K-12 BLUEPRINT

Curriculum Platform Evaluation	**Commissioned by Intel®**
August 2020	**Prepared by Clarity Innovations, Inc.**

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Planning for Virtual Learning

How Connectivity, Operating System, and Device Selection
Effects Teaching and Learning Outcomes for Virtual and Blended Environments

Executive Summary

This evaluation report provides information to help school districts make informed choices in selecting the right devices to equitably support students and educators returning to school – virtually or in blended/hybrid learning environments – in the fall of 2020. Using authentic examples of curricular, pedagogical, and instructional practices, including applications, tools, and services students and educators regularly use, this study provides specific test results and recommendations for school and district leaders to help them make informed decisions to meet the needs of each student. The report highlights equity considerations including how rural, BIPOC, and students residing in high poverty areas are disproportionately affected by persistent periods of limited or no connectivity to the internet.

By exploring devices running the most common operating systems and typical software used in K-12 education, challenges including device storage and the functionality of applications when no internet connection is present must be addressed for virtual and online learning to be successful. While there is no one-size-fits-all solution, the key findings of this report will help school districts make the right choice to improve the process and practice of teaching and learning.

> "Students who do not have home internet access...spend more time on their homework, have lower grade point averages, and have weaker digital skills, even after controlling for socioeconomic factors that potentially influence academic performance[1]."
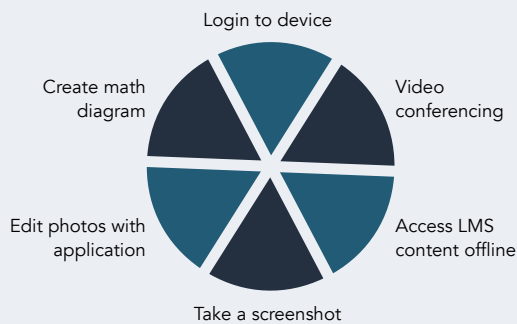
Digital Learning Tasks

Chart 1: Example learning tasks tested in this study.
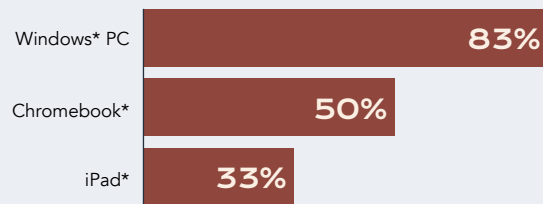
Offline Task Completion Rate

Chart 2: Success rate of each operating system completing digital learning tasks when not connected to the internet. See Appendix C in the full report for details.

Read the Full Report

Download the full report online at the **K-12 Blueprint** website.

[1] Source: Columbia Telecommunications Corporation, Mobile Broadband Service Is Not an Adequate Substitute for Wireline (Kensington, MD: Author, 2017).

8 Key Findings

1

Many common education apps and browser extensions have limited or no functionality – depending on operating system – when not connected to the internet.

2

All platforms require connectivity on first use of the device to provision applications and resources and federate login credentials.

3

Device storage is key to support devices that do not have a persistent, high-bandwidth connection to the internet. Expandable storage options including SD Cards and USB drives should be considered as a means to deliver curricular materials to students and will effect total cost of ownership.

4

Offline access to most learning management systems (LMS) is extremely limited or unavailable. Some LMS services, like Canvas*, allow users to download an entire module as an HTML or EPUB file which can be used as a work-around solution for students who lack connectivity.

5

Most of the evaluated curriculum from various publishers do not have digital applications or mobile access that support offline use, though many offer collections of materials (e.g., PDFs and video files) that can be downloaded and shared.

6

Adobe Flash* is still present in many K-12 resources and presents problems across many platforms (e.g., Apple* iPad* doesn't run Adobe Flash* applications). Flash* is scheduled to be deprecated by **Adobe*** in December 2020 and will no longer be available on **Chromebooks*** after January 2021.

7

Enabling and accessing files stored on Google Drive* for offline use is a complicated, **multi-step process** which includes using only the Chrome* browser, installing the offline extension, enabling offline access through the Chrome Management Console*, and making specific files available offline.

8

To support students with limited or no internet connectivity, educators and curriculum specialists must be mindful of file sizes and delivery methods for content shared with students and plan for how students can submit their work.

Storage Available for Curriculum and Student Work

	Total Storage	OS & System Requirements	Available Storage
Windows* 10-based device	128 GB	43.4 GB	84.6 GB
Chrome OS*based device	32 GB	14.8 GB	17.2 GB
iPad*	32 GB	7.3 GB	24.7 GB

Maximum Capacity for Curriculum

	Available Storage	Maximum Number of Lessons[9]	Maximum Number of Classes Supported[10]
Windows* 10-based device	84.6 GB	399	5.5
Chrome OS*-base device	17.2 GB	81	1.1
iPad*	24.7 GB	117	1.6

Choosing the Right Device for Virtual Learning

The Right Windows* Device for K-12 Education

The Right Chromebook* for Virtual Learning

2

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