

## Online and Blended Learning Best Practices

### Mission

To synthesize online and blended learning teaching best practices to improve the continued use of technology in the classroom.

### Executive Summary

This past spring, the University rapidly adapted to online learning amidst a global crisis. While the scale and speed of this transition were unprecedented, students and professors alike navigated new uses of technology in the classroom.

In order to build upon lessons learned from this past semester and offer suggestions for continuing to enhance the quality of a Wharton education in the future, the Wharton Dean's Undergraduate Advisory Board (WAB) consolidated research on online and blended learning. Blended learning is defined as a combination of face-to-face instruction with distance education delivery systems.<sup>1</sup> WAB also gathered student feedback on the online learning experience this past semester. This paper aims to provide resources and research to support the implementation of effective elements of blended and remote learning.

The first section of this paper summarizes recommendations. Next, the paper includes an online learning section complete with peer benchmarking, best practices and recommendations, and a world bank report on online learning in the context of COVID-19. A blended learning section details blended learning best practices, active learning best practices, and university guides to blended learning by peer institutions. The paper concludes with an analysis of a WAB survey with N=53 responses.

This paper includes work from two prior WAB white papers, an online learning best practices paper and an active learning paper. The final section of this paper considers takeaways from a survey WAB conducted. WAB synthesized key takeaways from this paper into an abbreviated version. For the complete version of the online learning best practices or active learning paper, access to the full survey results, or the abbreviated version of this paper, please contact [deansboard@wharton.upenn.edu](mailto:deansboard@wharton.upenn.edu).

### Recommendations

The following recommendations are synthesized best practices. While nearly all recommendations apply to both online and blended learning, recommendations that mainly apply to blended learning are marked with an asterisk (\*):

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<sup>1</sup> McCown, Linda J. *Blended Courses: the Best of Online and Traditional Formats*. Clinical Laboratory Science, Volume 23 (4), 2010.

## **A. Online & Blended\* Learning Recommendations**

### **• *Class Structure***

- Break lectures into concept-based intervals that reinforce active learning and are engaging visually.
- Utilize live discussions, as they are an effective way to engage students. This can be done through breakout rooms and other techniques to encourage participation.
- Asynchronous discussion can facilitate regular student engagement with course material. Use a platform such as Piazza to allow students to ask questions and receive feedback.
- Consider using various forms of virtual discussions, such as video or text uploads. These discussions are most effective with open-ended questions and follow up questions that encourage students to think critically about course topics.
- \*Utilize active or flipped learning in blended classrooms to help students better understand content and promote greater long-term retention. Steps for a successful flipped learning course include the following:
  - Students learn basic concepts from recorded videos that cover smaller learning objectives. They could be tested on this knowledge through an assignment or quiz to ensure accountability.
  - Students come to class with a baseline understanding of the material, which is briefly summarized through a lecture in the first portion of class.
  - A significant portion of class could be devoted to reinforcing larger and smaller concepts through problem sets, case studies, and project-based learning.
  - The final part of class would involve splitting students up into groups to work on a cumulative project or additional problem sets. Students can also discuss concepts that may be confusing to them, further allowing for active learning.
- \*Since communication is of utmost importance in an online classroom, set clear expectations for desired information. For instance, bucketing different content into “Big Ideas” then breaking those down into smaller learning objectives gives students bite-sized information they can absorb, while allowing professors to precisely assess these concepts.
- \*Use learner-centered principles to guide the design of the class.

### **• *Classroom Community and Communication***

- Building a sense of community in an online setting is an important aspect of remote learning. This can be done through office hours, forming study groups, and facilitating small group discussions. Additionally, offering office hours by appointment can help accommodate students in different time zones and reach a wide audience of students.
- Providing opportunities for students to work in groups or using a dynamic chat tool allows students to immerse themselves in the content and builds classroom community.
- Open feedback systems between professors and students can help professors improve the quality of the course and students better engage with the course content. We recommend that professors collect feedback as early as possible and remind students of the feedback form regularly. Professors can consider including the following questions:
  - What’s working so far?
  - How could your learning experience be improved?
  - What do you want or need help with?

- Streamline communication and assignment instructions by using rubrics with clear expectations, communicating a timeline for work that should be done, and reminding students of available resources.
- Providing opportunities for students to work in groups or using a dynamic chat tool allows students to engage with the content and builds classroom community.
- **Assessments**
  - Encourage academic integrity and consider alternatives such as open book exams or team based learning to discourage cheating.
  - Group projects with a peer evaluation component can be an effective way to assess students. Projects allow students to demonstrate and apply their knowledge. Group projects can increase accountability, especially when students are responsible for reporting on or maintaining the integrity of the project as a whole.
  - Low-stake testing structures remove the focus on the final exam and reduce the effects of cheating.
  - Criterion-Based Grading is the most effective grading structure for active learning, but it can be used for all class structures. Criterion-Based Grading grades students on their ability to meet learning objectives, independent of their performance relative to their peers. Group learning objectives can be used to incentivize group work.
  - The transition to online learning raises equity concerns for many students, including students with different levels of access to resources and learning disabilities. Consider designing online courses with these equity concerns in mind. There should also be a way for students to raise these concerns with their professors to develop solutions and utilize existing campus resources.
- **Technology**
  - Collect feedback on students' technological problems. This can be done by creating a separate forum for students to ask technological questions or publish a Frequently Asked Questions page on Canvas.
  - Ensure that course materials are accessible.
  - \*Professors should be mindful of student proficiency with the technology that is available. For example, some students especially struggle with digital texts.
- **School-Wide Policies**
  - Communicate and centralize program-wide standards to alleviate concerns on course design.
  - Offer synchronous classes and record these classes to provide an alternative for students unable to attend due to time zones and other issues.
  - Professors and students can better navigate rapid changes when there are guides on effective online learning, resources and policies are shared in a centralized location, and students are directed to these resources regularly.
  - Transitioning to online learning is far from easy. In order to best utilize technology in the classroom in the future, it is critical that professors have access to training and resources.

- Given lessons learned from rapidly adapting to online learning and evidence that suggests institutions were able to adapt with a greater success rate where online learning was already practiced, it would be beneficial to prepare an infrastructure for future adaptivity to online learning. For example, professors could save recorded lectures and resources and share these as educational resources in the future.

## **B. Survey Takeaways**

- Both live and pre-recorded lectures had high levels of satisfaction online. Lectures can be transferred to an online setting successfully.
- Students overall were dissatisfied with their ability to connect with other students. Using breakout rooms or team projects can encourage interaction and community.
- Students are concerned about cheating and mentioned examples of their classmates collaborating during exams, using notes and resources on exams, and lying about circumstances. Professors should consider steps to mitigate these concerns (i.e. making exams open-book or allowing collaboration in some capacity)
- Students overall found value in recorded lectures and recitations as well as interactive, live communication. In particular, live polls and Q&A were effective. Furthermore, live discussions outperformed discussion forums.
- 73% of students in different time zones found it somewhat difficult to learn online. Time zones should be taken into account when designing courses and assigning group work online.

## **Table of Contents**

<b>Executive Summary</b>	<b>1</b>
<b>Recommendations</b>	<b>1</b>
<b>Table of Contents</b>	<b>5</b>
<b>Part I: Online Learning</b>	<b>6</b>
Benchmarking	<b>6</b>
Best Practices and Recommendations	<b>8</b>
World Bank Suggestions on Online Learning in the Context of COVID-19	<b>13</b>
<b>Part II: Blended Learning</b>	<b>16</b>
Blended Learning Best Practices	<b>16</b>
Active Learning Best Practices	<b>18</b>
University Guides to Blended Learning	<b>19</b>
<b>Part III: Survey Data and Analysis</b>	<b>22</b>
<b>Works Cited</b>	<b>25</b>

## **Part I: Online Learning**

Various peer institutions made decisions on academic policy and offered resources for online learning. These findings and key trends found through benchmarking are detailed in this section.

In March, WAB combined resources and research on online learning best practices given the rapid transition to online learning. These recommendations and research are included to inform best practices of online learning.

Since then, new research, particularly research done by the EdTech team at the World Bank, has further studied online learning in the context of COVID-19 and the unprecedented scale and speed of the transition to online learning.

### **Benchmarking**

#### **A. Policy Benchmarking**

In response to the sudden changes that took place in the 2020 Spring Semester, many peer institutions to the Wharton School and the University of Pennsylvania handled their grading, class, and exam structures differently. Furthermore, there were numerous approaches to providing students with information, resources, and advice relevant to transitioning to virtual learning.

- ***Grading Structures***
  - Regarding grading policies, the vast majority of schools were split between Universal Pass/Fail grading (e.g., MIT did not allow students to take courses for letter grades) or Opt-In Pass/Fail (e.g., Brown let students choose between P/F or letter grades). The schools that chose Opt-In P/F largely chose to push the deadline for decisions to the last day of class and allowed a Pass to count for requirements they typically would not qualify for.
  
- ***Class Structures***
  - For class structures, the majority of schools prioritized synchronous classes, but encouraged - or mandated - that classes be recorded for students in time zones that make attending lectures at normal times difficult. The combination of these practices was the most popular option amongst peer institutions, as it enables students to access lecture materials whenever it was most convenient for them. The largest obstacle universities faced regarding their class structures was having to accommodate students living in different time zones.
  
- ***Exam Structures***
  - Very few universities put forward a unified front on exam structure, however, several schools encouraged professors to choose between assigning either asynchronous, open-book exams or monitored synchronous exams. These two options were the most popular choices for exams, as the former mitigated cheating by allowing all students to take advantage of any available resources; the latter option incorporated time limits and monitoring that dissuaded cheating by making it more difficult to complete exams using additional resources in the time provided or without proctors noticing. Brown University

encouraged its professors to consider offering multiple, lower-stake exams or projects to replace their final exams. In a similar gesture, Princeton University suggested that its professors change the grade weights of midterm exams at their discretion to mitigate stress around the final exam. Each of these alternative approaches attempted to remove the focus on the final exam in courses to reduce the effect of cheating and accommodate students who have had trouble adapting to the virtual learning environment and may be disadvantaged when taking exams.

## **B. Resource Benchmarking**

Many schools had similar approaches to distributing information and available resources to students.

### ● ***Information Distribution***

- By far, the most prevalent options for distributing advice and general information around a transition to online learning took the form of a webpage, consistent emailing, or a combination of the two. Every single university possessed some form of website created specifically to respond to questions students may have relating to the status of the university and its decisions during the COVID-19 pandemic, however, many institutions went further and created materials that detailed best practices or tips for students to incorporate into their studies as they adjust to virtual learning. Schools chose to make infographics, Frequently Asked Questions (FAQs) pages, or list valuable resources. Having two distinct websites for COVID-19 and Transitions to Virtual Learning seemed to provide the most comprehensive library of resources for students at the universities that incorporated both (e.g., Carnegie Mellon University).

### ● ***Examples of Peer Resource Best Practices***

- **Brown University** supplied its students and faculty with a [website](#) that contains resources for learning and teaching best practices alongside a revised list of academic policies for the 2020 Spring semester. This was created in addition to a full [COVID-19 website](#) that gave detailed updates on their response to the pandemic.
- **Duke University** provided innumerable updates on the COVID-19 outbreak and their plans for handling it on a consistent basis from January onward on their [response website](#) which kept students informed regarding changes to academics and student-life through the entire outbreak.
- **Yale University** [consolidated a list](#) of all accommodations that students could receive given different circumstances and the ways the students could access them to ease the transition to online learning.
- **University of Michigan** created a [training website](#) that instructs students how to install, set-up, and use a variety of virtual learning resources and gives best practices as to how to transition to online learning. The page is regularly updated and contains information for faculty regarding ways to best engage with students in an online format.
- **Babson College** developed a [virtual campus website](#) that included infographics with technology tips and a comprehensive list of resources students could access to facilitate their transition to online learning in addition to using this website as a central location for IT help, academic policy updates, and a hub to attend virtual events. The website has all the information students could need regarding the university's response to COVID-19

and presents every resource students may use to effectively complete their education for that semester virtually

## Best Practices and Recommendations

A. **Improving Content Retention**: Restructuring the way that lessons are delivered online can improve content retention.

- ***Shorter Lessons***

- In order to maintain student focus and effectively convey all course content online, we recommend that, rather than running full lectures, instructors break their lessons into smaller, seven to ten minute concept-based intervals.<sup>2</sup> This can be done by identifying natural breaks in lecture material, then simply organizing the lecture into smaller “chunks.”

- ***Active Learning***

- To ensure that online instruction reinforces course concepts, we recommend that professors create guided or embedded questions in their lessons. Examples of active learning techniques include worksheets to be completed alongside an online lesson, pauses during video instruction to ask students to answer a question, and low-stakes/non-graded quizzes to allow for students to reflect on how well they retained information.<sup>3</sup>

- ***Visual Stimulation***

- Because online learning relies more heavily on visual communication, we recommend that instructors incorporate visuals, images, and animations into their online lessons. While there is value in allowing students to see their instructor through video, changing visuals that explain the concepts being discussed helps maintain student focus throughout a lecture.<sup>4</sup>

B. **Facilitating Engaging Discussions**: Discussions have been found to increase student participation and build a greater sense of community. Live discussions in the classroom enrich student learning by encouraging engagement with the material through conversations with peers. Discussions held through asynchronous mediums can allow students the opportunity to be more thoughtful, reflective, and consistent in preparation, which contributes to stronger understanding of course concepts and lecture material.<sup>5</sup>

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<sup>2</sup> Glazier, Rebecca A., and Heidi Skurat Harris. *Common Traits of the Best Online and Face-to-Face Classes: Evidence from Student Surveys*. American Political Science Association Teaching and Learning Conference, 7 Feb. 2020, [preprints-apsanet.org/apsa/assets/orp/resource/5e2f9610cd361a001afed294/original/comm-on-traits-of-the-best-online-and-face-to-face-classes-evidence-from-student-surveys.pdf](https://preprints-apsanet.org/apsa/assets/orp/resource/5e2f9610cd361a001afed294/original/comm-on-traits-of-the-best-online-and-face-to-face-classes-evidence-from-student-surveys.pdf).

<sup>3</sup> Moore, Emily A. “Simple Techniques for Applying Active Learning Strategies to Online Course Videos.” *Faculty Focus | Higher Ed Teaching & Learning*, 20 May 2013, [www.facultyfocus.com/articles/teaching-with-technology-articles/from-passive-viewing-to-active-learning-simple-techniques-for-applying-active-learning-strategies-to-online-course-videos/](http://www.facultyfocus.com/articles/teaching-with-technology-articles/from-passive-viewing-to-active-learning-simple-techniques-for-applying-active-learning-strategies-to-online-course-videos/).

<sup>4</sup> Mayer, Richard E. *Multimedia Learning*. Cambridge University Press, 2009.

<sup>5</sup> Lineweaver, Tara T. “Online Discussion Assignments Improve Students' Class Preparation.” *Teaching*



- **Live Discussions**

- Imposing a structure on live discussions allows for a more fruitful learning opportunity. In the virtual learning setting, several tools can be used to guide discussions with the goal of increasing student engagement and maximizing learning.<sup>6</sup>
- Live Discussion Structures:<sup>7</sup>
  - Allot time for structured small group breakout sessions within whole class meetings.
  - Require students to use name tents to facilitate collaboration and communication amongst peers.
  - Create a virtual queue to structure the order of comments and allow all students an equal opportunity to participate in the discussion.

- **Asynchronous Discussions**

- For asynchronous discussions, we recommend using platforms such as Piazza to facilitate regular student engagement in the course, as Piazza allows students to ask questions and receive feedback in a timely manner. Online discussion forums give students more opportunities to interact with one another and the course content, building community virtually.
  - Virtual discussions can take on many forms such as traditional discussions, debates, role-playing, and peer-learning / teaching.<sup>8</sup> These can also be done through video or text uploads on a course site.
- Asynchronous Discussion Forum Best Practices:<sup>9</sup>
  - Ask open-ended questions that allow learners to explore and apply class concepts.
  - Model Socratic-type probing and follow-up questions: "Why do you think that?" "What is your reasoning?" "Is there an alternative strategy?"
  - Ask clarifying questions that encourage students to think about what they know and don't know.
  - Stagger due dates of responses, ask students to write a midpoint summary, and encourage discourse amongst students.
  - Provide guidelines and instructions when asking a student to respond to another student. For example, (1) "Say what you liked or agreed with or what resonated

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*of Psychology*, SAGE Publications, 29 June 2010,  
[journals.sagepub.com/doi/pdf/10.1080/00986283.2010.488546?casa\\_token=cEx-szqxJ-IAAAA%3AJY1nC7F7dPI4W8sSHZQnUOj5B2iomIE27JI5qQnQygyC9dmVJsGgmZz7Pt2MqV9JS929ajQ5c1dBWw](https://journals.sagepub.com/doi/pdf/10.1080/00986283.2010.488546?casa_token=cEx-szqxJ-IAAAA%3AJY1nC7F7dPI4W8sSHZQnUOj5B2iomIE27JI5qQnQygyC9dmVJsGgmZz7Pt2MqV9JS929ajQ5c1dBWw).

<sup>6</sup> Khan, Arshia, et al. "Active Learning: Engaging Students To Maximize Learning In An Online Course." *The Electronic Journal of e-Learning*, Volume 15 (2) 2017, ejel.org.

<sup>7</sup> Yamagata-Lynch, Lisa C. "Blending Online Asynchronous and Synchronous Learning – International Review of Research in Open and Distributed Learning." *International Review of Research in Open and Distributed Learning*, Athabasca University Press (AU Press), 31 Oct. 2019, [www.erudit.org/en/journals/irrodl/1900-v1-n1-irrodl04928/1065292ar/abstract/](http://www.erudit.org/en/journals/irrodl/1900-v1-n1-irrodl04928/1065292ar/abstract/).

<sup>8</sup> Lineweaver, Tara T. "Online Discussion Assignments Improve Students' Class Preparation."

<sup>9</sup> Yamagata-Lynch, Lisa C. "Blending Online Asynchronous and Synchronous Learning – International Review of Research in Open and Distributed Learning."

with you," and (2) "Conclude with a follow-up question such as what you are wondering about or curious about."

- Provide multiple response options to allow students to personalize their learning experience to align with their interests.
- Avoid questions with an obvious yes-or-no response. Specific fact-based questions usually are more effective in automated quizzes or student blogs rather than public discussion forums.

C. **Utilizing Feedback:** Collecting and responding to feedback from students can assist professors in virtual classroom management. Professors can easily implement multiple feedback mechanisms through ongoing feedback online surveys (ex: Google Forms, Qualtrics) linked to the Canvas homepage.

- **Course Content Feedback**<sup>10</sup>

- We recommend that professors collect feedback regarding the course content as early as possible. To help ensure clarity in communication of coursework, professors should consider:
  - Making assignment instructions as concise and clear as possible
  - Distributing rubrics which outline expectations
  - Communicating deadlines multiple times
  - Distributing discussion summaries
  - Providing previews of upcoming assignments
  - Reminding students of available office hours
- The open-ended questions listed below can help professors gather feedback:
  - What's working so far?
  - How could your learning experience be improved?
  - What do you want or need help with?
- It may be effective to remind students of these feedback forms regularly, such as after each lecture or at the end of each week. Such rolling feedback mechanisms can function as virtual suggestion boxes.

- **Technological Feedback**

- Students can also benefit from professors collecting feedback regarding technological problems. This feedback provides an avenue for professors and teaching assistants to understand the roadblocks and challenges students are facing. Professors and teaching assistants can also reactively modify technological components of a course or ideate solutions in response to feedback (ex: switching from Blue Jeans to Zoom). Creating a separate forum for students to ask questions and receive answers to their technological problems, possibly via Piazza, can further promote class engagement. It also may be helpful to publish a Frequently Asked Questions page on Canvas dedicated to solving common technological problems faced by students.

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<sup>10</sup> Boettcher, Judith V., and Rita-Marie Conrad. *The Online Teaching Survival Guide: Simple and Practical Pedagogical Tips*. Wiley, 2016.

**D. Building Class Community:** Wharton prides itself in collaborative learning and classroom communities. With online learning, instructors can take steps to maintain a collaborative environment. For online courses, student satisfaction and the amount students learn are tied to the amount of peer interaction.<sup>11</sup>

- ***Office Hours***

- In digital spaces, students benefit when professors are as accessible as possible. Offering additional office hours or office hours by appointment can help reach a wider audience of students in different time zones. Additional accessibility and timely responsiveness from professors leads to higher student course satisfaction ratings.<sup>12</sup>

- ***Study Groups***

- While students may have formed study groups on campus, many may not have access to those support networks working remotely. To ensure that all students are able to collaborate, we encourage instructors to help students form study groups of four to six students. This can be done by splitting the entire class into groups, or creating online forms for students who want to opt into the support network. These groups will be helpful for identifying resources or clarifying key points of course concepts and class assignments.<sup>13</sup>

- ***Facilitated Small Group Discussions***

- In order to maintain student-professor relationships, it may be effective for instructors to host small group discussions so that students have the opportunity to clarify concepts and talk through misunderstandings.

- ***Resource Accessibility***

- Many courses use required materials that students must obtain to complete assignments. We recommend that instructors ensure that all students have access to these resources and provide contingency plans for students who may need help obtaining them at this time.

**E. Committing to Academic Integrity in Assessments:** In an online learning environment, how students will be assessed and how students ought to be assessed are top of mind for students and professors alike. Reaffirming the university's commitment to creating a learning environment that places an unwavering emphasis on academic integrity will alleviate undue student stress. This commitment should also explain the role all students play in ensuring a fair learning environment for all. This section outlines best practices for upholding academic integrity in virtual assessments (exams and projects) and details responses of peer institutions regarding assessment in an online-learning setting.

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<sup>11</sup> Faja, Silvana. *Collaborative Learning in Online Courses: Exploring Students' Perceptions*. Information Systems Education Journal, 2013, [files.eric.ed.gov/fulltext/EJ1145013.pdf](https://files.eric.ed.gov/fulltext/EJ1145013.pdf).

<sup>12</sup> Boettcher, Judith V., and Rita-Marie Conrad. *The Online Teaching Survival Guide: Simple and Practical Pedagogical Tips*. Wiley, 2016.

<sup>13</sup> Ibid.

- **Testing**

- To show a good faith effort to students, professors can take a number of steps to promote online academic integrity.
- Exam Integrity Best Practices:
  - Consider open-book exams
  - Impose strict time limits
  - Utilize well-populated test banks to enable randomized, yet equitable, exams
  - Use lockdown browser software
  - Conduct video proctoring
  - Outline clear expectations for what material students will be tested on and in what format they will be tested
- Exam Accessibility
  - Best practices for establishing deadlines for an online learning setting include creating a flexible deadline that accommodates technical difficulties, time zones, and other factors that may affect students' ability to learn. For timed assessments administered in an online setting, creating a time range during which students can complete the exam in a set amount of time alleviates concerns the university's diverse student body may face. For example, an exam may be available for 12 hours through Canvas however once a student begins the exam, they have only 80 minutes to complete it.

- **Team-Based Learning**

- Team-based learning increases student accountability and can discourage cheating. Projects can be used as an alternative form of evaluation, allowing students to demonstrate and apply their knowledge. Group projects can increase student accountability, especially when students are responsible for reporting on or maintaining the integrity of the project as a whole.
- Practices to increase accountability in group projects:
  - Utilize peer evaluation, as it encourages students to take responsibility for their preparation and contributions.<sup>14</sup>
  - Consider two-person papers, which can be effective when students are randomly assigned partners and responsible for verifying the work is original. This method encourages students to check each other's work and avoid plagiarism.<sup>15</sup> While this method and the use of random pairings could potentially decrease student satisfaction, it increases accountability.

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<sup>14</sup> Clark, Michele, et al. *Off to On: Best Practices for Online Team-Based Learning*. Iowa State University, Center for Excellence in Learning and Teaching Publications, 2018, [https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1000&context=celt\\_pubs](https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1000&context=celt_pubs)

<sup>15</sup> Casey, Kevin, et al. *Academic Integrity in the Online Environment: Teaching Strategies and Software That Encourage Ethical Behavior*. Institute for Global Business Research Conference Proceedings, Oct. 2018, [www.igbr.org/wp-content/uploads/2018/10/2018-October-Conference-Proceedings.pdf#page=59](http://www.igbr.org/wp-content/uploads/2018/10/2018-October-Conference-Proceedings.pdf#page=59).

- For long term assessments, including but not limited to projects, presentations, and papers, best practices include maintaining open communication with the class in regards to the deadline to motivate and remind students, despite the irregular classroom setting.<sup>16</sup>

## World Bank Suggestions on Online Learning in the Context of COVID-19

A paper written by the EdTech team of the World Bank's Education Global Practice found that few education systems were well equipped to scale online learning for all students on such a quick timeline.<sup>17</sup> While the paper noted that providing sufficient infrastructure is often seen as the primary hurdle, it noted that the following are often greater challenges: supporting teachers so that they can support learners in a new environment; offering high quality, curriculum-relevant digital learning content and assessment tools; promoting the development of a variety of digital skills to enable students to use technology effectively; implementing supportive data and information management systems; monitoring and evaluating what's happening and its impact; and enacting enabling policies.

Highlights of other trends noted in the paper are as follows:

### A. General

- ***Moving to online learning at scale raises profound equity concerns.***
  - This transition to online learning at scale often disproportionately benefits students advantaged in the following ways: Socioeconomic status, urban over rural, high-performing rather than low-performing, and being in a highly educated family rather than a less educated family. At the same time, students with disabilities and other special education needs are often not considered when scaling online learning.
- ***Where online learning is already widespread, 'success' is more likely.***
  - If online learning or tools to support remote learning are already provided by a school or education system, the potential for success is greater

### B. Students

- ***Most online learners will experience difficulties.***
  - This is especially true for low-income students, students with limited internet access, have prior experience with online learning, and are subject to other disadvantages.
- ***Highly motivated learners, especially those with previous experience in online learning, are the most likely to take the most advantage of online learning opportunities.***

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<sup>16</sup> Sunal, Dennis W., et al. *Research-Supported Best Practices for Developing Online Learning*. The Journal of Interactive Online Learning, Volume 2 (1) 2003, [www.edtechpolicy.org/ArchivedWebsites/Articles/ResearchSupportedBestPractices.pdf](http://www.edtechpolicy.org/ArchivedWebsites/Articles/ResearchSupportedBestPractices.pdf).

<sup>17</sup> *Remote Learning and COVID-19: The use of educational technologies at scale across an education system as a result of massive school closings in response to the COVID-19 pandemic to enable distance education and online learning*. The World Bank, 2020.

- Highly motivated students with adequate resources and the ability to learn independently may be able to take advantage of learning resources offered by companies and nonprofit groups. There is value to alert students to the availability of such resources, especially in education systems that are unable to provide learning opportunities themselves.
- ***The 'best' students in off-line learning environments tend to perform better than their peers in online learning environments as well.***
  - Students that are competent and well versed in using technology tools to support learning, who have access to good bandwidth and connected devices, as well as support from family and peers are often best equipped to excel in online learning.
- ***When first going online, education systems should expect dips in student achievement.***
  - There are almost always lower educational outcomes in the short term due to lack of familiarity with tools and process, a home environment that is not conducive to online learning, equity issues, and a lack of congruence between in-person and online content. Motivation can also be a challenge.

### C. Remote Learning Content and Applications

- ***Providing a consolidated, one-stop-shop for access to online learning opportunities is strongly advised.***
  - Using single-sign access to a set of online learning opportunities, tools, platforms, and content can be helpful for students.
- ***Creating an inventory of existing learning content ready to be deployed via remote learning is necessary, as well as a plan on how to make available additional content.***
  - Beginning with an inventory of content can be a useful first step. To do so, it can be helpful to partner with educational publishers.
- ***Making content available on a wide variety of devices -- and mobile friendly -- is critical.***
  - Ensuring that online learning can be accessed using mobile devices can help ensure the widest possible user base.
- ***Supporting the use of low bandwidth (including offline) solutions is key.***
  - It is advisable to mandate online learning opportunities be optimized for low bandwidth and poor latency conditions. Promoting off-line tools and approaches and downloadable content can be useful, especially if there is time to load educational content onto devices before schools close.
- ***Videos can offer valuable learning resources when schools are closed, providing that there is sufficient available bandwidth, the content is engaging, and production values are of sufficient quality.***

- Generally speaking, shorter content is more easily accessible and absorbed by students.
- ***Providing supplemental guidance and support on how to use and access remote and online learning content can be critical.***
  - It can be helpful to clarify for students how to access content, expectations, and where to find additional information. Peer support groups for teachers via messaging platforms can streamline informal support and official information sharing. Help desks are also helpful.
- ***Using multiple media channels to share information about remote and online learning opportunities can be very useful.***
  - Multiple media channels can be used to alert learners to the existence of materials and direct them to additional support or guidance.

#### **D. What Subjects to Teach and Which Activities Lend Themselves to Remote Learning**

- ***Some academic subjects are easier to move online than others.***
  - Subjects that are lecture-based, lend themselves to self study, and already have digitized content aligned with school curricula can be adapted more easily online.
- ***Many in-school activities and approaches do not translate easily to online environments.***
  - Instructional approaches, content pacing, interaction models, and assessment may need to be adapted to online learning.

#### **E. Teachers and Teachings**

- ***Few teachers are able to easily transition to online learning environments quickly and effectively.***
  - Even teachers that utilize educational technologies can struggle to teach in an entirely online environment.
- ***Teachers working online need to be trained and supported.***
  - Teachers need sufficient connectivity in order to teach effectively online, and training on online instruction approaches and tools can be helpful. Peer support groups can be valuable for teachers adjusting to online learning.
- ***Some pedagogical approaches can be more easily translated to online learning and distance education environments than others.***
  - Courses that rely on lectures and self-study approaches are easier to adapt than learner-centered or project-based approaches.

## Part II: Blended Learning

Blended learning best practices overlap extensively with online learning best practices, as blended learning utilizes digital content. Building upon the prior focus on online learning, there are specific ways to effectively design and implement a course using the blended model. The first part of this section details academic research on these best practices.

Active Learning is cited across best practices as an effective way to keep students engaged and motivated in blended learning. WAB has researched active learning extensively in the past and defines active learning or SAIL (Structured Active In-class Learning) classes as those where students work to solve problems, interpret data or evidence, or otherwise engage in real practices in the discipline. Active learning classes typically revolve around students first engaging with the material outside of the classroom and then testing how well they have retained that information in class. Revisiting this work, we have included best practices specific to this form of blended learning.

Numerous universities have published materials promoting the use of blended learning and resources to effectively teach using this model. This section synthesizes best practices found by peer institutions.

### **Blended Learning Best Practices**

A meta-analysis and review of online learning studies by the U.S. Department of Education found that on average, students in online learning courses performed modestly better than those receiving face to face instruction. This study also found that instruction combining online and face-to-face elements had a larger advantage relative to face-to-face instruction than purely online instruction.<sup>18</sup> The following are suggestions of best practices specific to blended learning:

#### **A. Thoughtful Design**

- ***Design the course with the integration of online and in-class learning in mind.***  
Participants in a study by the University of Akron noted that technical support, technology knowledge, preparation, and clearly defined course design were crucial to a course's success. Preparation tactics include reading books or articles on best practices or blended and online learning models, attending workshops or conferences on blended or online learning models, learning from colleagues who teach blended courses, and consulting with technical experts on technology use.<sup>19</sup>
- ***Program-wide benchmarks or standards for the design of blended courses lead to less confusion for students.***

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<sup>18</sup> Means, Barbara., et al. *Evaluation of Evidence-Based Best Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. US Department of Education, 2010.

<sup>19</sup> King, Sara E. and Katie Cerrone Arnold. *Blended Learning Environments in Higher Education: A Case Study of How Professors Make it Happen*. The University of Akron. Mid-Western Educational Research, Volume 24 (12), 2011.



The Journal of Clinical Laboratory Science found that program-wide standards lead to less confusion, especially for students in more than one blended or online course. For example, standardizing communication through instructional design is helpful.

## **B. Communication with Students**

Focus groups performed by the American Journal of Pharmaceutical Education found the following best practices that relate to communication.<sup>20</sup> While these findings were designed for clinicians, the same principles apply to business courses.

- ***Return materials in a timely manner.***  
This includes posting materials with adequate time for students to complete. The consensus across focus groups found that posting online materials two weeks prior to the class or due date was reasonable.
- ***Incorporate student feedback.***  
Focus groups found that giving students a platform to share feedback with their professors helps professors to improve course delivery. In particular, students were asked to share their preparation time with professors.
- ***Incorporate short reviews of online material during class.***  
Two of the three focus groups reported liking a short summary of presented material prior to class. This review should not take up all class time, as the majority of class time should still be used to encourage active learning and application of material.

## **C. Individual Learning**

- ***Online activities should provide opportunities for self-reflection and self-discovery.***  
Opportunities for reflection and self-discovery can be provided through open-ended questions with additional resources and hyperlinks. Examples of final projects are individual research papers, self-researched bibliographies, and self-reflection in blogs or journals.<sup>21</sup>

## **D. Community**

- ***Develop a sense of community and collaborative, interactive knowledge building.***  
Collaborative assignments encourage regular connections with peers and application of learning. Educator behaviors and course design can also influence the social presence of a course, which is defined as the degree to which students feel socially and emotionally connected with others.<sup>22</sup>
- ***Synchronous chat is a way to have dynamic interactions with students.***

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<sup>20</sup> Margolis, Amanda R., et al. *Best Practices for Use of Blended Learning*. American Journal of Pharmaceutical Education, Volume 81 (3), 2017.

<sup>21</sup> McCown, Linda J. *Blended Courses: the Best of Online and Traditional Formats*. Clinical Laboratory Science, Volume 23 (4), 2010.

<sup>22</sup>Ibid.

Effective synchronous chat creates a community of inquiry and provides opportunities for interactive and collaborative learning.<sup>23</sup>

### E. **Technological Support**

- ***Accomodate students' technological access.***  
Some students may not have the same access to online materials outside of the classroom. If available, university computers can be an alternative, but this may make it more difficult for students to access all online materials and join discussions in a timely manner. When deciding the size of files to post, it is also important to understand a student's internet access.<sup>24</sup>
- ***Provide both digital and print texts because some students have difficulty reading digital texts.***  
The University of Akron noted that academic achievement has been proven to be lower when students are provided only digital text readings. Therefore, if possible, allowing print copies to be available may help students digest material.
- ***Assessments need to be adapted to fit e-learning expectations.***  
When developing assessments, traditional assessments should be evaluated alongside online assignments to decide if they fit the learning objectives and online model. If not, new assessments that promote learning may need to be created.

## Active Learning Best Practices

Active learning classes encourage students to solve problems, interpret data or evidence, or otherwise engage in real practices in the discipline. Active learning classes typically revolve around students first engaging with the material outside of the classroom and then testing how well they have retained that information in class.

There are countless ways to make a given class more or less active learning-based, and so this section will describe some of the overarching best practices WAB's research uncovered. Firstly, the most important feature of active learning is that students must come to class with at least a baseline understanding of the material. Without this foundation, the interactive approach to active learning fails, and class time cannot be used to develop students' understanding of the material by exploring interesting applications. Since putting in this additional work requires more time of students, it is important to incentivize completion of out-of-class work through some form or quiz at the beginning of each class which counts for a small part of each students' grade. These are the first, and most important, steps to making a classroom learning environment more active.

### A. **Materials**

- The out-of-class materials that students use to prepare for class help shape the format of a Structured Active Learning (SAIL) class. While some professors have suggested that simply

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<sup>23</sup> Ibid.

<sup>24</sup> Ibid.

enforcing textbook readings with a pre-quiz at the beginning of each class is sufficient, it is generally agreed that recorded videos are the best way for students to learn class concepts outside of class. For these videos to be effective, they cannot simply be recordings of class lectures, but rather must be tailored to a specific format. Ideally, each video will be targeted to a specific learning objective, and will be exactly as long or as short as is needed to explain that learning objective. If a concept doesn't require a full 80 minutes to explain, it is condensed down to as much as 20, 10, or even fewer minutes. This helps encourage students to watch the videos before class and makes them easily re-watchable if students don't understand the concepts on their first watch. Videos should aim to cover only one learning objective, in order to break the lessons into more bite-sized portions.

## **B. Class Structure**

- Once you have students who come to class prepared with a knowledge of the material, class time can be used to do almost anything the professor wants. Often, classroom time will consist of a short electronic quiz, followed by a brief (5-10 min max) recap by the professor of any material that students didn't seem to have understood based on their quiz scores. (Quizzes are also sometimes assigned outside of class to be done immediately after a student watches the videos for a class). If this recap lasts too long, it can disincentivize students from watching the videos prior to class. After this, a typical SAIL class consists of the professor working through a few problems (30 min or so) which apply the concepts learned in the videos. As students should already have some background with the concepts, these examples can often be quite advanced and help students gain a deeper knowledge of the subject. Then, for the last 30 minutes, the students will be broken up into groups which work on similar application problems to help them gain practice with the material. These groups may stay the same from class to class or change based on the tasks to be completed.

## **C. Grades**

- The grading structure is an important part of how a SAIL class functions. WAB's academic research and discussions with Penn professors have shown that criterion-based grading is the most effective grading structure for active learning. In this approach, students are given various learning objectives related to mastery of important course materials, and a student's grade is based on how many of these learning objectives they are able to meet, independent of their performance relative to their peers. This is because a valuable component of active learning is collaborating with and learning from your classmates, and this does not work when students are competing with each other for grades. One caveat to this independent grading model revolves around groups. It is often beneficial in SAIL classes to have group learning objectives, incentivizing a group to work together and help each other understand the material.

## **University Guides to Blended Learning**

### **A. Boston University**

- The Boston University Center for Learning & Teaching defines blended learning as "the strategic combination of face-to-face and online learning experiences." Notable benefits are that blending learning models can result in improved student success, satisfaction, and retention. BU's Center for Teaching and Learning shares that blended learning courses succeed when they are

strategically aligned with a department's, school's, or college's mission and goals. These courses utilize data analytics. Online tools available in blended courses can also enhance student engagement. Methods to enhance the classroom experience include practice problem sets, case studies, and discussion-based classes. Additionally, interactive technology could be used to further support learning, such as student response systems, video lectures, and more. Flipped learning is another alternative to traditional learning, where lecture content is transitioned to digital media to allow students to engage in the material before class, while spending class time working on problem sets or using another type of active learning.

- [Boston University](#) offers further in-depth guides on the following approaches:
  - Active learning
  - Case-based learning
  - Discussion-based teaching & learning
  - Experiential learning
  - Flipped classroom
  - Project-based learning

#### **B. Vanderbilt University**

- [Vanderbilt University's Center for Teaching](#) defines blended (or hybrid) instruction similarly to Boston University, articulating that it includes instruction with between 30 and 80% of course content delivered online. Vanderbilt cites benefits that include students performing better, and suggested that the combination of elements like learner-centered education, collaborative & interactive learning, metacognitive awareness, increased flexibility, immediate feedback, and multimodal content. Vanderbilt suggests that teachers design their courses with the theme of knowing the students and ease their transition. To do this, it is important to develop clear learning goals and have clear expectations for the class. Furthermore, it is important to support student's independent learning by providing clear organization of material through objectives, material, and associated activities. Finally, Vanderbilt encourages classes that promote collaboration, active learning, and incorporate multiple types of media.

#### **C. Stanford University**

- [Stanford University's Teaching Commons](#) finds moving basic content to out-of-class, online activities provides greater opportunity for active learning within the classroom and collaboration during class time. It has additional benefits of helping fostering student-instructor and student-student interactions, a better sense of community, and greater flexibility for the students in the learning process. When designing a class with blended learning, Stanford suggests using a "Backward Design" approach where instructors first identify the desired outcomes of their class, then develop the design and assessment to fit the outcomes. Stanford further cites evidence that breaking down information into 4 levels, starting with large "big ideas", then breaking information into "essential questions", "key knowledge", and finally "learning activities" that students actually do to interact with the content.

#### **D. Columbia University**

- [Columbia University's Center for Teaching and Learning](#) uses similar principles to the above schools, as they've experimented with flipped and hybrid learning environments. Columbia notes that students have a deeper learning experience, opportunities for greater engagement, both



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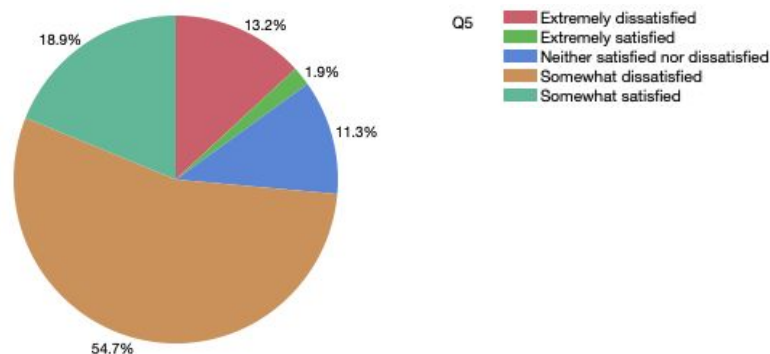
inside and outside of class time, a flexible environment, and greater autonomy for students in the learning environment. Columbia finds effective blended learning courses are learner-centered, with intentional integration of educational technologies, guided instruction, and ongoing feedback.

### Part III: Survey Data and Analysis

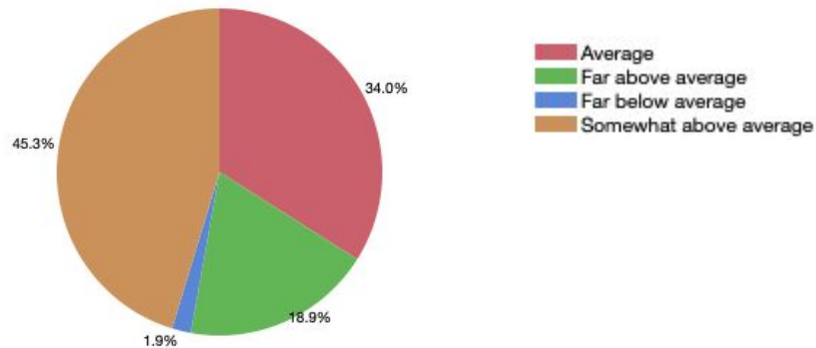
The analysis for an N=53 survey targeted towards all Penn undergraduates about their transition to online learning is detailed below. The nature of online learning made it more difficult for students to connect with one another and created unique problems such as different time zones and a lack of wifi bandwidth for some. The survey also sheds light on what has worked well, and what students want to see online in the future. These findings include flexible office hour times, optional attendance if people are working in different locations, and open book exams to try and eliminate cheating.

#### **A. Quantitative Results**

- **32% encountered technical difficulties when transitioning to online learning.**
  - Lack of wifi bandwidth, shared technology with those around them, and quality of technology played into this.
  - It was hard to keep track of professor expectations and materials.
- **39% of respondents were in a different time zone than Philadelphia.**
  - Of this subsection 73% found it somewhat difficult to learn in a different time zone.
  - Those on the west coast had to wake up at 6 am for some mandatory classes.
  - Assignment deadlines weren't clear as a result of different time zones. Canvas would sometimes show a person's time zone and other times show EST.
  - Some students missed out on live sessions, making class feel like a "glorified YouTube."
- **68% of respondents were either somewhat dissatisfied or extremely dissatisfied with their ability to connect with other students.**
  - Students found breakout rooms and teams coordinated by time zone to be the most useful when it comes to interacting with peers.
  - How satisfied were you with your ability to connect with other students?



- **64% of students believed that there had been more cheating this past semester when compared to other semesters.**
  - Students responded that they knew of students collaborating in finals, using notes and resources on exams, and lying about circumstances to extend deadlines.
  - To your knowledge, how has the cheating this semester compared to other semesters?



## B. Qualitative Results

- ***Support systems that Professors used that students found helpful:***
  - Frequent office hours
  - Lenient deadlines
  - Bringing in guest speakers virtually
  - Open note exams
- ***Technology students want to see integrated to the classroom in the future:***
  - Recorded lecture and recitations for future reference
  - More interactive methods of live communication (e.g. live polling and Q&A time)
  - Polls to receive feedback on class structure
- ***Student Satisfaction***
  - Live recitations were more favorably received than pre-recorded recitations, but both live and pre-recorded lectures had high levels of satisfaction
  - Office hours had high levels of satisfaction
  - Live discussions outperformed discussion forums

The table on the following page includes a summary of the responses to the question, “how satisfied were you with the following elements of virtual learning?”

	Extremely Satisfied 4	Somewhat Satisfied 3	Neither satisfied nor 2	Somewhat Dissatisfied 1	Extremely Dissatisfied 0	Average
Pre-recorded lectures	16	26	3	7	1	2.94
Professor Office Hours	8	18	7	7	0	2.70
TA Office Hours	6	16	9	5	0	2.67
Individual projects or presentations	4	24	11	3	1	2.65
Live lectures	2	29	7	6	2	2.52
Live discussions	5	19	7	9	2	2.40
Live recitations	4	10	7	5	2	2.36
Pre-recorded recitations	6	8	3	5	8	2.00
Discussion forums	4	11	12	16	3	1.96
Groups projects or presentations	2	16	10	12	6	1.93
Interactions with classmates	0	10	11	19	12	1.38



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