Chapter 2: Adoption and Diffusion of the Apple iPad

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Key Points:

- A brief history of the Apple iPad
- Examines the adoption of the Apple iPad with emphasis on K-12 education
- Investigate the benefits and barriers of the Apple iPad in the educational setting
- A discussion of the impact of the iPad on K-12 education
- Explores how the iPad paved the way for the adoption of Google's Chromebook

Abstract

The Apple iPad was conceived before the iPhone but was announced and released after the iPhone. Since its 2010 release, over thirty different iPad models have been designed and developed. This chapter seeks to give a brief historical overview of the iPad. It will discuss the need, development, features, marketing, and how early adopters communicated about the device. Then, using Roger's Initial Assessment of the Diffusion of Innovations, this analysis will explore the different stages of iPad adoption, emphasizing adoption in K-12 education. The chapter will discuss the usage of iPads in the K-12 educational setting and the recent results of students' use in education.
The chapter concludes with a discussion of how iPads helped lead to a 1:1 computer ratio within the majority of public schools and the adoption of other technologies in education, like the Google Chromebook.

History of the Innovation

Apple's iPad attracted a lot of attention since its unveiling on January 20, 2010, and its release in March of the same year. The concept of the iPad and its features created a device that became adopted in the K-12 educational setting. Even after twelve years, the iPad is still utilized in education, and research will show that the device can positively impact learning.

The iPod, iPhone, and iPad were released within ten years, between 2001 and 2010, by the iconic American technology company Apple. Apple was the first company to reach $1 trillion in capitalization and is one of the most valuable brands in the world. Apple was created in 1975 by Steve Wozniak and Steve Jobs. Wozniak was considered an electronics genius, and Jobs was a business leader and innovator. Under their leadership, Apple created a new market for a misunderstood product. After its unveiling and before its release, computer specialists and journalists predicted the iPad would not be successful and recommended that their audiences not purchase the device (Viruena, 2019).

The experts were wrong. When the iPad was released in 2010, it sold three million units in eighty days (Apple, 2010). There are several reasons that the iPad was appealing. Apple did a fantastic job marketing the iPad. Instead of targeting current Mac users, Apple targeted iPhone users (Viruena, 2019). The iPad earned the nickname "the big iPhone" because the iPad was a mix between a personal computer and a smartphone. The iPad was never designed as a replacement for the iPhone. It was only meant to enhance the iOS experience.
Apple focused the release of the iPad on 2.5% of the people in society, known as the innovators (Sorman-Nilsson, 2012). By targeting the innovators, Apple created a wave of excitement. This exclusivity even caused the innovators to camp out and be the first to purchase the device. Limited availability added to the exclusivity. The influx of iPad sales created a waiting period for early adopters. The early adopters who wanted the iPad had to wait because the device had become so popular. After the initial wave of excitement, Apple relied on user-generated reviews to help convince the early majority, late majority, and laggards to purchase the iPad. One such review showed an infant quickly navigating the iPad while making sounds of pure enjoyment (Hochberg, 2011). This video soon amassed millions of views and was even shown on NBC's "Today" show.

The iPad created a new market composed of a diverse audience of all professions and age groups. The marketing campaign and exclusivity created excitement for the device, and the features of the device were attractive, powerful, and easy to use. The iPad had a gorgeous aluminum and glass design, a 1GHz Apple A4 processor, different storage options (16 GB, 32 GB, and 64 GB), and ten hours of battery life (Costello, 2020). The iPad was sleek, portable, lightweight, fast, easy to use, and contained a touch screen. The first iPad did not have a camera, and the device was not cheap. Its starting price was $499. As of July 2022, iPads range from $329 - $799. The newer iPads have various features that keep the iPad competitive with other tablets. All generations of iPad except the first generation contain a camera.

The conceptual idea of the iPad began before the iPhone. However, the first iPhone was revealed in 2007, several years before the first iPad. The idea behind the iPad was simple. Apple wanted to create a computer that resembled a book. Apple wanted this computer to be simple to learn. Apple also envisioned a computer that did not need to connect to anything (Hillard, 2018). The iPad was intended to operate without needing additional wires, cords, or connectors. With its ease of use, battery life, ease of transport, and the ability to
download and purchase a wide variety of educational apps, the iPad attracted the attention of educators.

**Adoption of the iPad**

The adoption of the iPad began at its unveiling in January 2010. During the launch, Steve Jobs used words like "revolutionary," "amazing," "new," and "incredible" (Sorman-Nilsson, 2012). This event was broadcasted as a live event and served as a sales pitch for the iPad. Jobs went on to demonstrate the ease of use of the iPad during the event. By doing so, he established a straightforward adoption use case for the device.

**Figure 1**
*Roger's Classic Adoption Curves and the Apple iPad*
The iPad adoption would follow the typical S-Curve adoption rate as described by Rogers, see Figure 1 (Rogers, 2003). When Apple went to the market with the iPad, it focused on innovators. These innovators sometimes stood outside Apple stores for days, waiting to purchase the iPad. These innovators were vital in the success of the iPad, and excitement and buy-in were created due to exclusivity and limited availability. The innovators wanted to be the first to own and use the iPad. Limited availability produced a reward-like scenario when the innovators were finally able to purchase the iPad. As a result of the excitement, the innovators created videos and shared their experiences using the iPad.

In K-12 education, select teachers and technology leaders served as the innovators during this adoption phase. The teachers and technology leaders, who were part of the initial wave of purchasers, tested the iPad with select groups of students or other teachers to evaluate the benefits of the iPad in education. These educational innovators would have downloaded any available apps and shared their experiences with their colleagues. Teachers and technology leaders would share positive experiences with the iPad, such as virtual field trips, assistance in science exploration and simulations, and conducting assessments to improve student performance. These educational innovators would have either used their personal iPad or received an iPad for testing from a technology department or media center in their school district.

The second phase of diffusion and adoption of the iPad is when Apple's idea went from 2.5% and added 13.5% of the market. During this phase, early adopters joined the innovators. Innovators join when the product is new: early adopters buy in once they perceive a benefit (Rogers, 2003). Together, they make up 16% of the market. Having 16% of the market is not considered a success. 16% was a meager number when Apple was looking for most of the market. Included in the 16% are the change makers. These change-makers became advocates for the iPad.
So, who are the change-makers in education? The change-makers in education could be a range of various roles. It could be teachers, administration, technology leaders, or any staff actively advocating for continuous school improvement. The change-makers would see the potential benefits of using the iPad in education and want to use the iPad to improve student learning and achievement. At first, the change-makers would have been curious. They would have found ways to use iPads in the educational setting. These change-makers were active members of the school. They participate and stay engaged in furthering the mission of the school or school system. Most importantly, the change-makers would have modeled and shared their beliefs. They would share their experiences with their colleagues in a positive way.

As described by James and Schirtzinger, the point of most significant difficulty for the diffusion and adoption of a technology product is the transition from the early market to the market dominated by a larger group of customers (Schirtzinger, 2020). If the technology is not adopted, it falls into the Chasm described by Moore. Moore defined a chasm between early adopters and the early majority, and successful products must get across the Chasm (Moore, 2009). The iPad successfully leaped across the Chasm in K-12 education quickly after its release. The numerous features of the iPad made it beneficial to both educators and students (Harrison, 2010).

The subsequent adoption phase links innovators and adopters with the early and late majority (Rogers, 2003). At this phase, the early majority was not interested in the keynote address by Steve Jobs. The early majority join when there is a productivity gain. For the early majority to join, they need social proof of the iPad's usability and to observe the benefits. The innovators and early adopters created social proof, and their love of the iPad eventually helped Apple achieve 68% of the market (Sorman-Nilsson, 2012).

If you were to look at the percentage of teachers as staff members in a school district, you would find that teachers make up between 40 and 60 percent of the staff (National Center for Education Statistics, 2018). Teachers would make up a large percentage of the
early and late majority. The early majority in education would have observed the benefit of the iPad and then wanted to use the iPad in the educational setting. Perhaps a music teacher wanted to utilize an iTunes playlist. A science or social science teacher may wish to warm up a class using a TED video. Any teacher or staff member could have used the early video conferencing applications like Skype. Many of the early majority would have found a benefit of now estimated two million applications available for download (Apple, 2022).

Five essential factors are critical for the early and late majority to adopt (Rogers, 2003). The iPad must have a relative advantage and keep an edge over comparable products. The iPad must be compatible to be assimilated into an individual's life. The iPad must be easy to use. If it is too complicated, people are unlikely to adopt it. There must be a way for the iPad to be experimented with or its trialability. Trialability for consumers is tested in the Apple store. Educator's trialability took place when experimenting with an iPad in the educational setting. Lastly, iPads must be visible to others and attractive. These five factors fueled the adoption of both the early and late majority.

After the early majority adoption phase is the late majority adoption phase (Rogers, 2003). The late majority would only adopt the iPad once there is plenty of help and support. At this stage, the iPad would have uses beyond media consumption. Many of the late majority adopt the iPad as it benefits their professional lives. Much like the early majority of the iPad in the educational setting, the late majority is made up of mostly teachers and some other staff. The late majority benefitted from other educators' experimentation with the iPad and then decided to use it to enrich their lessons.

The laggards tend to be the last to adopt an idea (Rogers, 2003). Laggards have little to no influence on leadership. Laggards tend to distrust change makers. The laggards do not want to feel left behind and thus eventually adopt the idea. The laggards are some seasoned veteran teachers in the educational setting. These educational professionals are set in their ways and have a set of designed lessons. With the iPad, the laggard educational professionals would have
resisted change until they had to join or were forced to participate by department heads, administration, or state standards.

**Benefits and Barriers in the Educational Setting**

The iPad was marketed for education as a textbook replacement (Kien, 2014). Apple's premise was that conventional paper textbooks hold students and teachers back from their full learning experiences. Apple felt that the weight of books and the old way of flipping pages were inadequate compared to the iPad's portability, graphics, and interaction (Kien, 2014). Apple declared that the iPad would make learning fun, and the student would gain a "study partner." However, the iPad served as much more than a textbook replacement. The iPad replaced the need for larger, more expensive devices like laptop computers. These benefits all served as reasons for the adoption of the iPad. This next section will outline the features of the iPad while looking at the benefits of its use in education and the barriers to its adoption in education.

The features and characteristics of the iPad make it an educational tool that can assist with learning in K-12 education. The height and width of the iPad resemble a children's book. iPads have a screen size of over ten inches, a multi-touch screen, and high pixel resolution. The iPad can also be viewed at 178 degrees both horizontally and vertically and can be switched between different viewing positions (Apple, 2016). The iPad is thin and lightweight, making it an effortless device to transport and handle.

A significant benefit of the iPad is mobility. Now, various forms of technology are used in education settings. In the early phases of adoption, smaller devices such as personal digital assistants or smartphones could have provided the user with a personal experience but did not support interpersonal and collaborative learning. It is possible that students would not achieve the same learning experience and involvement as they could on a device with a larger screen. Chromebooks are cheaper than laptops and weigh less but did not originally contain a touchscreen. This limited entry-level Chromebooks to interaction solely with a mouse and keyboard. More
expensive Chromebooks included touchscreens. The most recent iPads have child-friendly design features such as a touchscreen, voice controls, switch controls, assistive touch, and alternative input. iPads contain hardware keyboard support, accessibility keyboard, back tap, touch accommodations, Siri, dictation, and predictive text. The iPad does not rely on the mouse and keyboard but does have the hardware to support one if needed.

Increased motivation and engagement are other benefits of the iPad. Unlike the conventional textbook, the iPad offered seamless learning. Seamless learning is the idea that students can learn whenever and wherever they are curious (Henderson & Yeow, 2012). This serves as a catalyst to increase student motivation. The iPad provides fast and easy access to information. Using an iPad allows students to move around and communicate with others physically. Portability enables students to explore any subject in any given location. Perhaps the most considerable engagement benefit is direct feedback. Students can receive immediate feedback when interacting with content on an iPad. This is not the case with conventional textbooks. The iPad increases engagement by encouraging students to be more creative. Students can do everything from digital drawing, filming, editing, graphics work, and presentation creation. Collaboration is enhanced when students utilize an iPad. Teamwork is promoted since it can simulate face-to-face social interaction. After the first generation, all iPads contained a camera and video editing software, allowing communication to occur locally or globally. New education applications constantly emerge from the App Store. The iPad has several thousand educational applications available for download via iTunes via Apple's App Store (Apple, 2022). While some apps are free and some are paid, the iPad can connect educators to various education applications across every discipline.

Differentiation and individualized lesson planning have become increasingly popular teaching pedagogies. The iPad can help teachers make both concepts easier to implement in the classroom. Students have different learning preferences, and iPads can serve as a tool for educators to customize learning based on their needs. For example, if
one student is a visual learner, they can watch educational videos. Kinesthetic learners could download and practice problems or participate in a simulation to learn similar content (Fleming & Mills, 1992).

Along with the potential benefits of mobile technology, there are downsides. There are many reasons the iPad was adopted in the education setting. There are also many barriers that the iPad encountered during its adoption and use. This next section will discuss the obstacles to the adoption of the iPad. Between 2011 and 2016, educational research showed that iPads were a potential distraction between students and their peers (Daley, 2017). While the iPad was intended to create collaboration, studies found that the iPad led to decreased academic performance and attention awareness. Listed in the study were reports of students using the iPad for shopping, gaming, and social media. Educators have less control over students who may be able to use instant messaging, play games, cheat on assignments, and visit inappropriate websites. Of course, this could occur if the device is not controlled.

The biggest drawback of adopting the iPad is the lack of equal access for all users. In 2010, only 76 percent of homes in the United States had internet access (Perrin & Duggan, 2020). Today, that number is close to 85 percent (Perrin & Duggan, 2020). But what about the other 24 percent in 2010 and 15 percent today? Not every student would have equal access to the internet. The lack of equal internet access and connectivity is still the most considerable drawback of adopting the iPad in education.

Another major setback for the adoption of the iPad is that not all educators are equipped with the pedagogical strategies needed to be effective. All adopters would need training on fully utilizing and facilitating an environment for using iPads in education. For the laggards, new technology can be viewed as an unwanted intruder that alters the traditional ways of teaching. Laggards would resist the technology.

Early iPads lacked essential features and lacked technology support in education. For instance, the first-generation iPad did not
have printing capabilities. Technology departments in schools were not prepared to allow educational apps to be downloaded. There were no measures to view student usage (Daily, 2017). Many times, resources were blocked, or the opposite, resources were too widely available. Students figured out how to bypass security measures and gained access to prohibited websites and apps. Technology departments were also ill-equipped to handle the technical difficulties and provide support during the early years of iPad adoption.

While many studies showed that the iPad increases student creativity, one study showed that the iPad decreases creativity with traditional drawing methods (Daily, 2017). This particular study compared the drawing results of students who drew with a pen-on-paper and those who drew on an iPad. The researchers found a significant decrease in the graphic scores in the iPad drawings. The result showed that the students are more likely to draw detailed artistic drawings with the traditional method.

The big adoption question is whether or not it is cheaper to replace the traditional textbook with iPads. A recent study figured it would cost roughly $180,000 to replace the average high school class's paper textbooks (Hein, 2015). Switching to iPads would cost them $430,000. The textbooks require a replacement around every five years. However, the replacement of iPads could be around the same timeframe. With textbooks being roughly 41% cheaper than iPads, this is a significant setback for adoption. Most school districts would opt for more affordable devices like Chromebooks.

**Impact on Education: Results**

Apple, the marketing geniuses, produces impact statements for the iPad in education. These impact statements give an overview of the device's impact in the educational setting using case studies from specific schools throughout the United States (Apple Inc., 2010). The impact statement should be viewed as a marketing tool covering academic performance, engagement, and motivation. The case studies presented in the impact statement make a compelling argument for adopting iPads in the educational setting. While the iPad could have
impacted these results, experienced educators will understand that many of the results listed are not solely based on adopting a single technological device. It should also be noted that some achievements may be challenging to measure, like higher-order thinking in high school students. The tables below summarize Apple's impact statement from 2019 (see Tables 1 & 2).

**Table 1**

Apple's Learning Effectiveness Use Case Academic Performance

<table>
<thead>
<tr>
<th>Location</th>
<th>School Name</th>
<th>Result(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coppell, Texas</td>
<td>Richard J. Lee Elementary School</td>
<td>Increases in reading and math scores in Grades 3-5. Increase in science for Grade 5.</td>
</tr>
<tr>
<td>Southwest Ranches, Florida</td>
<td>Archbishop Edward A. McCarthy High School</td>
<td>National Merit acknowledgments increased 200 percent.</td>
</tr>
<tr>
<td>Waco, Texas</td>
<td>Bell's Hill Elementary School</td>
<td>Improved State of Texas Academic Readiness (STAAR) assessment scores in Grades 3-5</td>
</tr>
<tr>
<td>Liberty, Missouri</td>
<td>EPiC Elementary School</td>
<td>Increase using iReady scores; 33 percent increase in reading, 44 percent increase in Math</td>
</tr>
<tr>
<td>Location</td>
<td>School Name</td>
<td>Highlights</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Oceanside, California</td>
<td>T.H.E. Leadership Academy</td>
<td>Gains in state assessments and a 50 percent decrease in disciplinary incidents</td>
</tr>
<tr>
<td>Fort Myers, Florida</td>
<td>Bishop Verot Catholic High School</td>
<td>Increases in SAT scores and increases in college scholarships</td>
</tr>
<tr>
<td>Austin, Texas</td>
<td>West Ridge Middle School</td>
<td>Increases in Grade 6-7 math exams</td>
</tr>
<tr>
<td>New York, New York</td>
<td>Marymount School of New York</td>
<td>All seniors graduate on time and go to college since the adoption</td>
</tr>
<tr>
<td>Harlingen, Texas</td>
<td>Zavala Elementary School</td>
<td>Improved State of Texas Academic Readiness (STAAR) assessment scores in Grades 3-5</td>
</tr>
<tr>
<td>Johnston, Iowa</td>
<td>Johnston High School</td>
<td>Claim students are 50 percent more engaged with higher-order thinking</td>
</tr>
<tr>
<td>Orange, California</td>
<td>California Elementary School</td>
<td>58 percent gains in student literacy</td>
</tr>
<tr>
<td>Mineola, New York</td>
<td>Mineola Middle School</td>
<td>Increased reading and math scores on state assessments</td>
</tr>
<tr>
<td>Location</td>
<td>School Name</td>
<td>Result(s)</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Orland Park, Illinois</td>
<td>Meadow Ridge School</td>
<td>Increase class time spent on higher order thinking activities</td>
</tr>
<tr>
<td>Senatobia, Mississippi</td>
<td>Magnolia Heights School</td>
<td>97 percent of students feel more engaged, 91 percent are more confident using technology, and 97 percent of their school excels compared to other schools</td>
</tr>
<tr>
<td>Claremont, California</td>
<td>San Antonio Continuation High School</td>
<td>Decreases in student suspensions</td>
</tr>
<tr>
<td>Compton, California</td>
<td>Thomas Jefferson Elementary School</td>
<td>Decrease in chronic absenteeism</td>
</tr>
<tr>
<td>Cerritos, California</td>
<td>Valley Christian Middle School</td>
<td>Positive results of student surveys after the 1:1 adoption of iPads</td>
</tr>
</tbody>
</table>
While discussing the impact of Apple's iPad on education, it is essential to look at two cases involving the adoption at a 1:1 ratio (such that each learner is assigned a device). Burlington High School in Burlington, Massachusetts, was one of the first high schools to launch over 1,000 iPads to all incoming freshmen in 2011 (Marcinek, 2010). Burlington installed Casper profiles on all iPads to track student usage based on student identification numbers. The Casper Suite allowed educational organizations to support, update, and monitor the use of iOS devices (JAMF Software, 2012). Burlington did not produce any facts or figures claiming that the iPads increased state standards or student motivation; however, Burlington is still adhering to the 1:1 ratio of iPads to students. This indicates that iPads in the school district have many advantages. Here is what Burlington discovered with their 1:1 adoption of iPads:

1. Using iPads to replace textbooks simply did not utilize the features of the iPad, and thus the device never reached its full potential.

2. Not every student was ready to adapt to technology. Many students preferred learning in the analog world.

3. Students had to be trusted and created a support system for technology issues

The Los Angeles Unified School District is the second-largest school district in the United States and serves over 600,000 students. The Los Angeles Unified School District failed with the adoption of iPads in 2011 (Lamb & Weiner, 2018). To summarize this case study, a new superintendent was hired for the district in 2011. This superintendent worked with Apple and began rolling out iPads to students in August 2013. Instantly the school district reported problems with student security. Over 300 students at multiple schools deleted their security profiles. As a result, iPad usage was restricted to on-campus only. At the same time, teachers reported issues with device inconsistency. These issues included connectivity, lack of
support, misaligned curriculum, and problems with the Pearson app. The Pearson app was supposed to serve as the replacement for textbooks and the main reason for use on the iPads. Faced with all of the issues, the superintendent pushed back the second phase of the rollout, ended the program, and resigned. The innovation was too immature at the time to support such a large-scale diffusion.

When technology is adopted, it must have a well-planned support system in place. This was not the case with the Los Angeles Unified School District and ultimately led to its failure. In their memo to California's Board of Education, the superintendent stated that one of the reasons the district terminated its contract with Apple was to take advantage of the ever-changing marketplace.

**Paving the Way for Other Devices**

Studies between 2011 and 2016 look at how iPads have positively and negatively changed student learning in the classroom (Daily, 2017). In 2017, most research studies investigated how schools began to shift away from using iPads and adopting Chromebooks (Daily, 2017). Why did this shift suddenly take place? This next section will examine how Chromebooks became the more frequently utilized device in education. And while Chromebooks may have a slight advantage in the market today, their use in education may not have happened if the iPad had not paved the way for their adoption.

One thing that certainly comes to mind when purchasing an Apple product is price. While Apple does have separate pricing for educational institutions, it is still more expensive than Google Chromebooks. A base-level iPad could still cost a school division around $300. Chromebooks charge $200, or schools can pay $20 per month. This monthly plan includes all hardware and software support and replacement of the Chromebook after three years.

The iPad has device limitations. One major limitation is the lack of a mouse and keyboard (Kucirkova, 2014). School districts recommend using the iPad for early grades, but older students require using the mouse and keyboard for writing and while taking state
assessments. This causes school districts to prefer Chromebooks over iPads.

With Apple, IT departments can utilize Apple School Manager. The implementation is straightforward and customizable. Apple grants 24/7 support through AppleCare. The iPad must be sent to Apple for repair if there is a hardware issue. This is one downside to technology management. With Google, the G Suite for Education allows unlimited users. These users can log into everything they need from apps, settings, books, videos, and class assignments. Google allows admin controls. Administrators can determine what applications can be accessed, installed, or blocked. Google Chromebooks offer 24/7 support.

Educational institutions adopting technology before 2020 may have been influenced by the Flash support that Chromebooks contained. From 2011 until 2020, iPads could never support Adobe Flash. Chromebooks did incorporate flash support. On December 31, 2020, Adobe stopped supporting Adobe Flash. The lack of support for Flash video could have prevented the early majority from adopting iPads.

**Effectiveness of 1:1 Implementation**

Schools have implemented 1:1 programs for over twenty years. A 1:1 program is best defined by an educational institution that provides one technology device for every student (Sauers & McLeod, 2018). Are these 1:1 programs effective in increasing student achievement and engagement? Earlier in the chapter, a Burlington High School case study regarding the 1:1 adoption of iPads was investigated. This case study demonstrated mixed results with implementing one iPad for every student. But, what does other research reveal? Research has shown that teachers favor school-connected and personally connected devices. For these programs to work, educators prefer guidance on the best use of the devices and adequate technology support (Luo & Murray, 2018). Drawbacks exist with 1:1 programs, including students using the devices for non-productive personal use. One study showed that
students who participated in 1:1 programs did demonstrate a higher level of technology competency (Sauers & McLeod, 2018). Unfortunately, the research on 1:1 programs is lacking, and the results are mixed (Gherardi, 2020).

Summary

The iPad was not the first tablet; several personal digital assistants and tablets were before the iPad. Tablets such as the Linus Write-Top, GridPad, MessagePad, PalmPilot, and Windows XP Tablet, came into existence before 2010 (Bort, 2013). So, what fueled the adoption of the iPad in education? The answer to this question lies within the marketing campaign and the device's features. The marketing of the iPad was well-planned and executed. Apple targeted innovators and released the product with limited availability. This created excitement and exclusivity. Soon user-generated reviews started free advertisements for the iPad. But marketing did not fuel the use of the iPad in education. The features of the iPad made it an excellent choice for educators. The iPad was lightweight, easy to use, connected without wires, had long battery life, and was attractive. Plus, the iPad is connected to the App Store, which contains 2+ million education applications.

The iPad adoption in education follows the typical S-Curve adoption rate described by Rodgers. Early adopters used the iPad once they saw the potential benefit of bringing the device into the educational setting. The innovators tested the iPad with select groups of students. The early majority began using the iPad once they observed social proof of its benefits. The late majority started using iPads in education once help and support systems were in place. Finally, the laggards adopted the iPad so they would not be left out or were forced by the educational administration.

The iPad has several benefits and several barriers to adoption in education. The benefits included an advanced touchscreen, lightweight portability, and various accessibility features. The iPad is
able to increase student motivation and engagement, improve collaboration, help teachers individualize lessons, and has a lot of content readily available from the App Store. However, the iPad can be a distraction in education because it is hard to control. Some studies showed a decrease in academic performance. It is costly, and teachers lack the training to utilize the device to its full potential. The most significant barrier to iPad adoption is the simple fact that not everyone has equal access to this device.

Several studies show the iPad has positive impacts in the education setting. These studies highlight academic performance, student engagement, and student motivation. However, the iPad has lost the majority of the market share in education to Chromebooks (Swartz, 2016). Chromebooks, and similar tablets to the iPad, share many similarities. These similarities include a robust application store, easy connectivity, and portability. Many of the Chromebooks and clone devices even have similar aesthetic features. The main reasons Chromebooks surpass the iPad in education are cost and IT management. Also, Chromebooks are easier to control and supply students with everything they need in the G Suite for Education. They also include built-in keyboards, which would be an extra accessory on the iPad and another aspect of the support workload.

It will be interesting to see what educational technology trends emerge following the years of virtual and hybrid learning created by the COVID-19 Pandemic. Will Chromebooks lose favor to a new device? Will Apple find a way to revamp the iPad so it becomes a more favorable device in education? Either way, the iPad will always be remembered as the device that was supposed to fail and ended up enriching the lives of millions of educators and students.
References


Many studies show that the not allowed them to do.


