

Total Cost of Ownership Case Study: Township High School District 211 iPad vs Chromebook

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Information



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Documentation of the Township High School District 211 story was commissioned by Apple Inc.



Background and Methodology

In 2010, Township High School District 211, located in Northern Illinois, began investigating the learning impact and opportunities for students who were able to have an individualized learning device. These investigations developed into a 1-1-iPad pilot program for a group of approximately 1,500 students in the 2012-2013 school year. The 1-1 pilot grew to encompass 7,500 students in the 2013-2014 school year, and the following school year 1-1 iPad devices were rolled out to all 11,800+ District 211 students. Several factors influenced the selection of iPads for all students (implemented in the 2014-2015 school year) including: general feedback from students, teachers, parents, and community members, surveys implemented across the district, cost considerations, and technical performance.

In 2016 Township High School District 211 conducted a thorough review of the 1-1 educational device landscape to ensure the iPad provided the best learning opportunities for the district's students. A 25-member cross-disciplinary team built a multiple approach methodology to update the findings of their initial pilot study and establish long-term program goals. District 211 visited 13 schools, six of which provided students iPads and seven that provided students with Chromebooks to gather feedback on performance of each device. As part of this evaluation, District 211 conducted a total cost of ownership (TCO) analysis to compare costs and potential benefits of the 2016 generation iPad and Chromebook devices.

This TCO analysis project involved teachers, department heads, principles, and district administration and IT professionals. The District 211 teams conducted research on: **Device Research:** 1-1 device options and variants (including students testing various device options in classroom settings). **Technical Analysis:** Infrastructure impact including - device setup, management, classroom connectivity, and extensibility. **Innovative Teaching:** Learning impact and transformation through digital best practices. **Site Visit:** Interviews and site visits with multiple school district around Northern Illinois. **Input Gathering:** Surveys and interviews with students, teachers, parents, business and community groups, and articulation with feeder schools and colleges. **Professional Development:** Building capacity and transformation opportunities through instructional practices. This research and data created a comprehensive Total Cost of Ownership analysis that also included extensive comparative data analysis on device, support, and repair costs, and including residual value.

Through the 2016 TCO analysis, subcommittees identified a set of 47 essential features across 13 categories that any one-to-one device should have in order to support the District's goal of transforming students' teaching and learning experiences. Each of these features was then applied to the iPad and Chromebook using a 4-point rating scale to assess each device's ability to achieve the District's objective. The rating scale was defined as 1 – very weak, 2 – weak, 3 – strong, and 4 – very strong. Subcommittees independently rated the features. Results were combined to create average ratings for each specific feature. The iPad was rated higher on 40 unique essential features. Three features showed equal ratings for both devices. The Chromebook was rated higher on four features.

In January 2017, Township High School District 211's One-to-One Committee made a formal recommendation to their Board of Education to re-authorize iPad as the 1-1 student-device for all 11,800+ students within the district.

In 2018, Apple, Inc. contacted Simba Information, an independent market research firm, and contracted with Simba to work directly with the Township High School District 211 team to document their story, process, and TCO analysis. The goal of the project was to allow District 211 the opportunity to share its TCO analysis with others in the education market.



Township High School District 211 shared all research, interview notes, and data analysis that it used in 2016 to build its TCO analysis of iPad and Chromebook with Simba Information. Simba Information used the information provided by District 211 and interviewed members of the original District 211 project team to develop the below case study of Township High School District 211's four-year TCO comparison for iPad and Chromebook. The full examination included the cost of acquiring the devices and the costs incurred over the product's lifecycle, including warranty, support, and professional learning and development, as well as educational benefits and retained device value.

District 211 also noted that since there were multiple Chromebook brands and models available at the time of their analysis in 2016, they considered many potential Chromebook options. After researching multiple models, District 211 did not pick a specific model for comparison. Instead, they assumed basic characteristics for an average Chromebook device and used an average price of \$199 in its total cost of ownership (TCO) analysis. District 211 also considered potential educational discount pricing structures on relatively basic Chromebook features. In the appendix, you will find a description of a few contemporaneous models that were considered at the time and their retail price.

Simba Information did not conduct any outside research for this case study. All opinions, data and conclusions, including noted costs and benefits of iPad vs Chromebook models, in this case study represent the findings from the interviews, data provided, and research conducted by Township High School District 211 in Northern Illinois in 2016.



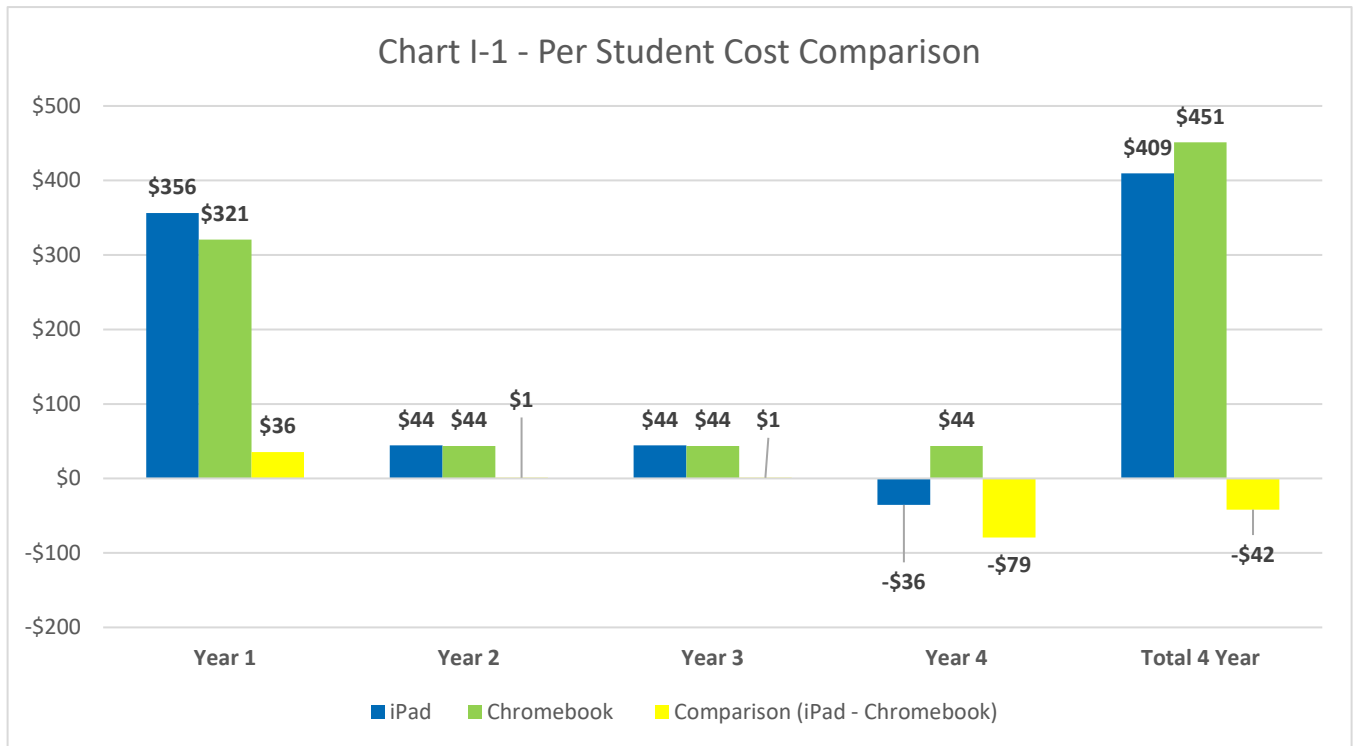
Executive Summary

District 211 saves \$126,000 per incoming class over four years by choosing iPads over Chromebook devices.

- District 211 saves **\$42** per student over four years by using iPads instead of standard Chromebook devices.
- According to District 211, if they had chosen to pursue advanced Chromebook options, they would have needed to spend **\$200** per student for the Touch Chromebook models compared to an iPad, and still would not have the full functionality of an iPad.
- District 211's research determined that iPads are four times less likely to break than comparable Chromebooks, which results in lower repair costs over four years. District 211 typically experiences an iPad damage rate of 5% annually. When District 211 interviewed Chromebook-based Districts, they reported annual damage rates to Chromebooks in excess of 20%.
- Based on District 211's interactions with school districts utilizing the Chromebook as a one-to-one student device, Chromebooks require more frequent repairs, so a larger fleet of excess devices must be available during downtime (5% surplus iPads vs. 20% surplus Chromebooks).
- Their research showed that the G-suite product offerings (which involve a one-time payment of **\$30** at the time of device purchase) alone would not be sufficient for classroom management and needed to be supplemented with third-party services such as Hapara (**\$6** per student per year).
- They also concluded that iPads could be resold for approximately **\$80** after four years of use, while Chromebooks would have no resale value after four years.

District 211 determined that iPads provide many educational benefits that cannot be duplicated by Chromebooks in the classroom.

- District 211 noted that key free apps – like iMovie, Pages, Numbers, and Keynote – allow students to create, present, and demonstrate understanding of their learning more effectively than if they had no one-to-one device.
- Compared to Chromebooks, District 211 determined that iPads provide better features for classroom efficiency and organization. Teachers can save time managing classroom activities through apps like Classroom and features like AirPlay.
- According to their research, the tablet design, and the wireless connectivity of an iPad to other resources, allows teachers to move freely throughout the classroom and better engage with students. Teachers using iPad devices discovered that they were able to provide instruction and support from any location in the classroom and easily modify their room layout to best accommodate student learning styles because they were truly mobile.
- Based on the District 211 pilot, they concluded that iPads provide mobility and flexibility which assists teachers with modifying instructional practices for the SAMR (substitution, augmentation, modification, redefinition) model. Based on observations of Chromebook-based classrooms and iPad-based classrooms, teachers can easily modify instructional practices with an iPad, while Chromebook classrooms are more likely to remain in the 'substitution' phase.
- Transforming the learning experience for students is one of the most prominent benefits of the iPad environment, according to District 211 faculty. Teachers within the District 211 district feel students have more opportunities to creatively learn and express their ideas when using iPad devices.



Cost Per Student (over 4 years)	iPad	Chromebook	Chromebook Touch
Device Purchases*	\$309	\$275	\$370
Device Set-Up	\$3	\$2	
Warranty Plan	Self-Insure		
Repairs	\$49	\$74	\$137
Accessories/Software**	\$100	\$76	
Device Management	\$28	\$24	
Residual Value	\$80	\$0	
Total Cost	\$409	\$451	\$609
Cost Compared to iPad (over 4 years)		+\$42	+\$200

*Includes the cost of additional surplus devices that must be purchased. Differences from unit costs reflect higher surplus costs. Chromebook device costs also include the additional \$30 per device at purchase for G-suite management.

**Includes device software (necessary apps for classroom performance) and cases as the sole accessory for both devices



Overall Findings

Township High School District 211, located in Northern Illinois, includes five comprehensive high schools and two academies, totaling over 11,800 students. District 211 directly compared the performance of Chromebooks to iPads in select test classrooms in order to evaluate relative performance. Based on the two-year pilot program results, District 211 chose to introduce a 1-1 student-device ratio of iPads to its entire student body in the 2014-2015 school year. District 211 conducted a total cost of ownership (TCO) analysis in 2016 and determined that iPads save **\$42** per student over four years compared to Chromebooks and allowed for greater flexibility in the classroom for creative teaching methods and learning opportunities.

Students are provided with devices at the start of their freshmen year and retain the device for all four years. Upon graduation, students may purchase the device at resale value from District 211. The most recent TCO analysis performed in 2016 considered the iPad Air 2 model specifications and accounted for newly revised pricing models for current iPads (i.e. 6th generation iPad model). The District chose a folio-style case as the only accessory for the iPads.

Simba Information interviewed several District 211 faculty members about the comparative performance of iPads versus Chromebooks among their students. District 211 also shared its own internal estimates for the relative costs between the devices across several categories. All data and conclusions in this case study represent the findings from the interviews, data provided, and research conducted by District 211. Data provided by District 211 reflected both their initial pilot study findings (2011-2013) as well as updated cost estimates and full TCO analysis performed in 2016). See [introduction](#) for full explanation of the pilot study.

Section I: TCO Findings

Internal data and conversations with District 211 administrators revealed that Chromebook models have higher per-student costs than iPad devices. Choosing an iPad saves District 211 **\$42** per student over four years compared to a standard Chromebook, and nearly **\$200** per student compared to a touchscreen Chromebook model.

The cost advantages of an iPad environment were most prominent in the following key areas:

Damage and Repairs: During the initial pilot studies performed between 2011-2013, District 211 found that Chromebooks suffer frequent damage, **nearly four times more often** than iPads, resulting in higher repair costs and a large suite of surplus devices required to cover downtime. District 211 would need to purchase a surplus fleet of **20%** for Chromebooks, compared to the **5%** currently purchased each year for iPads. Expected repair costs are significantly greater for touchscreen Chromebook models – more than two times higher than iPads due to expensive screen repairs.

Device Management: District 211 concluded that Chromebooks require more device management over the product lifecycle than is available with basic G-Suite functions. G-Suite is included with Chromebook devices for a **\$30** one-time surcharge when the device is purchased. District 211 found that test classrooms required additional management services through Hapara, estimated at **\$6** per student per year. District 211 currently is able to effectively manage iPad devices through free services from Apple (such as Apple School Manager) and supplemental services through JAMF (at **\$7** per student-year).

Residual Value: Upon graduation, District 211 students can choose to purchase their device from the district at resale value and if not, District 211 sells the devices to third-party resellers. Based on JAMF valuation of the relative retained value of iPads vs Chromebooks, iPads have an estimated resale value of approximately **\$80**



after four years. [JAMF also reports](#) (link active as of 3/11/2019) that **Chromebooks have no retained value** and would provide no cost savings after four years. These estimates are consistent with resale values recouped by District 211.

Section II: Classroom Performance

Available Apps and Native (Free Software)

The iPad offers several free apps, including Pages, Numbers, Keynote, iMovie, and Clips, which have proven to be very useful in District 211's educational setting and were a key factor in the selection of iPad devices for its 1-1 program. These apps are often used by students and help with documentation and creative expressions of learning. Other apps which contribute to student and faculty learning environments include Notability (which supports sketching and note taking), Schoology (Learning Management System) and Apple's Classroom app. Apple Classroom supports classroom management (including distributing and collection assignments) as well as collaboration and student performance.

Classroom Productivity and Management

Compared to Chromebooks, District 211 determined that iPad provides better features for classroom efficiency and organization. During the pilot study, teachers were able to reduce time spent on simple tasks, such as organizing paper notebooks or handing out assignments.

Teachers using iPad devices discovered that they were able to move freely throughout the classroom and easily modify their room layout to best accommodate student learning styles because they were truly mobile. In comparison during the 2016 TCO review process, District 211 found that Chromebook classrooms were not able to mimic this mobility, as teachers were often 'wired' to devices for display or charging purposes. This reduced the level of engagement a teacher had with students.

Creativity and Learning Measures

District 211 feels one of the most prominent benefits of the iPad environment in the district has been the ability to transform the learning experience. Teachers, within District 211, feel students have more opportunities to creatively learn and express their ideas when using iPad devices. Apps such as iMovie and Clips, combined with the mobility of the device and front/rear cameras, allow students to record and edit videos that are easily shared with classmates, teachers and parents. And, students can compile their work in imaginative documents with Apple's Pages and Numbers, or present graphically rich content with Apple's Keynote app.

According to those interviewed in the District 211 district, creativity was a key benefit of iPads in the classroom. Key learning objectives of the SAMR model were easily met due to the free movement of students who could record and share their work with others. District 211 noted that Chromebook classrooms were using Chromebooks only to substitute for physical materials, and when creativity was required, students used personal devices (phones) complete the assignment, while iPad classrooms were able to transform the learning process.

Additional Benefits

District 211 continues to measure the outcomes of iPad use in the classroom, such as how often devices are being used by students during the school day and afterwards. Additionally, the district observes how teachers are using the devices to modify instructional practices for the SAMR (substitution, augmentation, modification, redefinition) model of technological integration in education. iPads have continuously performed well on these measures, and the district has used this performance to justify their continued use instead of Chromebook alternatives.



Conclusion

Based on their research, iPads have significantly lowered total costs of ownership, saving Township High School District 211 **\$42** per student over four years compared to standard Chromebooks and nearly **\$200** per student over four years compared to touchscreen Chromebook models. Not only do iPads have a lower total cost of ownership, according to District 211 they also offer more classroom benefits than Chromebook alternatives. With iPad, Teachers are able to move freely through classrooms to better engage with their students. Apps like iMovie, Clips and Pages encourage student creativity, while Classroom supports efficient teacher management and classroom learning/activities beyond substitution into the full SAMR model.



Appendix: District 211 2016 Considered Chromebook Models and Specifications

Brand*	Model	Screen Size	Touch Enabled	Storage	Retail Price
Acer	R11/C738	11.6"	Yes	32 GB	\$279
Dell	Chromebook 11	11.6"	Yes (add-on)	16 GB	\$239
HP	11 G4	11.6"	No	16 GB	\$279
Samsung	Chromebook 3	11.6"	No	16 GB	\$230
ASUS	C202	11.6"	No	16 GB	\$229

*These models represent a sample of some Chromebook options evaluated in 2016 by District 211. No specific model was fully evaluated in District 211’s 2016 TCO analysis. Rather, a base bulk price of \$199 per device was selected for comparison, and general Chromebook performance specifications were assumed.