Creating a Content Strategy for

Mobile Devices

in the

Classroom

Center on
Innovations
in Learning

by
Karen Mahon

www.centeril.org

TEMPLE
UNIVERSITY®

Creating a Content Strategy

for

Mobile Devices

in the

Classroom

Karen Mahon

Acknowledgements

TABLE OF CONTENTS

What Now?

I n the fall of 2013, Apple CEO Tim Cook announced that the number of apps in Apple's iTunes store had reached one million (The Verge, 2013). With more than 230 new apps of all kinds submitted to iTunes every day, the number of apps identified as "educational" in the iTunes store has now grown to a staggering 122,000 (148Apps, 2014).

Now put these numbers in the context of children's access to and, presumably, use of mobile devices and apps at home, access which has grown explosively over the last several years. According to a recent study published by the Brookings Institute (West, 2013), 18% of children in Grades K–2 have access to a smartphone, and 26% have access to a tablet device; 45% of third through fifth graders have access to smartphones, and 48% have access to tablets; 65% of sixth through eighth graders have access to smartphones, and 52% have access to tablets; 80% of ninth through twelfth graders have access to smartphones, and 45% have access to tablets. These percentages—up dramatically from just a few years ago—continue to grow daily.

The use of mobile devices presents a similar trajectory in U.S. schools. According to PBS LearningMedia (2013), tablets and e-readers saw the biggest increase among technology platforms available for classroom instruction between 2012 and 2013. In February 2013, more than one third (35%) of teachers said they had access to a tablet or e-reader in their classroom, up from 20% a year previously. Among teachers with access to tablets, 71% cited the use of educational applications as the most beneficial for teaching. Currently, about 10 million tablet devices are being used in schools and other educational settings.

Whenever a large purchase of mobile devices is made for education, the very next question asked is, "Now what?" The concerns up and down the hierarchy of the education system, as devices are implemented, vary. Teachers are concerned about the practical issues of using devices with students and selecting content that helps students learn. School and district administrators want to ensure that their purchasing dollars have been used meaningfully and that the devices are being used regularly in the classrooms. And state department of education personnel want to know that the implementation of new technologies is helping the students of their state perform at grade level, prepare for college and careers, perform well on standardized tests, and compete favorably with students from other states.

But in order for all of these levels of concern to be addressed successfully, the fundamental question of "Now what?" needs to be addressed immediately when the

devices arrive at an individual school or classroom. It is the planning for and using of the devices as part of an overall approach to the curriculum, locally, that will determine how the interests of different stakeholders are satisfied…or not.

This practice guide is intended to help stakeholders in the following ways:

- To assist teachers, curriculum and technology specialists, and administrators plan and implement the use of mobile devices and content in schools and districts.
- To help administrators understand the content and implementation planning that is required for a successful mobile device implementation before they make a large expenditure on hardware, lest that outlay of money be a waste in the absence of a larger strategy.
- To give state education agencies insight into what happens in local schools' and districts' planning for content and curriculum as part of a mobile device implementation.

The following assumptions have been made in writing this practice guide:

- A purchase of mobile devices, a decision about what type of mobile devices to buy, or a decision to implement a bring-your-own-device (BYOD) program in the school or district has already been made.

Just beginning the process of mobilizing classrooms? Here are a few web resources to help you get started:

Creating a School Technology Plan
- National Center for Technology Planning: http://www.nctp.com
- Universal Service Administrative Company: http://www.usac.org/sl/applicants/step01/
- North Central Regional Education Laboratory: http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te300.htm

Deciding on Devices for a School
- eSchool News: http://www.eschoolnews.com/2014/03/04/choosing-right-mobile-devices-schools/
- K12 Digital Decisions: http://k12digitaldecisions.com

Considering a BYOD Plan
- EdTech Magazine: http://www.edtechmagazine.com/k12/sites/edtechmagazine.com.k12/files/111331-wp-k12-byod-df.pdf
- K-12 Blueprin: http://www.k12blueprint.com/byod
- TeachThought: http://www.teachthought.com/technology/20-byod-resources-for-21st-century-school/

- A technology plan that addresses the technical aspects of a mobile device implementation—such as sufficient broadband, networking of devices, and device management—has already been established.
- The reader is at the point of asking, "Now what?" in addressing content and curriculum in the implementation of mobile devices in individual classrooms.

So let's begin with preparing yourself, your classrooms, and your learners.

Preparing to Select Content

Before selecting particular digital content to use on the devices in the classroom, the teacher or technology director must familiarize herself with some of the technical aspects of the devices she will be using. These technical aspects will provide information that will help in selecting appropriate digital content that is compatible, technically, with the devices a school has purchased.

Technical Issues

Hardware features and functions (and perhaps limitations) will influence what you and your learners will be able to do with content and how you do it. This first section is about getting to know your device(s) and some background information you'll need to know as you prepare to build a content strategy.

What Platform Are You Using?

Before even thinking about content, make sure you know what platform (also known as "operating system" or "OS") your device uses and where to shop for content (known as "apps," short for "applications") for that platform. The technology director at your school or district can help you with this. The four major platforms and their online "stores" are:

- iOS – iTunes: https://itunes.apple.com/us/genre/ios/id36?mt=8
- Android – Google Play: https://play.google.com/store/apps?hl=en
- Chrome – Chrome Web Store: https://chrome.google.com/webstore/category/apps
- Microsoft Apps for Windows: http://windows.microsoft.com/en-us/windows-8/apps#Cat=t1

Until recently, iOS-based apps comprised the largest number of educational apps, but iOS numbers have been eclipsed as other platforms' offerings have grown. In March 2014, iTunes reported having more than 65,000 educational apps for iOS, but, a month earlier, the number of education apps for Android had surpassed 77,000 (AppTornado GmbH, 2014). Chrome and Microsoft are newer entrants to the mobile device industry, and estimates of the number of educational apps in those stores were not available at the time of this writing.

If your school or district is implementing a bring-your-own-device (BYOD) program, the issues are more complex. You are faced with either choosing apps that are cross-platform (i.e., built to run on more than one platform) or with choosing different

apps for different platforms. Either course may not be easy. In the first case, there are still relatively few educational apps that are developed for multiple platforms; in the second case, search time will be multiplied by the number of platforms you are trying to accommodate. We'll talk more about selecting apps shortly, but in the case of BYOD, make sure that you know all of the platforms you must accommodate.

What Devices Are You Using?

Even if your school or district has adopted a particular operating system within a BYOD program, you may still be confronted with a wide range of possible devices. With iOS, there are only a few devices, all manufactured by Apple (iPhone, iPad); but if you are using Android, for example, you may be using a device that is manufactured by Sony, Samsung, HTC, Amazon (i.e., Kindle), Barnes and Noble (i.e., Nook), Google, and many others. Why does the device and its manufacturer matter? Well, when developers create apps, they are usually optimized for particular devices or screen sizes. For example, an app that is optimized for an iPhone will not display as nicely on an iPad as will an app that is optimized for the iPad. And an app that is built specifically for the iPad won't run on an iPhone at all. Similar types of incompatibilities exist among the different manufacturer's Android devices. So you'll want to be aware of the specific devices used by your students as you start considering the apps that you want to use. When you shop in an app store, you will find a list of all of the devices for which a given app is optimized. Make sure that an app runs on your device(s) before purchasing it.

What Operating System is Running on Your Device(s)?

If you are using an Apple device, determining the operating system (OS) is fairly straightforward because Apple only has one operating system, iOS, and it is updated periodically; each version is referred to by number, for example, "iOS 7." When selecting an app, the user should choose an app that supports the current operating system running on the device or an earlier version of the operating system that is still supported by the device (for information on how to check the current iOS running on your device, go to http://support.apple.com/kb/ht2188). The same operating system runs on iPhones and iPads, but apps may be optimized for one device or another. Apps that are optimized for iPad cannot run on iPhones; apps that are optimized for iPhone, however, do run on iPads (the graphics are optimized for the smaller screen size so they may appear grainy when displayed on the iPad at approximately twice the optimal size). Many developers optimize for both the iPad and the iPhone. Updates to the iOS operating system are free and the user is alerted, on the device, when an update to the operating system is available. Updates do not happen automatically, but must be initiated by the user.

If you are using an Android device, determining the OS is more complicated because different device manufacturers support different versions of the AndroidOS. So, you will hear about Android operating systems such as "Ice Cream Sandwich," "Jelly Bean," and, most recently, "KitKat." You'll need to check and see which version of the operating system your particular device supports. If you are an Android user who shops in the Google Play store, once you synchronize your device with the store, the device will automatically tell you if the app will work on your particular device.

Purpose of the App to be Selected

After you've got the essential technical issues under your belt, the next set of questions has to do with why you're looking for an app. It's best to know what you're trying to accomplish with an app and what functions or coverage you're looking for before going into the app store, where you'll undoubtedly be drawn under the spell of all of the really cool-looking apps that are available. In fact, at a recent event held by Google that I attended, teachers, parents, and kids alike said that one of the major factors in their choosing an app was the attractiveness of its icon. It's sort of the technology equivalent of going to the grocery store when you're hungry!

Educational apps fall into four basic categories based on their purpose: instruction, creativity, tools, and books. Which type of app you select will depend on what you expect the learner to do *with* an app or what you expect an app to do *for* a learner. Here's the breakdown:

Instruction

Apps devoted to instruction aim to teach particular skill sets to learners, establishing initial, simple performances and then building increasingly more complex performances. These apps explicitly teach new skills to learners or help learners gain expertise with those skills. The majority of subject-specific apps fall into this category. Some well-known examples include DragonBox Algebra 5+ (WeWantToKnow AS, 2014), Learn with Homer (Homer-Learning, Inc., 2014), and LetterSchool (Sanoma Media Netherlands B.V., 2013).

When developers create apps, they are usually optimized for particular devices or screen sizes. Even on devices made by the same manufacture, some apps don't display well on differently sized screens, and some apps made specifically for one device won't work on another.

Creativity

Also known as "productivity apps," creativity apps allow learners to extend and apply their skills to novel situations and make their own "stuff." These apps do not provide explicit instruction; instead, they provide a virtual sandbox in which learners create their own experience, using skills that have been established previously. Creativity apps enable learners, for example, to make their own e-books, tell a story, assemble a presentation, draw pictures, compose music, or make movies. In these apps, the learning objectives are less specific than those in instructional apps, but learners still must have the necessary entry-level skills for the given creativity app. For example, to use an e-book creation app, a learner would need sufficient writing, reading, spelling, and grammar skills to use it meaningfully. Because learners can produce such a wide array of products using creativity apps, these apps do not provide performance evaluation, which is left to the teacher. Some well-known examples of creativity apps include Explain Everything (MorrisCooke, 2014), Toontastic (LaunchPad Toys, 2014), and Story Creator (Innovative Mobile Apps, 2013).
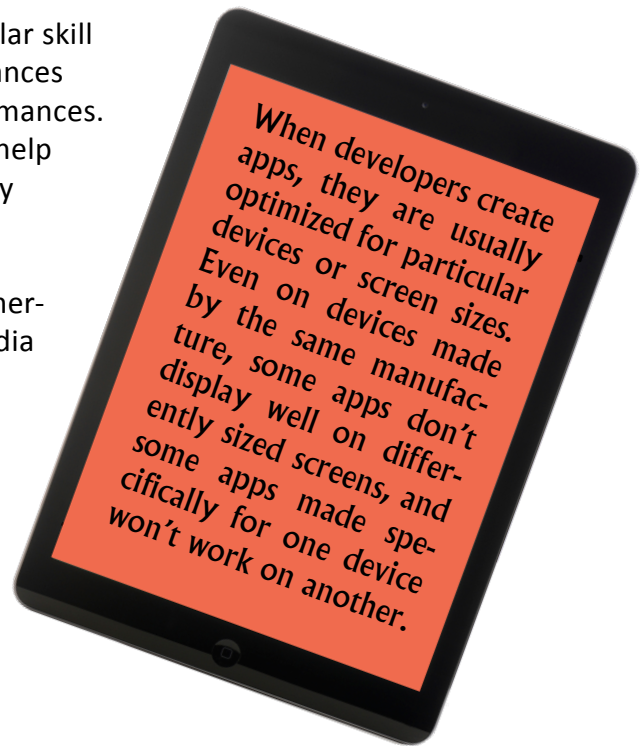
Tools

Tool apps are those that learners can refer to for more information relevant to whatever topic they happen to be studying. These apps might include reference tools, such as dictionaries, calculators, and periodic tables. They might also provide simulations in which learners can observe animated concepts and phenomena at work, such as the scientific principles of acceleration and gravity. The key with apps of this type is that they don't evaluate learner interactions for correctness or quality. Instead, most or all of the information is presented passively to the user. Some examples include World Book: This Day in History (Software MacKiev, 2011), GoSky-Watch Planetarium (GoSoftWorks, 2013), and PBS Kids Video (PBS Kids, 2014).

Books

This category probably seems pretty obvious. Many book apps are just digitized versions of books. But there's also a subcategory known as "interactive" e-books. What qualifies as "interactivity" can vary widely, from simple scrolling from page to page to more meaningful tasks such as identifying of objects on the screen or answering simple questions. There's such a range that the descriptor "interactive" is no guarantee an app in this subcategory will prompt educationally relevant learner responses.

Now that you know the four basic categories of apps, you can decide what you expect of an app. Do you need a learner to acquire a new set of skills? Does a learner already have a set of component skills and now you want her to extend and apply those skills by creating something new? Or perhaps your students just need a reference tool or a book. Whatever the case, identifying the learning objective that will be serviced by an app will facilitate your search.

Selecting Content

If you've ever shopped for and used apps, whether for use in an educational setting or just for your personal use, then you know that not all apps are created equal. And none of us likes wasting time with apps that don't do what we hope they will do…or what the app store description says they'll do! So, this section provides a "checklist" of things that will help identify high-quality apps. The citations accompanying the items in the checklist refer to research studies supporting the importance of that feature. Bear in mind that the more specific the learning objective that you're trying to address, the more closely the app will need to be evaluated to make sure that specific skill is taught. For example, if you want an app that will help a learner solve algebraic equations, that is a more specific skill than is creating a movie or reading a book. Plan on spending more time doing a more complete evaluation for the specific skills. Below, I have listedthe features, by category, that indicate that an app is of high quality.

Instructional/Skill Acquisition Apps

- Feedback: The app provides immediate feedback following both correct and incorrect answers; the feedback is noticeably different for correct vs. incorrect answers (e.g., Azevedo & Bernard, 1995; Van Houten, 1984).
- Adaptive Difficulty: The difficulty of the material increases and decreases automatically, depending on the learner's performance. This adaptation happens on-the-fly, without the learner or an adult needing to change the settings on the app (e.g., Tsai, Kinzer, Hung, Chen, & Hsu, 2013).
- Mastery-based: The app requires the learner to achieve mastery of the current skill set before being allowed to progress to the next level (e.g., Kulik & Kulik, 1990).
- High Numbers of Relevant Responses: The app provides plenty of opportunities for the learner to practice the skills related to the learning objective (e.g., Greenwood, Delquadri, & Hall, 1984).
- Clear Learning Objectives: A skill that a teacher or parent can observe a learner doing is clearly described in the app or app description. This means that what the learner does and the conditions under which the attempt occurs must be defined clearly enough so that two people can agree on whether or not it is happening (e.g., Ericsson & Lehmann, 1996).
- Performance Reports With Actionable Data: Learner performance data are reported with enough detail for a teacher or parent to target problem areas. For example, if the app targets phonics, the report should include details of accuracy with specific letter–phoneme correspondences, not a simple percent correct for the whole skill category (e.g., Wayman, 2005).
- Usability: The app should be easy to use, with simple instructions (either textual or graphic) of how to interact with the interface (e.g., Gerhardt-Powals, 1996). Additionally, the images and sounds included in an app should be relevant to the learning activity, not distracting for the learner (Mayer, Heiser, & Lonn, 2001). And finally, the reading level of the app should be appropriate for the lowest age of learner identified by the app developer (e.g., Hanna, Risden, Czerwinski, & Alexander, 1998).

Creativity/Skill Extension and Application Apps

- A high-quality app includes clear instructions for the user and, if necessary, tutorials (e.g., Gerhardt-Powals, 1996).
- The layout of the screen can be used effectively on a mobile device, with its small screen size.
- The product created by the learner can be exported via common file formats (that will allow the product to be used in other ways—e.g., pdf, doc, ppt) and saved.
- Files—such as images, sounds or movie clips—may be imported into the app.
- The prerequisite skills that the learner will need to use the app effectively are clearly described.
- Preferably, the app allows students to collaborate with each other.

Tools

- The information included in the tool is accurate.
- The tool is intuitive and easy to use (e.g., Gerhardt-Powals, 1996).
- The information is presented clearly.
- The reading level is appropriate to the age of the learner (e.g., Hanna, Risden, Czerwinski, & Alexander, 1998).

Books

- The reading level of the book is appropriate to the age of the learner (e.g., Hanna, Risden, Czerwinski, & Alexander, 1998).
- The content of the book is appropriate for the age of the learner.

How NOT to Select Content

So far, this practice guide has identified what to look for in apps. Almost as important as features to look *for* are selection criteria *to avoid* when choosing apps for your learners.

Familiarity

As consumers, we often buy products from companies with brands that we recognize. In the educational app market, those recognizable brands are often large educational publishers and media companies. But just because these companies make great textbooks, movies, and television shows doesn't necessarily mean they will make great educational apps. Apps produced by these companies tend to be very visually appealing, oftentimes with familiar characters from other media, but are hit and miss with respect to instructional quality.

Price

How many of us have shopped for a product and bought the one that was priced "kind of in the middle," on the one hand, because we didn't really want to spend to buy the *most* expensive option, and, on the other, because the cheap or free options couldn't possibly be good. I know that I'm guilty of that. But in educational apps, *price doesn't predict quality*. At Balefire Labs, we recently ran some analyses of the more than 1,300 app reviews that we've completed. When we ran a correlation between price and quality score, we found that there is *no relationship between price and quality* (r = 0.0547) (Balefire Labs, 2013, October 29). This doesn't mean that you shouldn't spring for apps that you pay for. It just means that you can't assume that an expensive commercial app is any better than a less expensive one, or that either is better than a free one.

The Developer's Description or User Reviews

If you've been to any of the app stores lately, you've probably noticed something: Pretty much all of the apps claim that they will teach your kids. And if you've downloaded any variety of educational apps, you know that's simply not so. And those

"user reviews" that appear below the app description have some problems with objectivity. We would expect that developers' friends and families would post very flattering reviews of a product. But what I was surprised to learn—call me naïve—is that sometimes competitors try to sabotage each other by posting negative reviews in the app stores. It seems to be a widely acknowledged problem in app developer circles. The upshot is this: You can't completely rely on the information in the app store.

Popularity

It's obvious that "Top 10" Charts are based on number of downloads, but for some educational apps, there may be good pedagogical reasons for their reaching the top of the charts. Of course, my colleagues and I at Balefire Labs got curious about that, so we went to one of the app stores and downloaded the top 10 paid apps from the education category and I reviewed them all. We found that we could recommend only *two* of the top 10 apps based on their instructional quality (Balefire Labs, 2013, August 26). So, it's useful to remember that a lot of people buying an app does not necessarily mean it's a good app.

Colleagues' Recommendations

This might be the most tempting option of all. You hear from a friend or colleague or reviewer that the kids *they* work with liked the app, and they're sure *your* kids will like it, too. But here's the thing: Learners like being successful. If kids say they like an app, it's likely to be (at least in part) because they have the necessary skills to use the app successfully. This doesn't mean that kids only like to use apps that are easy for them—quite the opposite. They like to be challenged, just not to the point at which they lack the skills to continue to make progress. Although your colleague's students may have liked an app, their skill levels could be vastly different from those of your students. And that difference will impact your students' enjoyment. So, unless the app being recommended has adaptive levels of difficulty to accommodate all users, be wary.

Special Considerations

'm getting close to turning you loose to select apps...I promise! But first let's talk about special considerations that might be relevant for you.

Alignment to Standards

As more states implement the Common Core State Standards (CCSS), you may want to select apps for particular standards that you are addressing in your classroom. As of now, very few app developers align their apps to CCSS. If this is a priority for you, and you don't want to do the alignment yourself, you are probably best served by finding a reliable website that curates educational apps and provides CCSS

alignment (for which, see the Finding Reliable App Recommendations section later in this guide).

Accessibility

Depending on the device you are using, certain features may be turned on to enhance its accessibility. In the case of iOS devices, for example, some of the accessibility features include:

- VoiceOver: When the user touches the screen, VoiceOver reads what is happening under the user's finger.
- Speak Selection: When the user highlights text in any application and then taps "Speak," Speak Selection reads the selected text aloud.
- Zoom: When the user double-taps with three fingers, this built-in magnifier zooms in 200 percent.

Aside from the accessibility settings provided by the devices themselves, a remarkably small percentage of app developers include customization capabilities to enhance accessibility. Be sure to vet apps completely for accessibility if you have students for whom this is a concern.

Information Safety—Yours and Your Students'

When choosing apps, you'll want to consider a few safety features:

- Does the app include in-app purchases (i.e., purchases that are critical to using the current app, such as buying coins or access to a new level) or access to the app store to buy additional apps? In some cases, purchases can be made without re-entering your login information, so kids may be able to make those purchases without your knowledge or permission.
- Be aware of the links that an app may have to social media. Many apps, including both educational and noneducational, link to online centers that track learner scores; many others link to Facebook and Twitter. While access to these links may enable students to interact and collaborate with each other, in some cases they may allow them to have interactions with strangers (some of whom are likely to be adults). Depending on the device and operating system a school is using, varying degrees of device "lock-down" are available to limit the ability of students to access outside links. Not all teachers and parents opt to lock down kids' devices, but most want to know when these kinds of links are present so that they can have discussions with kids about Internet safety.
- Pay attention to whether or not an app asks to send you "push notifications" (i.e., an alert or reminder that is delivered to the device from the developer) or collect location information. If a developer collects location information, this means that the app company knows the place from which you or your students access its app. These location data do not include any personally identifiable data, but some are still wary about it, so it's useful to be aware of which apps collect it.
- Finally, one of the biggest concerns for teachers and parents is in-app advertisements. These are very common in free apps because developers need some way

of paying for the development costs, so they sell advertising space. The problem is that there have been multiple examples of inappropriate, adult-themed ads appearing in children's apps. The approaches used by developers and by advertising agencies have changed in recent months and these changes seem to have addressed the worst violators, such as adult-themed ads. However, there are still other ads for items that children might like (e.g., other apps or games) that may be a concern for teachers and parents.

Volume Purchasing

If you are purchasing multiple copies of an app for devices in your school or classroom, you should explore your platform's volume purchasing program. Not only will this allow you to buy multiple copies of an app at a discounted rate, but, in most cases, these programs also facilitate mobile device management (MDM). (Note: MDM is the distribution of applications, data, updates, and configuration settings for mobile devices from one centralized location within the school; this is completed via a wireless network.) Here is more information about volume purchasing for the four major device platforms in schools today:

One of the most common complaints among teachers and tech directors in schools concerns the time-consuming task of finding high-quality educational apps.....A better strategy is for schools and districts to rely on educational app review services; there are quite a few and they're easy to search for online.

- Apple Volume Purchase/MDM Program: With this program, multiple copies of an app may be purchased at a discounted rate. Once all devices (which must run iOS7 or later) in a classroom or school are enrolled, the assignment, revoking, and reassigning of apps to and from those devices can be managed centrally.
- Google Play for Education: Similar to the Apple offering, Google Play for Education allows discount, bulk purchasing and centralized management of apps that run on Android devices.
- Chrome Devices for Education: Also owned by Google, Chrome offers volume purchasing and centralized management of apps that run on Chrome devices via its Admin Console, which is accessed by school personnel in charge of the mobile device management program.
- Microsoft Volume Licensing Program: Microsoft offers a volume licensing program to educational institutions and an independent mobile device management program, for apps that run on the Microsoft mobile devices, that must be managed separately.
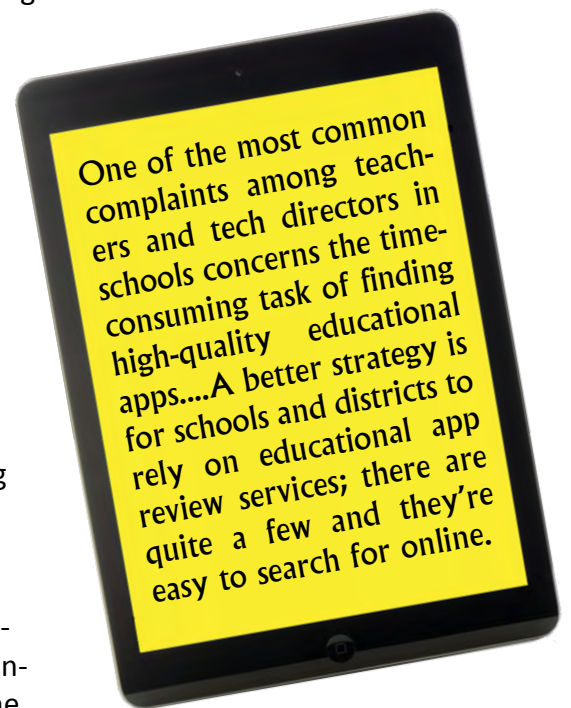
Finding Reliable App Recommendations

One of the most common complaints among teachers and tech directors in schools concerns the time-consuming task of finding high-quality educational apps. With more than a hundred thousand educational apps available between iTunes and Google Play alone, it's no wonder that finding strong instructional apps can seem like a daunting, even impossible task. And yet, in spite of how time consuming the task is, schools and districts all over the country require teachers and tech directors to do all of their own app vetting.

A better strategy is for schools and districts to rely on educational app review services; there are quite a few and they're easy to search for online. Review sites provide curated lists of recommended apps, which allow school personnel to spend a fraction of the time in identifying potential apps, as they only need to vet just the curated list. Different curatorial sites focus on different criteria and have different business models.

Some of the most popular sites include Teachers with Apps (2014), Graphite (Common Sense Media, 2013), Appitic (2014), and Balefire Labs (2014; the author is the president of Balefire Labs). The curators' websites all offer slightly different services: Some are free to the user and supported by advertising and review fees (e.g., Teachers with Apps), some are run by teacher volunteers (e.g., Appitic), others are supported by large corporations (e.g., Graphite), and still others are fee-based subscription services (e.g., Balefire Labs). Appendix I provides examples of reviews for DragonBox Algebra 5+ from each of these four curation sites.

As you shop around for educational app curation sites, here are some questions to ask yourself to help determine which site fits your needs:

- Are the rubrics being used clearly defined and transparent? Can I easily understand how the reviewers decide whether or not an app is good? Is the rubric applied in a systematic way to all apps being reviewed?
- How did this organization arrive at these rubrics? Are they objective or opinion-based?
- How can I meaningfully use the information provided by an app review when I'm working with students?
- Does this organization charge app developers a fee for completing a review? If so, should I be concerned that this is influencing the review the app receives?
- Does this organization take advertising money from app developers? Again, should I be concerned that these monies are influencing the reviews?
- Once you've tried some of the site's recommended apps, ask yourself, What was my experience? Did the recommended apps prove to be useful to my students?
- Does this site offer alignment of apps to the Common Core State Standards?

Establishing an Acceptable Use Policy

Before giving students access to mobile devices, an acceptable use policy (AUP) must be established, setting the standards for how students may and may not use the devices. An AUP can be set at a classroom, school, or district level, depending on the district policy. It is not unusual for students to each sign a copy of the AUP before using a device. In elementary classrooms, in particular, the AUP is often posted.

Each school or district will need to decide what is important in an AUP. AUPs do not need to be set in stone; they can be updated and modified as you identify different needs. The following list presents some suggestions—which are not intended to be exhaustive—of the kinds of items that are often included in AUPs.

- Only use apps and programs your teacher has instructed you to use.
- Do not make any purchases of apps or purchases in apps without the teacher's permission.

- Do not delete anything that is installed on the tablet without the teacher's permission.
- Always know where the tablet is when you are responsible for it.
- Keep liquids and food well away from the tablet.
- Do not put heavy objects on top of the tablet so that you do not break the glass screen.
- Only a soft cloth should be used to clean the tablet screen.
- Be responsible and make good choices using the tablet.
- To extend battery life, always turn the tablet off after completing work.
- Do not expose the tablet to extreme hot or cold.
- The volume on the tablet should remain off unless headphones are connected to the tablet or you have the teacher's permission to turn it on.

For small children, consider the following for the AUP:

- I will always carry the tablet with two hands.
- I will always wash my hands before using the tablet.
- When the teacher [does X], I will stop what I'm doing, put the tablet down and pay attention.

For older students, consider these requirements in the AUP:

- Students are not allowed to send, access, upload, download, or distribute offensive, profane, threatening, pornographic, obscene, or sexually explicit materials.
- Use of the camera and microphone in the school are strictly prohibited without permission from the teacher.
- Malicious use or vandalism—such as any attempt to destroy hardware, software, or data—is prohibited.
- Jail breaking—that is, removing limitations placed on a device by its manufacturer—is strictly prohibited.

Compensating for an App's Shortcomings

Often it's hard to find the perfect app for your needs. You might be looking for an app that targets a particular age, a particular subject, and even a specific standard. But you might not find all of that in a strong instructional app that has all of the features that I described earlier. And though initially this limitation might seem like a drawback, it is actually a learning opportunity that helps teachers enhance their app integration skills. Imagine this scenario: A teacher approaches a technology coordinator and asks her to purchase a particular app. Together, the teacher and tech coordinator check their preferred curation site for more information and a review of the app. Perhaps they discover that the app does not include any error remediation, the reading level is too high for the student who needs it, and the app doesn't include learner support. This doesn't necessarily mean that the app should be dismissed for possible use. But what it does mean is that now the teacher and the tech coordinator have the chance to discuss how the teacher might need to augment the student's use of the app. If the teacher says to the technology coordinator, "Well, those things don't matter to me that much because I plan to sit with the student and help him use the app. I'll provide the help that the app doesn't provide," then a less optimal app may work just fine. The key is to examine what a given app lacks and make a plan for best use of that app, taking those shortcomings into consideration.

Conclusion

reating a content strategy can be a daunting task for anyone implementing mobile devices in education. But having a strategy to prepare for, select, and use content with mobile devices is critical to the goals of all of the stakeholders in the education system implementing such devices. The principles and recommendations covered in this guide will help get you started.

References

148Apps. (2014, April 28). App Store Metrics [Blog post]. Retrieved from http://148apps.biz/app-store-metrics/

AppTornado GmbH. (2014, February 13). AppBrain [Website], Zurich, Switzerland. Retrieved May 3, 2014 from http://www.appbrain.com/stats/android-market-app-categories

Appitic. (2014). Appitic [Website]. Monterrey, Mexico. Retrieved May 3, 2014 from http://www.appitic.com

Azevedo, R., & Bernard, R. M. (1995). A meta-analysis of the effects of feedback in computer-based instruction. *Journal of Educational Computing Research*, *13*(2), 111–127.

Balefire Labs. (2013, August 26). Only two of top 10 edApps in iTunes are worth buying [Blog post]. Retrieved from http://www.balefirelabs.com/apps/?p=21670

Balefire Labs. (2013, October 29). Are you wasting money on educational apps? [Blog post]. Retrieved from http://www.balefirelabs.com/apps/?p=23862

Balefire Labs. (2014). Balefire Labs [Website]. Tyngsborough, MA. Retrieved May 3, 2014 from http://www.balefirelabs.com

Common Sense Media. (2013). Graphite [Website]. San Francisco, CA. Retrieved May 3, 2014 from http://www.graphite.org

Ericsson, K. A., & Lehmann, A. C. (1996). Expert and exceptional performance: Evidence of maximal adaptation to task constraints. *Annual Review of Psychology*, *47*, 273–305.

Gerhardt-Powals, J. (1996). Cognitive engineering principles for enhancing human-computer performance. *International Journal of Human-Computer Interaction*, *8*(2), 189–211.

GoSoftWorks. (2013). GoSkyWatch Planetarium (Version 7.0.0) [Mobile Application Software]. Retrieved from https://itunes.apple.com

Greenwood, C. R., Delquadri, J. C., & Hall, R. V. (1984). Opportunity to respond and student academic performance. In W. L. Heward, T. E. Heron, D. S. Hill, & J. Trap-Porter (Eds.), *Focus on behavior analysis in education* (pp. 58–88). Columbus, OH: Charles E. Merrill Publishing Company.

Hanna, L., Risden, K., Czerwinski, M., & Alexander, K. J. (1998). The role of usability research in designing children's computer products. In A. Druin (Ed.), *The design of children's technology* (pp. 4–26). San Francisco, CA: Morgan Kaufman.

HomerLearning, Inc. (2014) Learn With Homer. (Version 1.14) [Mobile Application Software]. Retrieved from https://itunes.apple.com

Innovative Mobile Apps. (2013). Story Creator (Version 4.0) [Mobile Application Software]. Retrieved from https://itunes.apple.com

Kulik, C. L. C., & Kulik, J. A. (1990). Effectiveness of mastery learning programs: A meta-analysis. *Review of Educational Research*, *60*(2), 265–299.

LaunchPad Toys. (2014). Toontastic. (Version 2.9.0) [Mobile Application Software]. Retrieved from https://itunes.apple.com

Mayer, R. E., Heiser, J., & Lonn, S. (2001). Cognitive constraints on multimedia learning: When presenting more material results in less understanding. *Journal of Educational Psychology*, *93*, 187–198.

MorrisCooke. (2014). Explain Everything (Version 2.42) [Mobile Application Software]. Retrieved from https://itunes.apple.com

PBS Kids. (2014). PBS KIDS Video (Version 2.0.7) [Mobile Application Software]. Retrieved from https://itunes.apple.com

PBS LearningMedia. (2013). PBS Survey finds teachers are embracing digital resources to propel student learning. Retrieved January 9, 2014, from http://www.pbs.org/about/news/archive/2013/teacher-tech-survey/

Sanoma Media Netherlands B.V. (2013). LetterSchool (Version 1.0.2) [Mobile Application Software]. Retrieved from https://itunes.apple.com

Software MacKiev. (2011). World Book: This Day in History [Mobile Application Software]. Retrieved from https://itunes.apple.com

Teachers With Apps. (2014). Teachers with Apps [Website]. Retrieved May 3, 2014 from http://teacherswithapps.com

The Verge. (2013, October 22). Apple announces 1 million apps in the App Store, more than 1 billion songs played on iTunes radio [Blog post]. Retrieved from http://www.theverge.com/2013/10/22/4866302/apple-announces-1-million-apps-in-the-app-store

Tsai, F., Kinzer, C., Hung, K., Chen, C., & Hsu, I. (2013). The importance and use of targeted content knowledge with scaffolding aid in educational simulation games. *Interactive Learning Environments*, *21*(2), 116–128.

Van Houten, R. (1984). Setting up performance feedback systems in the classroom. In W. L. Heward, T. E. Heron, D. S. Hill, & J. Trap-Porter (Eds.), *Focus on behavior analysis in education* (pp. 112–125). Columbus, OH: Charles E. Merrill Publishing Company.

Wayman, J. C. (2005). Involving teachers in data-driven decision-making: Using computer data systems to support teacher inquiry and reflection. J*ournal of Education for Students Placed at Risk*, *10*(3), 295–308.

West, D. (2013, January 17). Mobile learning: Transforming education, engaging students, and improving outcomes [Blog Post]. Retrieved from http://www.brookings.edu/research/papers/2013/09/17-mobile-learning-education-engaging-students-west

WeWantToKnow AS. (2014) DragonBox Algebra 5+ (version 1.2.0) [Mobile Application Software]. Retrieved from https://itunes.apple.com

Appendix 1: Screenshots—Sample App Evaluations

Balefire Labs (www.balefirelabs.com)

DragonBox Algebra 5+

Publisher: WeWantToKnow AS
Platform: iOS, Android
Version: 1.0.0
Price: $5.99
Age: 10 yrs, 11 yrs, 12 yrs, 13 yrs, 14 yrs, 15 yrs, 16 yrs, 17 yrs, 18 yrs

Balefire Labs Review

B-

This app requires learners to move mathematical objects on the screen to solve algebra problems.

Instructional Design

✔ Feedback for Correct Responses

✔ Error Feedback

✔ Adapting Difficulty

✘ Error Remediation

✔ Mastery-Based Instruction

✔ Frequent, Meaningful, Learner Interaction

✔ Clearly-Stated Learning Objectives

Usability Design

✔ Relevant Screen & Sound Use

✘ Learner Support Available

✔ Easy-to-Use Interface

✔ Age-Appropriate Reading Level

✘ Performance Reports with Actionable Data

Common Core State Standards Alignment:

Mathematics

▸ **4.OA.A.2** - Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

▸ **6.NS.C.6a** - Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite.

▸ **6.EE.A.2** - Write, read, and evaluate expressions in which letters stand for numbers.

(continued)

- **6.EE.B.5** - Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
- **7.NS.A.1a** - Describe situations in which opposite quantities combine to make 0.
- **7.EE.B.4** - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
- **8.EE.C.7** - Solve linear equations in one variable.

○ Less

Publisher Description

NOW EVERYONE CAN LEARN DIFFICULT MATH AND HAVE FUN

SOLVING ALGEBRA EQUATIONS AFTER JUST ONE HOUR OF PLAYING

(Note: DragonBox+ is not an upgrade or extension pack. It is the full DragonBox game plus 100 extra levels).

Many children today struggle with mathematics while other children want greater challenges. DragonBox is a revolutionary game that will make your child enjoy learning mathematics while progressing at his or her own pace.

Our intention has been to create a game that children experience as a real game that is actually fun, but where they after one hour of playing, they will be able to solve mathematic equations that they never thought they would be able to solve so quickly before.

The DragonBox game has been tested in schools in France and in Norway, and the results clearly demonstrate increased understanding of basic mathematics and the improved ability to solve equations. More importantly, it shows a significant positive change in childrens attitude towards learning mathematics.

DragonBox is taking Game Based Learning to a new level and will contribute to demystifying algebra in such a way that children at all levels will start to enjoy and embrace learning mathematics.

It is a great game for parents to play along with their kids and freshen up their own math skills.

DragonBox+ contains an additional 100 standard equations to help your child become a real master of algebra.

The game is in English, French, Norwegian, Spanish and Swedish.

Teachers with Apps (www.teacherswithapps.com)

DragonBox Algebra 5+ – the Revolutionary Algebra App

BY REBECCA SIMON · OCTOBER 18, 2012 · INTERMEDIATE MATH, MATH, TWA CERTIFIED, TWA PICKS · 5 COMMENTS

Dragon Box, by WeWantToKnow AS – I vividly remember the days long ago, when I was in middle school learning algebra. There was "y", there was "x", there was "x+y=5", there was "1/x + 2/y = ⅓", and so forth. Most middle school students would not find learning pre-algebra or algebra that exciting. On the contrary, they might find it quite boring. Sitting and learning a bunch of letter and number combinations, which have no meaning to the students whatsoever, is just not appealing or engaging. In addition, the equations and formulas being taught are abstract; they are not something concrete that the students can relate to. It is the teacher's job to teach the material in a way the students can relate to... to make it meaningful to them.

As we are moving further into the 21st century, students are expecting that their learning include digital devices. In addition, it is becoming increasingly common that the content being taught is presented in a way that includes online gaming, simulations, and/or augmented reality. What better way to teach abstract content, such as algebra, than to teach it with games?!? Teaching with games motivates and engages students.

Dragon Box is highly beneficial for students in middle school. Although, those who are younger and even adults who are "young at heart" will enjoy it as well. I gave my son, who is in seventh grade, a chance to field-test the Dragon Box and I played it as well. We both enjoyed it immensely! Even more so, it was quite addicting! Rather than giving a problem such as "x+y=5" to solve, the app game starts at a very basic level. For instance, instead of starting with solving equations and problems, the game first teaches the user how to discriminate between two characters and to separate them. It affords the opportunity to practice the same steps that are involved in Algebra. However, they are presented in such a exciting way, that the user would never know it. This includes such steps as applying the same strategy to both sides of the equation, looking for like terms, and changing whole numbers into fractions. It also gives step by step directions early on and directs the user as how to proceed. Instead of characters such as "x" and "y," the game uses avatars and other objects. This is so important and beneficial because these things are concrete and much easier for children to relate to, as opposed to just random characters that are more abstract. A child has a greater chance of retaining the skill or content being taught when it is presented in a meaningful way, that he or she can relate to, as opposed to something abstract which has no connection whatsoever.

As I said, after my son had the chance to play Dragon Box, I decided to play the game and found it to be very addicting! If algebra had been taught this way when I was in middle school, I would definitely have had so much more fun and success! I love how it uses little avatars, fish, animals and other objects to act as the symbols (representing the numbers and letters). The app's development was clearly well thought out, it's very thorough and impressive. There are a few steps or directions that are added in here and there, but not on each level. Eventually, I got stuck on a level…. Which brings me to this – I have one suggestion that would make this app even better. Currently, there is no support or directions within the app itself. When the user gets stuck on a level, there are no hints, suggestions, or help as to what would be the next step. It basically just starts over and over again, keeping record of what steps worked and didn't work. A walk through or user guide within the app would be very beneficial. Overall, Dragon Box is a great app. My son really enjoyed playing it and so did I, for that matter!

Graphite (www.graphite.org)

DragonBox Algebra 5+

Mesmerizing step-by-step puzzler sets the foundation for algebra

LEARNING RATING ●●●●● BEST

TEACHER RATING ●●●●● BEST
(10 Teacher Reviews)

Price: Paid, $5.99

Grades: 4-8

Platforms: Android, iPad, iPhone, iPod Touch, Kindle Fire, Windows Phone, Apps for Windows

Kids learn to solve for X by isolating the "Box" seen here.

TEACHERS USING DRAGONBOX ALGEBRA 5+

I use it!

"Great at teaching the rules of Algebra-"
- Heather H.

"Algebra concepts taught initially without the distraction of numbers. "
- Jason J.

"Fantastic Way to Intro Algebra"
- Gustavo P.

"Intuitive app supports algebraic thinking"
- Elisa E.

Read 10 Teacher Reviews

QUICK TAKE

Pros:
A truly elegant design integrates entertainment and instruction so seamlessly that playing = learning.

Cons:
Some levels may be hard to solve without hints.

Bottom Line:
This innovative game-changer teaches algebra, changes the way kids learn it, and even changes how they feel about it.

Read how we rate and review all products on Graphite

LEARNING SCORES

Engagement ⑦ ●●●●●
It's as fun to play as any best-selling game. Kids will definitely enjoy the challenge -- especially as equations become harder and harder to balance.

Pedagogy ⑦ ●●●●●
Kids solve equations as they play, which makes for a wonderfully integrated experience between navigating the game and building critical thinking. Moving to paper may be difficult, but the developer's blog gives tips.

Support ⑦ ●●●●○
Tutorials are great for teaching rules; kids may get frustrated without any hints or help. Still, the website suggests adults intervene as little as possible, saying, "Mathematics is a game. Don't spoil it!"

OUR REVIEW

What's It Like?
DragonBox Algebra 5+ teaches kids algebra in a refreshing and unique way. Ten chapters get increasingly complex, and drag-and-drop simplicity teaches kids to solve, balance, and reduce multi-variable equations and overcome fears about learning math. Kids get introduced to an algebraic concept with cute cartoons of baby dragons and nonintimidating language. For instance, the fact that integers in equations can be canceled out by their negative counterparts is called a "night card" or opposite. Players must then balance equations, and they can't make a move until they put the identical card on the other side. As the level progresses, pictures are gradually replaced with numbers and variables, but the actions (like canceling out and reducing fractions and isolating X) become rote and mesmerizing.

See Common Core Standards

SUBJECTS

Math
algebra
equations

Once the game is installed, students can customize and play with up to four avatars on the same device. Unfortunately, once levels are unlocked, they stay that way, so only the first students to play will get that pleasure.

Is It Good For Learning?
Unlike many math games, *DragonBox Algebra 5+* integrates entertainment and instruction so seamlessly that learning gameplay is essentially learning algebra. By the time kids "win" the game, they'll be shocked by how much they've learned. It's compelling because it replaces math language with the language of a game like *Angry Birds*. Kids will likely feel encouraged as they play because of the rewards system. Each level awards up to three stars: one for isolating the box (solving for X), one for completing the level in the right number of moves, and one for having the right number of cards. Kids have to solve levels correctly before they can move on to the next one. They get no hints, though, so they need to figure things out themselves.

Students will like the personalized avatars and the accessible intro tutorial that takes them through game basics step by step. Many kids will appreciate learning math without stale language, and teachers will definitely like how this innovative app can change the way students feel about algebra.

How Can Teachers Use It?
You may consider using *DragonBox Algebra 5+* in the classroom as a way to solidify concepts. Bear in mind that the full app buys the lesson levels, 100 bonus problems, and avatars for up to four players. Kids could theoretically share avatars, but part of the fun is unlocking levels. Another nice feature is the Transfer Document, which helps teachers migrate the experience from the mobile device to paper. The website recommends teachers be mindful that the automatic features (for example, forcing players to add, subtract, multiply, and divide on both sides and updating equations on one line) will need to be adapted for paper-and-pencil problem-solving.

This review of *DragonBox Algebra 5+* was written by Amanda Finkelberg

Field Notes

Showing 6 of 9 Teacher Reviews

Have you used DragonBox Algebra 5+ in your teaching? **Add a Field Note**

Heather H. Assets School Honolulu, HI	**Great at teaching the rules of Algebra-** *Submitted March 4, 2014*	TEACHER RATING ●●●
Jason J. 24 FOLLOWERS	**Algebra concepts taught initially without the distraction of numbers.** *Submitted March 4, 2014*	TEACHER RATING ●●●●●
Gustavo P. Waters Elementary School Chicago, IL	**Fantastic Way to Intro Algebra** *Submitted June 21, 2013*	TEACHER RATING ●●●●●
Elisa E. Berkwood Hedge School Berkeley, CA	**Intuitive app supports algebraic thinking** *Submitted August 10, 2013*	TEACHER RATING ●●●●●
Krista M. 1 FOLLOWER	**Great Game Builds Algebraic Thinking!** *Submitted August 15, 2013*	TEACHER RATING ●●●●●
EricPS East Bronx Academy for the Future Bronx, NY	**Playing algebra without saying it.** *Submitted September 1, 2013*	TEACHER RATING ●●●●●

Show All Field Notes For DragonBox Algebra 5+

SKILLS

Thinking & Reasoning
logic
solving puzzles
strategy

GENERAL INFORMATION

Great For
Individual
Knowledge gain
Small group
Student-driven work

Great With
Advanced learners
General

Setup Time
Less than 5 minutes

Tech Notes
Minimum requirements: iOS 4.0 or later; Android 2.2 and up

Teacher Dashboard
None

Publisher
WeWantToKnow AS

Latest poll

What would you call our tech-rich lesson plans (App Flows) if you could change the name?

- ○ App Flow
- ○ Tech Flow
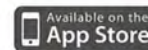- ○ Lesson Flow
- ○ Flow
- ○ Activity Flow

Vote

Older polls
Results

Appitic (www.appitic.com)

DragonBox Algebra 5+

Price

$5.99 USD

Supported Devices

Description

DragonBox+ Algebra – The whole algebra in a single game

USA today: "brilliant, kids don't even know that they are doing math"

Wired: "DragonBox is making me reconsider all the times I've called an educational app "innovative.""

Forbes: "Step aside sudoku, algebra is the primordial puzzle game."
"My son jumped right into the game. About an hour and a half later he was solving junior high level algebraic equations. Amazing."

DragonBox introduces the main math elements in a playful and colorful world that appeals to children. The game features a gradual learning of fundamental algebraic elements (equal sign, zero, multiplication, division, parenthesis, negative numbers, fractions, ...).

The player learns at his/her own pace, experimenting with rules that are introduced step by step. Progress is illustrated with the birth and growth of a dragon for each new chapter.

This game primarily targets children from 6 to 16 who are willing to discover algebra or to consolidate past learning and gains. Playing doesn't require supervision, although parents can help making the learning more efficient and transferring learned skills in real life. It is a great game for parents to play along with their kids – and freshen up their own math skills.

DragonBox is based on an original concept developed in Norway, introducing a novel pedagogical method based on discovery and experimentation. The game greatly helps children to make it up with math, and contributes to sharpen their desire to learn and to be successful with math.

This game is the subject of extensive research at the Center for Game Science of the University of Washington.

DragonBox has received many distinctions, and among others, the Gold Medal of the 2012 Serious Play Award (USA) and the Best Serious Game at the 2013 IMGA Awards. It is recommended by Common Sense Media.

Features

* 10 progressive chapters (5 learning, 5 training)
* 200 puzzles
* Suggested (and not put forward) rules the child can experiment with
* Multiple profiles for easy progress control
* Dedicated graphics and music for each chapter
* 16 supported languages (English, français, norsk, svenska, dansk, español, ???, italiano, português, Deutsch, ???????, ????, ????, suomi, nederlands, euskara)

Testimonials

"Brilliant – My 7-year-old son has now grasped pre Algebra because of this app."

"Unbelievably engaging for kids... – I was hoping for the best with this app and wasn't disappointed. Totally teaches algebra without them even realizing it. Awesome!"

"My 12 year old can do algebra because of this program, and her 8 year old sister wants to try it."

"This is definitely the most intuitive math learning program since Algebra Touch"

"I'm not dumb. Fluent in 7 languages. No problems with Chemistry, physics or even Trigonometry. Just. Not. Algebra. No teacher or friend ever managed to get through to me. Even though I fully understood that it is more about following the rules than understanding.. Very, very frustrating. Gave this a try for a dare. Spent one hour playing and halfway through the bonus levels I was already solving them in my head.. I'm shocked and amazed. Don't know wether to laugh or cry hysterically. Thank you. A HUGE weight has just dropped of my shoulders. I feel a foot taller. Thank you SO much! I still can't believe it..."

"Through this simple game, I have started to see math in a new light. Thank you for writing this excellent app!!!"

Support

To all users, please contact us for report issues & improvements. It's unfortunately not possible to answer your individual posts on the market. Thanks for your understanding !

SCREENSHOTS

Appendix 2: Technical Checklist Sample

1. Technical		
	A. My platform(s) is/are:	iOS
	B. My device(s) is/are:	iPad
	C. My operating systems is/are:	iOS 7
2. Pedagogical		
	What is the learning objective?	Complete algebra problems with one unknown variable
	To achieve that objective I believe I need a: (underline one)	<u>Instructional app</u> Creativity/Productivity app Tool app Book app
3. Selection		
	Instructional app	Dragonbox Algebra 5+
	Feedback:	Yes
	Adapting Difficulty:	Yes
	Mastery-Based:	Yes
	High Response Rates:	Yes
	Clear Learning Objectives:	Yes
	Performance Reports:	No
	Usability:	Yes
	Creativity app	
	Easy-to-use:	
	Effective mobile layout:	
	Exportable product:	
	Files can be imported:	
	Clear entry requirements:	
	Tool app	
	Information is accurate:	
	Tool is intuitive/easy-to-use:	
	Book app	
	Reading level is age-appropriate:	
	Content is age-appropriate:	
4. Special Considerations		
	Aligned to standards?	Yes
	Accessible?	No
	In-app purchases?	No
	Social media link?	No
	Push notifications?	No
	Advertisements?	No

Appendix 3: Technical Checklist

1. Technical		
	A. My platform(s) is/are:	
	B. My device(s) is/are:	
	C. My operating systems is/are:	
2. Pedagogical		
	What is the learning objective?	
	To achieve that objective I believe I need a: (underline one)	Instructional app Creativity/Productivity app Tool app Book app
3. Selection		
	Instructional app	
	Feedback:	
	Adapting Difficulty:	
	Mastery-Based:	
	High Response Rates:	
	Clear Learning Objectives:	
	Performance Reports:	
	Usability:	
	Creativity app	
	Easy-to-use:	
	Effective mobile layout:	
	Exportable product:	
	Files can be imported:	
	Clear entry requirements:	
	Tool app	
	Information is accurate:	
	Tool is intuitive/easy-to-use:	
	Book app	
	Reading level is age-appropriate:	
	Content is age-appropriate:	
4. Special Considerations		
	Aligned to standards?	
	Accessible?	
	In-app purchases?	
	Social media link?	
	Push notifications?	
	Advertisements?	

About the Author

Karen L. Mahon, Ed.D., is the president and founder of Balefire Labs, an online educational app review service that focuses on evaluating the instructional quality and usability of mobile apps for grades preK–12. She is an educational psychologist and instructional designer with more than 15 years' experience in education technology. Prior to founding Balefire Labs, Karen was global senior manager of learning sciences at Mimio Interactive Teaching Technologies, where she established Mimio's global content strategy and instructional philosophy. Other previous appointments have included principal investigator and research scientist at Praxis, Inc., a Waltham, Massachusetts, education technology startup that produced instructional software for children with severe and profound intellectual disabilities; research assistant professor at the University of Kansas, Parsons Research Center; and positive behavior support specialist at the Autism Training Center at Marshall University. In all of these roles, Karen has consulted with numerous schools and conducted countless teacher trainings. Karen received her Ed.D. and M.A. in educational psychology from West Virginia University; her Product Management Certificate from the University of California, Berkeley, Haas School of Business; and her B.A. in psychology from the University of California, San Diego.

For more information about the

Center on Innovations in Learning
please visit

www.centeril.org