point|counterpoint

Are Drill-and-Practice Apps an Appropriate Educational Use of Technology?

YES

Caitlin McLemore

Drill-and-practice mobile apps are good for reinforcement of previously learned skills, memorization of new facts, and additional practice in a challenging subject.

Before students advance to higher-order thinking skills, they must be able to remember and understand a concept. Yes, teachers want to promote critical thinking and problem solving in the classroom, but there is a time and place for all levels of learning. Sometimes we need to be able to do simple tasks like make change, remember the name of the president, or know how to ask for the restroom in Spanish. We can strengthen these recall-type tasks by using drill-and-practice mobile apps to increase students' knowledge base.

Of course, that doesn't mean that every drill-and-practice app is a good one. Here are some guidelines educators can follow to ensure they use apps appropriately in the classroom:

Quality. Make sure you evaluate any mobile app you use in the classroom for quality and educational content. Even with drill-and-practice apps, the content should be accurate and developmentally appropriate. Using NETS and curriculum standards will help guide evaluation. Also make sure the activities work, are well made, and hold students' interest.

Price. Some developers and publishers have app sales that typically last for a short period of time but can help save money for the school. Many paid apps also offer alternative "lite" or free versions that offer limited content or features. This option is good for saving money and for evaluating or piloting an app before purchasing it for an entire class or school. And many companies offer high-quality free apps with educational content.

Situation. Drill-and-practice apps can be beneficial in the right situations, such as when a student:

• Needs to review previously learned material

• Prefers to learn material via drill-and-practice apps. Every student has a different learning style and preference for learning.

• Has a few minutes of free time when the teacher is working with others.

I am all in favor of technology that encourages creativity, critical thinking, and problem solving. But sometimes students need a little scaffolding to help them on their way to these higher-order skills, and drill-and-practice apps are an engaging way to do this.

—Caitlin McLemore is a PK–12 media technology integrationist at Currey Ingram Academy in Brentwood, Tennessee, USA. Caitlin has a M.Ed. in elementary education with a specialization in educational technology from the University of Florida.

NO

Kendra Grant

Avoid drill and practice apps at all cost! At best, they help some students learn some basic skills. At worst, they waste valuable learning time and money.

We know that teaching and learning need to change if students are going to meet the challenges of the new century. Neither traditional flashcards nor flashy apps will address this need. Instead, we can embed much of this isolated drill-and-practice activity into rich learning that builds the skills students need for college, career, and life. Students busily tapping on a flashcard app or writing their times tables with their finger may give the illusion of 21st century learning while barely scratching the surface, and all this busyness just replaces previous busy work using paper and pencil.

Technology should be a catalyst for change, or at the very least, a lens to reexamine teaching and learning. Unfortunately, technology is often used to replicate existing practices. We did this with computers and interactive whiteboards. Putting an iPad in students' hands will not change this replication of practice, and neither will filling up the device's memory with drill apps.

When building curricula, units, and lessons, we need to plan with intent by asking these questions:

• Am I using mobile devices to replicate, amplify, or transform current instructional practices?
• Why do I want a drill app? Do students need this skill? Is there another way to help students build, understand, and use this particular skill beyond using a drill app?
• What tool app or apps could I purchase to support multiple learners, multiple curriculum areas, and multiple tasks?

Downloading a set of drill apps might seem like a quick and easy way to get started using mobile devices. Don't do it. They are a distraction from the hard work needed to create deep learning that addresses the 4 C's: critical thinking and problem solving, communication, collaboration, and creativity. If we wish to bridge the more than 30-year gap between teachers' expertise in both curriculum and pedagogy and the understanding of how technology connects, expands, and changes teaching and learning, then we must resist replication of practice, challenge our thinking, and spend our limited resources on apps that help good teachers create deep learning.

—Kendra Grant is a 30-year veteran K–12 educator with more than 13 years experience supporting large-scale technology implementation through the design and delivery of blended professional learning. She is currently chief education officer at Sublime Learning.

Free Up Thinking Power
Because the amount of information a student can attend to at any one time is limited, being able to easily retrieve certain elements of a task allows students to focus more attention on other components. If learners have to struggle when retrieving information, they are unable to focus conscious attention on using their knowledge and skills for solving new problems in innovative ways.
    Marilyn Ault
    Director, Advanced Learning Technologies in Education Consortia
    Lawrence, Kansas, USA

Spend Your Resources Wisely
Are worksheets an appropriate educational use of the paper fund in a school? Would you like to see a teacher printing copies of a worksheet? Or would you rather see that same amount of paper used to print an informational flyer about a local issue that students produced to distribute around the community? If the majority of technology or paper-based activities is spent on drill and practice, then these resources are employed rather ineffectively.
    Nikkol Bauer
    CIO, Henry County Public Schools
    Louisville, Kentucky, USA

Easy to Manage
Apps for vocabulary or multiplication tables usually give immediate feedback. They provide a time limit. They can be tracked. They are usually entertaining and provide another mode of instruction for skill development. All these attributes are hallmarks of successful lessons and classroom management.
    Joan P. Hinshaw
    Learning Specialist
    São Paulo, Brazil

Don't Rob Them of Their Chance to Think
The value of new technology is in opening up new pathways to learning that are better, faster, and cheaper than the old ways. You can learn something such as $7 \times 8 = 56$ from flash cards or by recognizing patterns. Using flash card software for things that can be learned by discerning patterns robs children of the opportunity to think.
    Harry Keller
    President, Smart Science Education, Inc.
    Los Angeles, California, USA

Can't Learn Without It
Though drill and practice is denigrated by modern educational populists, there is a very strong, growing, and evidence-based backlash against too much learning without drill and practice. For example, students need to understand *why* 5 x 6 is 30, but they also need to be able to recognise instantly that 5 x 6 is 30. That's where drill and practice (times tables) comes in.
    Eric Dunbar
    Teacher
    Toronto, Ontario, Canada

Let Students Choose
A self-directed approach—meaning students can use the method that works best for them—wins out. Students should be allowed to choose from a specific "folder" of apps relating to the curriculum that they are working on that has a mix of instructive (drill-and-practice) or constructive (open-ended, with a focus more on creating) apps.
    John McCann
    Project Manager
    Newcastle, New South Wales, Australia

A Place in Bloom's and the NETS
Although drill-and-practice is not the most compelling instructional approach, it does have its place in education. Even Bloom's Taxonomy has a basis [for this]. I also believe flash card apps address the Research and Information Fluency standard of the NETS for Students.
    Thomas Petra
    Technology Integration Specialist
    Hagatna, Guam, USA

Drill Your Way to Critical Thinking
As a classroom English teacher, I came across many students who could not think critically even though they had been given many critical thinking exercises. There were simply able to regurgitate someone else's analysis or solution. They did not have the basic skills they needed to critically analyze literature because no one bothered to spend much time on the foundation of analysis, which would have required some skill-and-drill practice.
    Jesse Ault
    Instructional Technology Liaison
    Washington, D.C., USA