Hong Kong, Stanford, Oxford, Columbia, Iowa, Cal-Berkley, Minnesota State, NYU, William & Mary
* **Mediasite** – California State University System (23 Campuses), Ohio State, Northwestern, Arizona State, Clarion University, Duke, Villanova, Syracuse, Houston, Colorado, Carnegie-Mellon
* **Kaltura** – Alaska, Georgia Sourthern, Oregon State, Illinois, Miami, UCONN

*III.B. Pros and Cons*

Pros:

* Integration with closed captioning services
* Dashboards provide insight to see which videos students watch, how long they watch, and when they stop watching
* Create a campus video portal or “AFIT YouTube”

Cons:

* Some products require videos to be uploaded to their servers
* From certain products, access to videos is dependent on network reliability
* Security Make sure to address *scope*, *impact*, and *cost* in this section

**IV. Tools to create and share content across classes**

Introduce the recommendation in 1- 2 paragraphs. Explain the Idea, technology, process, etc. you’re recommending. Explain why this idea fits in your thrust area. List other thrust areas that would overlap with this recommendation.

*IV.A. Examples from Outside Organizations*

Give examples from outside organizations in 1-3 paragraphs. Links and citations are useful. Pictures or figures should go in this section. Please no more than one per recommendation.

*IV.B. Pros and Cons*

Pros:

* Reduced duplication as communication does not need to be “sent” to everyone involved
* Communication can be organized by “channels” centered around specific interest areas or decisions
* Can integrate voice, text, video, images, and files into every communication stream
* Communication streams can be stored and searched (students can learn from previous classes)
* Easy to integrate new members to the communication stream

Cons:

* Explain hurdles to pursuing recommendation (e.g. financial constraints, length of time, authority we would need to get, etc). Make sure to address *scope*, *impact*, and *cost* in this section

Several trends have emerged with respect to education delivery and are driving the development of newer e-learning technologies. Of the most commonly cited trends, those like to have the greatest impact on technical education are listed below.

* **Distance is becoming less important** – e-learning technologies will drive the creation of new content toward a “distance first” mindset. The idea being that if a student 1000 miles away can learn using an instructor’s course content – so can a student 5 feet away.

* **Integration of data analytics** – A major driving force behind developing future course content will be the ability to integrate assessments that feed data back to instructor. This data can then be used use identify which students are struggling or how the content could be presented more clearly. Finally, data will also be used to alter the rate at which new ideas are introduced if students are struggling – essentially a choose your own adventure course.
* **Microlearning** – AFIT has already created several certificate programs that fall in-line with this trend of delivering smaller packages of focused content. This will continue as users want to learn about specific concepts without necessarily going through a full course. Most courses can already be thought of as a set of modules delivered in a particular sequence. Microlearning is the idea that students can enter a course at a specific module, rather than just at the beginning.
* **Interdisciplinary learning** – Traditionally, most courses present engineering or mathematical concepts and may provide short tutorial on how to use a computer program to implement the methods. To learn more advanced programming skills, students would take another course and then try to merge what they had learned. This connection will become tighter.
* As a final note, I recently attended a talk at the world’s largest education technology conference where the IT leaders from the California university system provided insights on delivering cloud-based tools to their respective schools. During the talk the presenters polled the eighty or so attendees on what types of cloud based tools were available at their school. For the last question, the presenters asked attendees to raise their hand if their school provided no cloud based tools. It was very instructive to see AFIT was the only school represented at this talk for which this was the case.