



Inclusive Learning Series

Research Insights from the Ally Community



Choose your Format: Usage of Alternative Formats of Course Content

Extended Abstract

“Alternative formats” of learning content have historically been reserved for people with disabilities, however, emerging learning theories emphasize providing all students with content in multiple formats that meet their unique learning needs, preferences, and devices. Despite the promising benefits to student learning, there has been little empirical research that examines student adoption and decision-making when presented multiple options of their learning materials. In this paper, we analyze data gathered over two years from over 7 million alternative format downloads across 300 US colleges and universities using Blackboard Ally. The Ally software automatically generates eight different alternative formats of digital content uploaded by instructors into their Learning Management System (LMS) courses and makes these available to all students on demand.

Key Findings

- Comparing download activity at the beginning and end of a term, an increase in the number of downloads per student and an increase in the conversion rate between opening the alternative formats window and downloading a specific format suggests students find sustained value from the formats as the term progresses.
- Although PDF was the most prevalent file in LMS courses (most often downloaded as a mobile-friendly HTML format), Word docs and presentations respectively were the file types most frequently downloaded as an alternative format (most often as a Tagged PDF). Other file types such as ePub, MP3, and OCRed PDFs account for less than 10% of total format types downloaded.
- Institution type (based on Carnegie Classification) and institution size (based on Full Time Enrollment) do not appear to have a significant effect on the median download rate of the alternative formats. The types of formats downloaded also appear consistent across different institution types, with Tagged PDF and HTML representing between 89% and 92% of the total formats downloaded across all four institution types.

Implications

While most of the institutions represented in the data set only recently adopted Ally and have yet to promote the alternative formats widely to students, the usage rates suggest rapid, organic uptake by students. Download rates suggest many more students than those with disclosed disabilities access the formats, and that their value appeals to students regardless of the type of institution they attend. At the same time, the concentration of Tagged PDF and HTML downloads suggests students may not be completely familiar with why or when to use other available formats like ePub, and may benefit from more guidance on how to use a variety of formats to support their learning needs.



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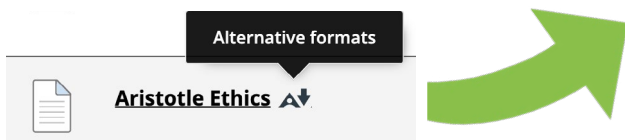
Choose your Format: Usage of Alternative Formats of Course Content

Study Context

Over the past several decades, learning theories have increasingly privileged more personalized learning experiences. Universal Design for Learning (UDL) frameworks emphasize representing learning content in a variety of sensory modalities and formats to provide students with choices that fit their unique learning needs and preferences. Reasons for making “Alternative Formats” of learning content available to all students include:

- Research suggests [66% of students](#) who may qualify for disability-related accommodations do not disclose that they have a disability
- [Increased use of mobile devices](#) and tablets require responsive formats for optimized reading experiences
- [“Bimodal presentation”](#) - listening and reading to content at the same time - can benefit student with learning disabilities and second language learners
- Commuter students, working students, and students with family obligations may benefit from more flexible options for studying and reviewing course materials on the go

In this paper, we analyze trends in student usage of **Alternative Formats** of course content in the Learning Management System (LMS) generated through Blackboard Ally. Wherever students see the ‘A download’ icon next to their course files (pictured below) they can click the icon and view the available formats, which will depend on the type of original file.



Clicking the Alternative Formats download icon next to a course file opens the menu of options

Data Set and Research Questions

The data set includes Alternative Format (AF) activity from 313 US colleges and universities of varying size and type with alternative formats enabled in at least 70% of their Fall 2019 courses. Over 600 institutions had at least one download in Fall 2019, but may have been in a pilot phase of their implementation, and were therefore only counted in some of the aggregated totals. AF activities include clicking the AF icon to open the AF menu and downloading a particular format. While any user in a course can download an Alternative Format, students were responsible for over 99% of total downloads.



What are overall trends in download activity and types of formats downloaded by students?



How does download activity compare across different types of institutions, as determined by Carnegie Classification and Total Full Time Enrollment (FTE)?

List of Alternative Formats and their use cases

Format Type	Original File	Use cases
Tagged PDF	Word, PPT	Devices without MS Office; Screen reader; Reduced file size
HTML	PDF, Word, PPT	Mobile-friendly; Responsive; Semantic markup for structure
OCRed PDF	Scanned PDF	Searchable document; Screen reader friendly
ePub	Word, PPT, PDF, HTML file	Annotation and highlighting; Font customization; Mobile
MP3	Word, PPT, PDF, HTML file	On-the-go learning; bimodal presentation
Electronic Braille	Word, PPT, PDF HTML file	Tactile reading; Improve spelling/grammar
Language Translation	Word, PPT, PDF HTML file	2nd Language Learners; Supporting families
BeeLine Reader	Word, PPT, PDF HTML file	Speed reading; Eye and attention focus

Join the Ally User Group: usergroup.ally.ac



↓ Total AF Downloads over Time and by Type

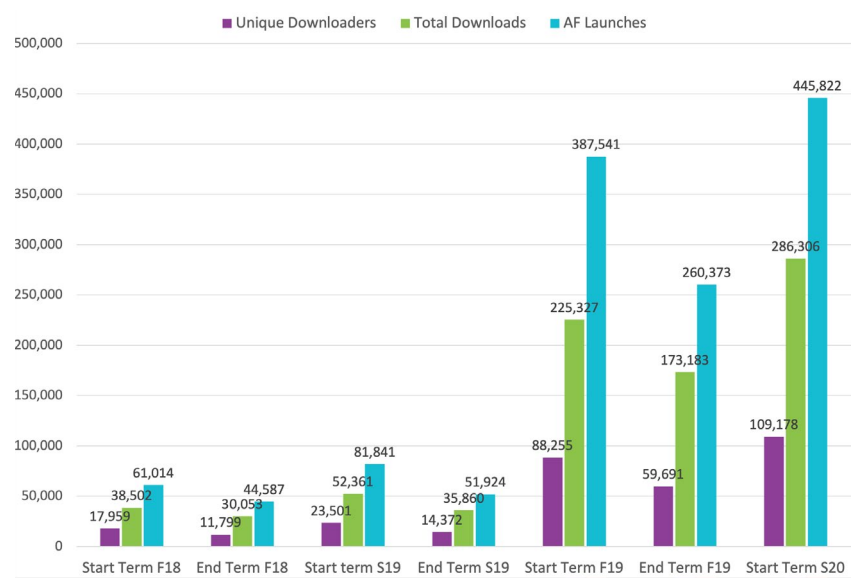
In just under 2 years, **7.39 million** Alternative Formats were downloaded in the US, about half of which occurred during the Fall 19 term. The bar graphs illustrate the average number of downloads during the first three weeks and last three weeks of the semester. The **528% increase** in downloads from the start of the Spring 18 term and start of the Fall 19 term can be attributed to both an increase in the number of campuses using Ally and a design change that introduced a more prominent AF download icon.

Focusing on the Fall 19 term, while the number of unique downloaders decreased by 32% from start to end, the number of downloads per user **increased from 2.55 to 2.90**. Further, the conversion rate between launching the AF modal and downloading a specific format also **increased from 55% to 67%**. While the decrease in number of unique users over a term may be due in part to student drop-out and lower LMS usage, the increase in downloads per user and conversion rate suggest **many students find sustained value from the formats** and continue accessing and downloading them during the term.

Of the four file types represented in the figure to the right, PDF was the most prevalent in LMS courses during the Fall 2019 term, though Word Docs and Presentations were most frequently downloaded as an Alternative Format (*Note: BeeLine Reader and Language Translation were available on a limited basis*). For 203 institutions with a designated "Fall 2019 term" in their LMS:

- **920K Tagged PDFs** were downloaded from **5.2M Docs and Presentations**
- **60K OCRed PDFs** were downloaded from **765K Scanned PDFs**
- **420K HTML files** were downloaded from **9.75M PDFs, Docs, and Presentations**

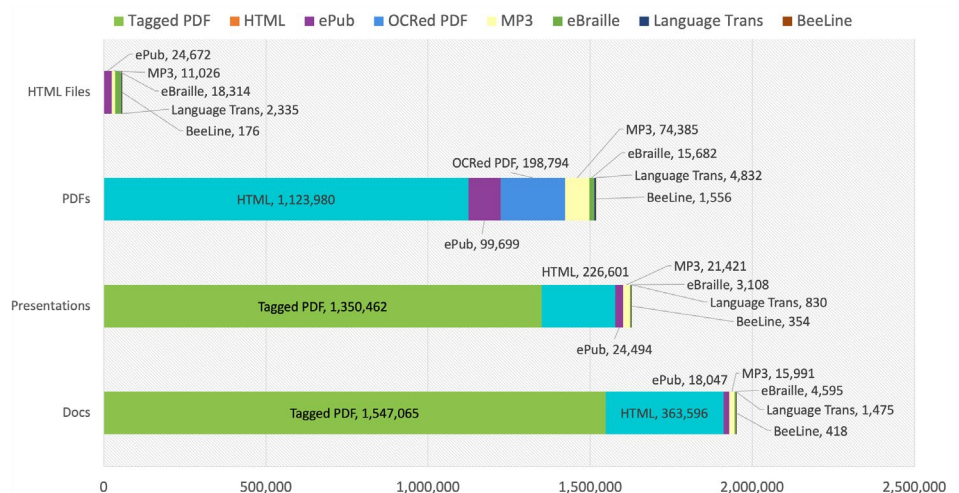
Total AF Activity during Start and End of Terms: All US Ally Users



Supporting Diverse Student Needs

- A culinary arts major with low vision reports using the **HTML format** because PDFs are not conducive for zooming in on a text. She also saves the HTML format in her browser to access her texts on different devices.
- A graduate student with learning disabilities reports using the **OCRed PDF** paired with the **MP3** because "bimodal presentation" benefits his comprehension.
- A commuter student with children at home reports downloading her content in **MP3** form so that she can review her materials during a long drive to campus.
- A student with diagnosed anxiety reports using the **HTML** format for a simpler, high-contrast text that is easier to read.

Total Downloads by File Type, F19 Term





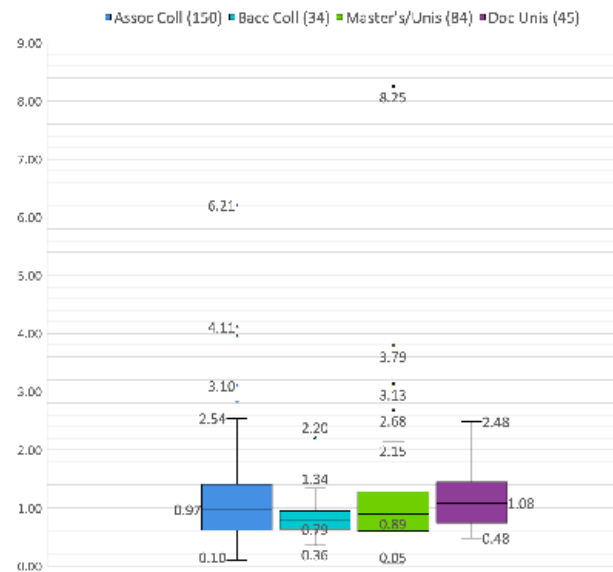
AF Downloads by Institution Type

The box plots to the right represent the number of downloads per FTE for the subset of 313 US institutions based on Carnegie Classification and Institution Size. The legend for each chart includes the number of institutions that fall in each category. For the Carnegie categories, Associate's Colleges are the most over-represented in the data set while Baccalaureate Colleges are the most under-represented. For the Institution Size categories, Small (2,501-7,486 FTE) and Smallest (299-2,495 FTE) are the most over-represented and Largest (25,978-58,180 FTE) and Large (15,243-25,106 FTE) are the most under-represented.

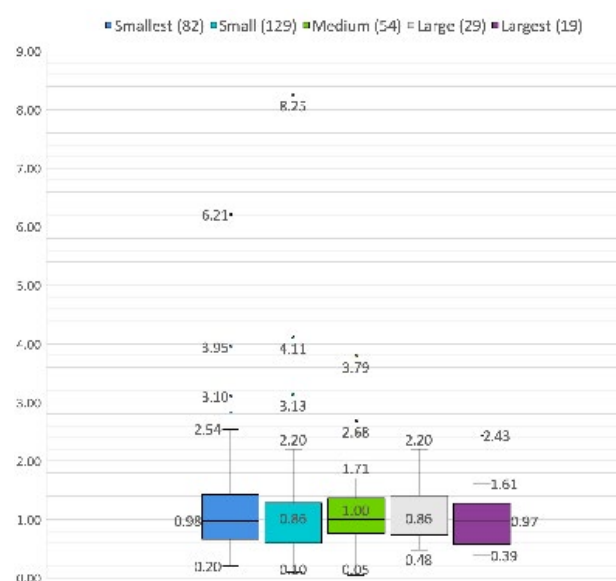
Comparing median downloads for Carnegie categories, Doctoral Unis have the highest download rate, **exceeding 1 download per FTE**, with Associate's Colleges slightly below at .97 downloads. Baccalaureate Colleges have the lowest download rate at .79 downloads, .29 downloads less than Doctoral Unis. Comparing the Institution Size categories, the disparity between the highest category (Medium) and lowest categories (Small and Large) is .14 downloads per FTE. While the uneven distribution across categories may contribute to the disparity in download rates, without additional data it is difficult to infer why Baccalaureate Colleges are the only grouping with a download rate below .85. The similar download rates across opposite categories (large-small; Associate's-Doctoral), however, may be an indicator that institution size and type do not influence the adoption or the perceived utility of the alternative formats by students.

The similarities in AF usage also appear in the types of formats downloaded, where the **Tagged PDF and HTML formats account for between 89% and 93% of total AF downloads for all four Carnegie categories.** The difference in OCR'd PDF downloads can be attributed to differences in the number of scanned PDFs in their F19 courses. Master's Colleges and Doctoral Unis had the highest percentage of scanned PDFs to total PDFs (17% and 18% respectively) and the largest percentage of OCR'd PDF downloads, representing 5% of their total AF downloads compared to 2% for Associate's and 4% for Baccalaureate Colleges.

AF Downloads per FTE by Carnegie Class



AF Downloads per FTE by Institution Size



Enhancing Learning Experiences and Study Practices with Alternative Formats

Of the 313 institutions, **139 exceeded one AF download per FTE and 19 exceeded two per FTE.** Considering Ally is relatively new on most campuses and some courses may have a limited amount of digital content, the download rates suggest that students are discovering the formats on their own and increasingly making them part of their learning. There is also an opportunity to further educate students on how to use the formats and how to leverage different modalities and reading practices in their study habits, such as using the ePub to engage deep reading comprehension practices. Instructors can take advantage of the formats as well, such as replacing their original scans with the OCR'd PDFs to save students time downloading, or reviewing their lecture materials with the MP3 format to assess the clarity of their content.