

TEACHING WITH TABLETS

*How do I integrate tablets with
effective instruction?*

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A Transformation in Education

Mrs. Burow begins her math class by announcing, “Today, we’re going to be looking at the interactive game Angry Birds.” The students, settling in, pause and look up. “No, not just the game,” Mrs. Burow says, “but the beautiful parabolas that we can create with the game. If you recall from last week’s lesson, we started learning about parabolas and their importance in various settings.”

With her tablet screen now projected for all to see, Mrs. Burow launches the digital game and starts at the first level. As she flicks and swipes and taps away, she points out how the arches vary depending on the launch point of the bird. When a student calls out that if she taps on a bird it will explode and break more blocks, Mrs. Burow quickly responds, “Oh, I don’t really know how to play the game, but what I *do* know is how parabolas work.”

In these first minutes of class, Mrs. Burow uses her modeling skills and an app on her iPad to help her students find a real-world application of parabolas. She maintains her instructional purpose by foregrounding the mathematical thinking. Employing the iPad and Angry Birds was a conscious decision and an organic component of Mrs. Burow’s lesson, just as any other portion of her lesson plan might have been that day.

The learning scene isn't too different in the classroom next door. Heather Anderson begins her 10th grade English class by reviewing the week's vocabulary terms. Her presentation method? A combination of her iPad, the note-taking app Notability, the cloud storage service Dropbox, and a previous class session, archived on her classroom page of the school's Haiku learning management system (LMS).

In fact, it's very much the same in every classroom in this school: teachers in English, social studies, math, science, and the arts combine best teaching practices and new teaching tools. They are revitalizing favorite lessons, creating innovative new ones, and reaching a student audience eager to interact with content in personal ways. One of their most powerful and versatile tools? The tablet computer.

In 2010, when Apple's iPad tablet was first released, the education community immediately asked questions about its application:

- Does it belong in the classroom?
- Will it change education?
- Are we ready to use it?

The iPad's appeal was obvious: a practical design (small and light, mobile, touchscreen activated); flexible, intuitive interactive features; and wireless Internet connectivity for online learning. Educators noted how the touchscreen eliminates the cognitive barrier a keyboard can present. You don't need to know how to type in order to use a tablet—you don't even need to know the alphabet, which is a real plus

for emergent readers. Speculation ran high that putting this device into classrooms would be a shortcut to student engagement: a way to grab hold of their interest and encourage them to interact with content on a more personalized level. What's more, the tablet could be readily customized to differentiate content, process, and product—and thus support classroom differentiation (Tomlinson & Imbeau, 2010).

In the few short years since the iPad's introduction, a slew of tablet devices has been released. Their popularity translates into a growing community of people who are comfortable using the devices and their wide range of features. According to a Pew Internet & American Life Project survey, 39 percent of the Advanced Placement and National Writing Project teachers in the study owned tablets, compared to 24 percent of all U.S. adults (Pew Research Center, 2013). Among the same group of teachers, 43 percent said that their students used tablets in the classroom. Although these surveyed teachers worked at the secondary level, it isn't unusual to see students in the primary grades using tablets daily.

Apple, the leading tablet producer, reported sales of 4.5 million iPads for educational use through the end of 2012 (Paczkowski, 2013). To be sure, access to tablets varies widely among districts. In a growing number of schools, the focus has been on acquiring a tablet for each student to use, whereas in other places, the effort has been more modest—a set of tablets that circulate from classroom to classroom or just a single tablet used primarily by the teacher.

But once we have tablets in the classroom—one, a few, or a whole set—what do we *do* with them? As with all classroom

tools, a tablet must be considered in terms of its end user (teacher, individual student, or a small group of students) and the learning purpose it will serve (Frey, Fisher, & Gonzalez, 2010). Who will use tablets, and will they use them to

- *Find information*—efficiently seek out information and determine if it is useful, credible, accurate, and corroborated by other sources?
- *Use information*—incorporate new information accurately and ethically while avoiding plagiarism?
- *Create information*—generate innovative visual displays and use interactive tools to deepen understanding?
- *Share information*—responsibly transmit information to different audiences and for a variety of purposes?

Note that the skills associated with each of these functions are at the heart of Literacy 2.0. Teachers who know how to use tablets effectively in the classroom can help their students build these essential skills while promoting mastery of content across the curriculum.

A Way of Staying Connected to Students in Real Time

Tablet use in the classroom can also enhance teacher-student contact. Because we no longer need to remain tethered to a workstation at the front of the classroom, we can, for example, record attendance data as we greet students at the classroom door. We can use physical proximity to quietly redirect students who need it, keeping the class focused

and on track. And we can deliver prepared presentations via wireless projection—moving purposefully around the classroom, checking in with individual students, seeing their work in real time, and capturing formative assessment performance data right there in the tablet.

Managing content remotely is nothing new. Educators have long had clickers and other remote control devices that have helped us go back and forth on slideshow presentations. But with tablets, the content of these presentations can be more vibrant and engaging. As students pose questions, a teacher can easily access a page of a digital textbook, a website, or a video segment to address their queries and simultaneously illustrate the role that information gathering plays in inquiry.

With a tablet in hand, teachers can deliver instruction from any point in the room—even while sitting with an individual student or small group. Most of all, the tablet's connectivity gives teachers an unprecedented ability to show students how learning occurs in real time. No longer do we need to say “That’s a good question!” and then hope to address it in a later lesson. With a few taps on a screen, we—or the students themselves—can find information, assimilate it, and use it to further understanding.

In our roles as teacher leaders (Nancy and Doug) and a technology coordinator (Alex), we have encountered tablet teaching in various forms and levels of implementation. Most often, we’ve seen teachers use tablets to gather, organize, and disseminate content, and we’ve heard them praise tablets for many of the reasons we’ve just touched on: the

relatively small price tag when compared to a laptop, mobility, practical design, interactive features, and the large catalog of available apps. As a teaching and learning tool, what tablets promise is truly transformational change.

A Cautionary Note

There are indeed a lot of reasons to be excited about what tablets offer in the way of classroom enhancement, but there are concerns as well. Too many educators, perhaps excited by all that tablets can do, have found themselves surrendering their own knowledge of sound teaching and learning practices to the tablet.

We heard it ourselves at a professional development session at our school. A highly skilled and reflective teacher—one who develops amazing curriculum and uses small groups effectively—expressed concern about her own practice. “I love having the tablets available for my students, and they love them, too. But I realize I have a lot less collaborative learning going on this year. It struck me when I was watching the kids work yesterday. If these were worksheets in their hands instead of tablets, I’d be appalled.”

Battery-operated worksheets? Too little student interaction? Too much independent work? That is exactly what can happen if educators are not mindful of the *teaching* part of teaching with tablets. And that’s where this publication comes in. Here, we will look at how to use tablets in thoughtful ways that facilitate students’ understanding and how to integrate tablet use into high-quality instruction—whether that instruction is blended, online, or flipped. Tablets are a

tool that can improve the teaching and learning process. This excellent resource should never be relegated to the equivalent of a battery-operated, web-enabled “shut-up sheet.”



A High-Quality Teaching Framework

Much of our research has focused on the gradual release of responsibility instructional framework (Fisher & Frey, 2008). It’s an approach built on the seminal work of Pearson and Gallagher (1983), who described a model for aligning instruction to foster reading comprehension (i.e., shared reading, then guided reading, and then independent reading). Our work has expanded this model to describe a four-phase teaching and learning framework that is useful in all content areas and across the grade levels. Critically, we include collaborative learning as an essential linchpin in our framework. We further advocate for the gradual release of responsibility instructional framework as a common vocabulary all educators can use to discuss effective teaching, regardless of discipline or grade level (Fisher, Frey, & Nelson, 2012):

- *Focused instruction*—The teacher presents the lesson purpose, alerting students to the learning target and providing them with goals to measure their progress. Once purpose is established, the teacher presents

the lesson's content, using modeling to demonstrate processes or skills. This modeling is accompanied by thinking aloud, which gives learners insight into how an expert understands the content or the process.

- *Guided instruction*—Students begin to apply the skills, strategies, or processes that were introduced, with the teacher monitoring progress and collecting formative assessment data. For learners, making errors is critical at this phase of instruction; when students get stuck, the teacher's role is to ask questions and provide prompts and cues to redirect students toward understanding.
- *Collaborative learning*—Students consolidate their thinking and work together to apply new skills and knowledge to a novel situation. Learners engage in face-to-face and digital conversations on substantive topics, and this deepens their understanding of the skill, strategy, or topic.
- *Independent learning*—Students apply what they have been taught, fully expressing the skills and processes they have been using throughout the entire gradual release of responsibility framework, along with critical habits of mind, like metacognition and self-regulation.

A tablet offers new opportunities for students to interact with a teacher, one another, and the content. Without purposeful planning, however, tablet work falls into “just another activity.” In other words, the students are engaged, but learning is left to chance. Let's take a look at each phase

of instruction in more detail, highlighting how tablets can enhance these interactions and illustrating how teachers are using tablets to do just that.

Focused Instruction: Communicating Ideas and Concepts

Focused instruction prepares students for learning by *focusing* them on the content, strategies, or skills being taught. For the teacher, this phase involves three important instructional moves, each of which can be coordinated with tablet use.

Establishing purpose. Whenever new content is introduced, a teacher should provide students with a statement of purpose that identifies the targets for the lesson. There is a strong body of evidence supporting the use of purpose statements to increase learning (Hattie, 2008). Effective purpose statements focus on what students will be learning *today* and therefore should not simply be a restatement of the standards, which take many weeks and months to master. A strong purpose statement is further segmented to describe the content, language, and—in some cases—social outcomes for the lesson (Fisher & Frey, 2011):

Today's purpose is to understand the visual symbolism used by the filmmaker in a scene from *Citizen Kane*. You will discuss the use of symbolism with your classmates, using notes you have developed as you watch the film clip, and then arrive at a consensus as you identify five examples of visual symbolism in the clip.

The content purpose (visual symbolism in film) and language goals (analysis, note taking) are addressed, as is the social goal (arriving at a consensus). While we post our purpose statement on the board, we also communicate it verbally—partly to underscore its importance but also because so much information can be conveyed through tone, gesture, and intonation. We find that when talking about purpose, we naturally emphasize and repeat details that might not be included in a written statement.

Purpose statements are especially critical when students are working digitally—either alone or in collaboration with others. Students learning in an online environment don't have the same access to the nonverbal communication of the teacher. One method for overcoming this is to record a screencast of yourself delivering the purpose statement and elaborating on its details.

This is something biology teacher Kim Elliot and physics teacher Laura Ackerman do regularly for complex, digitally enhanced projects. With students using tablets to gather data, create video recordings of results, and document conclusions, it can be easy for them to become consumed by the logistics of these tasks and lose sight of the intended learning target. Both teachers create prerecorded screencasts of their projects' purpose statements, being sure to highlight the content, language, and social outcomes. These screencasts are posted on the school's LMS, where project teams can access them as needed. Teams are further directed to revisit the purposes to evaluate whether they have met their learning and collaboration goals. These purpose statements thus

function as a mechanism for driving the entire project rather than merely as words on a screen or a moment in time that soon vanishes from the team's collective memory.

If your school has an online learning management system, it's important to provide the purpose for each task you set for students. In Brenda Thompson's 6th grade class, students log on to the classroom page of the school's LMS and select the content they want to work on (e.g., science, social studies, English language arts, math). Although the learning management system provides students with an easy organizational system for their tasks, it can unintentionally focus them on their "to do" list rather than on the learning goals.

Ms. Thompson always includes a purpose for each of the tasks. For example, one of the tasks she assigned focused on the role of women in ancient Egypt. Ms. Thompson assembled a number of links to online resources. Students saw in the task description that they were to gather information to help them determine the differences between the status of women in ancient Egypt and a previously studied civilization of their choice (e.g., Greek, Roman, African, Asian). Alongside the task description was this purpose statement: *To describe the role of women in two different ancient civilizations, comparing and contrasting the differences in writing.* To ensure that students read and considered the purpose statement, Ms. Thompson required them to restate it in their own words and describe why the content they found might be useful. Students used their tablets' built-in microphone to make the recording and then loaded their responses on the LMS site.

Modeling and thinking aloud. Learners benefit greatly from an inside look at how an expert—a skilled reader, writer, or thinker—processes information and performs tasks. Typically, teachers provide this “inside look” by modeling and thinking aloud (Davey, 1987). An effective think-aloud features the following elements:

- *Naming the skill, strategy, or task.* “Today, I’m going to show you how I combine sentences to make more interesting and complex statements.”
- *Stating the purpose for using the skill, strategy, or task.* “It’s important as a writer to be able to construct sentences that aren’t repetitive or choppy. Sentence combining is one way to make sure sentences read smoothly.”
- *Explaining how the skill, strategy, or task is used.* “After I have written a passage, I reread it to see if I have choppy sentences or if I am repeating information unnecessarily. When I notice that’s occurred, I look for ways to combine sentences.”
- *Using analogies to link prior knowledge to new learning.* “I like to think of this as making sure I make a straight path for the reader to follow. When I eliminate choppy or redundant sentences, it’s like making a straight path of ideas to follow.”
- *Demonstrating how the skill, strategy, or task is completed.* “I’m going to show you three short, choppy sentences. Let’s look first at information I can cross out because it’s repetitive. Then I’m going to combine

those three sentences into one longer and more interesting sentence.”

- *Alerting learners about errors to avoid.* “I have to be careful not to cut out too much information or I’ll lose the meaning. I also need to watch out for sentences that are too long. A reader can lose the meaning of a sentence if it’s too long.”
- *Assessing the use of the skill.* “Now I’m going to reread my new sentence to see if it makes sense.” (Fisher & Frey, 2008, pp. 23–24)

Tablets broaden a teacher’s ability to model complex tasks and think aloud about his or her efforts. For example, reading specialist Amy Miles models fluent reading by recording herself on her tablet. She then plays back the recording for a target student, Ben, and pauses to think aloud about her use of rate and prosody. Ms. Miles uses her tablet to annotate a digital copy of the passage, marking phrase boundaries to improve her performance. She then invites the student she is working with to do the same. Ben records his own oral reading sample on her tablet and then plays it back. Ms. Miles prompts him to think aloud as he listens and to mark his own digital version of the reading. Following the notes he has made, Ben reads the passage again, and they repeat the process of listening, thinking aloud, and annotating. Ben can see and hear the progress he is making. Throughout the process, Ms. Miles uses her tablet to record formative assessment data, documenting her student’s responsiveness to intervention.

Although modeling and thinking aloud are located within the first phase of our instructional framework (focused instruction), there's no reason to confine them to the opening minutes of a lesson. These techniques are appropriate whenever you need to provide students with examples of expert thinking and task execution.

Consider this example from a small-group collaborative learning session in Philip Emerson's mathematics class. When Mr. Emerson notices several groups of students struggling to apply a set of formulas, he calls for their attention and says, "Let's take a look at this together." Quickly, he launches his note-taking app, Notability, and projects it onto the board. He revisits the notes students developed earlier in the lesson, providing think-aloud commentary to further illuminate how he can use the notes as a resource to solve a problem. In doing so, Mr. Emerson shows students how mathematical thinking—not memorizing algorithms—is critical to their work. This impromptu think-aloud is recorded on Mr. Emerson's note-taking app, and he later posts the audio on the LMS for students to review outside the classroom. In this way, tablet teaching not only facilitates activities in the classroom but also helps document them and preserve them as a resource.

Quick Tips for Using Tablets During Focused Instruction

When communicating ideas and concepts, establishing purpose, and modeling expert thinking, you need students following along closely. There are various ways to project

what's on your tablet (e.g., multimedia presentations, interactive examples, online illustrations) to a big screen. The wired method tethers the tablet user to a projector via a cable and video adapter. The wireless method can include an Apple TV hooked up to a projector or an app such as Reflector. Once installed on a laptop, Reflector (or a similar app) can mirror your tablet's display. Connect that laptop to an LCD or interactive whiteboard projector, and students will be able to see and follow along with anything you access through the tablet.

Guided Instruction: Monitoring Student Application and Providing Scaffolds

Modeling and thinking aloud provide students with early exposure to a new skill or strategy, but in order to advance their understanding, they need opportunities for application. We've all had students nod in the affirmative when we ask, "Does this make sense?"—only to see them struggle when they attempt to perform that task or use new information. This struggle is not a failure on the part of the teacher or the students, though; it is a necessary part of learning. We often tell our own students that our main job—as teachers—is to provoke errors, because the errors they make are key to learning.

During guided instruction, the teacher follows students' first efforts at application, notices what they are doing, and provides feedback in the form of questions, prompts, and cues (Fisher & Frey, 2010). Sometimes, these scaffolds are designed to lead students to consider information they

already know but have just forgotten to apply. Frequently, they are the tools a teacher uses to shift novice learners' attention toward salient information and away from extraneous elements. When a new understanding breaks down, questions, prompts, and cues are what nudge students back onto the learning path.

In the guided instruction phase of learning, tablets can be deployed to help gauge how students are applying concepts so that you can furnish additional scaffolds as needed. They give you various ways to communicate with students, through built-in social sharing and messaging features and apps that are programmed to provide interactive feedback. Consider apps such as Nearpod and ShowMe. Both provide many opportunities to engage students and gain insight into their understanding of new content in synchronous (real time) and asynchronous (delayed) modes.

Synchronous guided instruction. The Nearpod service and app offers the choice of several real-time interactive features that support learning. You can use Nearpod's free and paid subscription accounts to create activities and presentation slideshows with pictures, videos, polls, Q&As, and quizzes. Students access these activities and presentations via their tablets, but you can control the pace and ensure students have the time and hands-on practice they need to grasp important concepts and develop targeted skills. Nearpod includes a feature called "Browse the Internet," which is useful when you need to guide students to specific sites, and an interactive whiteboard feature called "Draw It." Imagine an interactive presentation in which each student not only

experiences content delivery through a handheld device but also responds to embedded questions, prompts, and cues anonymously and expresses understanding through writing and drawing.

From a formative assessment standpoint, Nearpod collects the data students generate and offers data analytics that you can review in real time or use to generate session reports down the road. Similar to how a teacher may use the web audience response system Poll Everywhere or the online quiz feature in Google Forms, a teacher using Nearpod can assess understanding by prompting students to answer questions or reflect and share directly with the teacher or class. Easy-to-read reports displaying graphs of student responses provide insight into their understanding—powerful formative data for shaping instructional next steps and further discussion.

For an example, let's look at Arlene Hopkins's 6th grade social studies classroom during a lesson on the Peloponnesian War. Ms. Hopkins formed teams of students to represent the rival city-states of Athens and Sparta and provided each team with information limited to what the citizens of each city-state might have known. Students accessed online materials from the Ontario (Canada) History and Social Sciences Teachers' Association (www.ohassta.org) and read about and discussed events from the viewpoint of a family from their own city-state.

Ms. Hopkins posed questions at important decision points, such as when the Athens and Sparta teams were contemplating an invasion. She used the Nearpod app on her tablet to graph the results, and students from the rival

city-states were then able to see what the other team had decided. When team members met to make their decisions, Ms. Hopkins observed their processes and provided questions, prompts, and cues to scaffold understanding. “The instantly available analytics made it possible for me to see their thinking evolve and to meet strategically with teams as needed for their learning to move forward,” she said. “I think them getting to see the thinking of others was really important, too, because it gave them a glimpse of how limited access to information shapes decisions throughout history.”

Asynchronous guided instruction. In the past, it was impossible to offer guided instruction outside of the face-to-face contact of teacher and student. Tablet teaching and the Internet have changed that. Many educators are familiar with the video tutorials developed by Salman Khan, for example. With the ShowMe app, which basically turns a tablet into a blank canvas for drawings and inserted images, teachers can easily create their own video lessons. These lessons might be recorded during live, face-to-face classes and then archived for reference during out-of-class assignments, or they might be developed separately and linked to specific points in online content delivery, serving as cues (purposeful shifts in attention) to direct students to particular content.

When students are trying to master new content, it isn't uncommon for them to forget to apply skills and knowledge they've previously learned. In fact, this is a defining feature of a novice—one who may process some declarative or procedural knowledge but not the conditional knowledge of when to use it (Brown, 1987). Here's where the ability to refer

students back to previously recorded lessons is extremely useful. For instance, an elementary student composing a written opinion piece might have trouble deciding how to conclude her piece. If the teacher linked recordings of the previous month's writing lessons to the LMS the student was using, then the student could review those lessons to become "unstuck." Another trip through the lesson on writing conclusions might be just the prompt necessary to the student's prior knowledge and resolve her difficulty. Dynamic learning approaches such as this can also be an invaluable resource for families who can access past lessons when assisting their children with homework.

Quick Tips for Using Tablets During Guided Instruction

A tablet can broadcast its image onto a projector, as we've discussed, or, in the case of the Nearpod app, onto student devices. The ShowMe app, once you've downloaded it, installed it on your tablet, and created an account, allows you to store and manage recorded learning sessions. You can link to and embed these sessions from the URL, or you can embed code provided from the ShowMe website (www.showme.com).

To use Nearpod, you'll need to install it on both your tablet (the presenter device) and students' devices. Students can also use the iPad or iPhone versions of Nearpod. After you've downloaded and installed Nearpod, visit the website (www.nearpod.com) to create an account. Once you're logged in, you can create slideshow presentations by

uploading PDF versions of images or existing PowerPoint presentations you've saved as a PDF. When your slides are in, you can go ahead and insert various interactive features, such as polls and Draw It boards.

In-class implementation is simple. Start the Nearpod presentation from the app on your tablet and provide students with the session code. Students input the session code on their tablets to connect with your session. As they log in, you'll see them listed on a presentation roster. When everyone is connected, the presentation can begin, and you'll control the pace. When you slide a finger across your tablet screen to advance to the next slide or activity, all students will see the presentation slide change on their devices.

Collaborative Learning: Working Together to Solidify Understanding

Perhaps no phase of learning is more critical than when students work with their peers to consolidate their thinking and practice new skills (Frey, Fisher, & Everlove, 2009). In the classroom, this is most often done in large and small groups, where students provide feedback on one another's work, talk about concepts and ideas, make connections between the content and their own lives, and create new products together.

The kinds of speaking and listening skills essential in collaborative group work are noted in the Common Core State Standards for English Language Arts as pivotal to meeting various standards in reading, writing, and language and to becoming college and career ready:

Whatever their intended major or profession, high school graduates will depend heavily on their ability to listen attentively to others so that they are able to build on others' meritorious ideas while expressing their own clearly and persuasively. (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010, p. 48)

It is the collaborative learning phase of instruction that's most at risk of being diminished if tablets are not used skillfully. After all, students who spend too much class time working alone on a tablet miss perhaps the most valuable resources at their disposal: their classmates. A simple way to sidestep this hazard is to adjust the tablet/student ratio. Simply requiring two or more students to share a tablet can be enough to prompt the kind of face-to-face interactions that benefit all students. The tablet-sharing method of collaboration, with individuals contributing ideas to produce a product that collectively represents their group's thinking, is particularly advisable for younger students and for those who have limited experience working interactively in a digital environment. It allows the latter group to capitalize on a communication mode with which they are familiar (face-to-face conversation) while giving them the knowledge-extending benefits of working in an online collaborative environment.

Third grade teacher Dominick Cook uses the TypeWith.me app installed on his students' tablets to encourage online interaction within the regular classroom environment. The TypeWith.me app is a web-based, real-time collaborative

tool that allows up to 16 users at a time to work on the same document. “What makes this app user friendly for my students is the fact that each writer’s contributions are highlighted in a different color,” Mr. Cook said. “This gives students a way to see who is adding to their group’s writing and how.” Although TypeWith.me has an online function, Mr. Cook encourages his students to speak to one another. “I like the fact that they are getting some experience writing collaboratively, but they’re still able to turn to someone in the group and ask, ‘Why did you change that word?’ It’s a good way to scaffold their learning about how to collaborate when they are not sharing the same physical space.”

Chemistry teacher Angie Holbrook uses online collaborative tools to support analytical skills and deepening content knowledge. As students in her various class periods complete labs, they upload their data and results to an online spreadsheet. The following day, each class period reviews and discusses the collective results of the lab, analyzing quantitative and qualitative data from a far larger sample size than their class alone. Ms. Holbrook encourages students to investigate why individual results might have varied and discuss whether these outliers are meaningful or the result of procedural error.

As this example illustrates, collaborative learning is more than talking and listening to one another; students also need to interact with the content. If you have a class set of tablets, consider building a tiered collaborative setting. This means assigning each member of a team a different tablet-enabled task that ultimately contributes to a single end product. A

typical example would be students researching specific topics online, with all members of a group documenting their findings on a shared document stored in Google Drive. You might also set up tablets to act as learning stations, with small groups of students using the tablet at different stages of the collaborative project. You'll recall that decisions about how students find, use, create, and share information are an essential part of the planning process; we find that revisiting the purpose with students helps them seem beyond the directions and refocus on the learning.

You might also organize groups around the use of a single tablet, with a Nearpod app loaded and synced into the session. With this set up, you can prompt groups to reflect on lesson content, represent their understanding in a new way, and answer questions about the content. The application generates a considerable amount of formative assessment data on the groups' collective understanding. For a more active collaborative learning activity, you might have student groups use the augmented reality app Aurasma to take part in a scavenger hunt or gallery walk. Aurasma allows you to link video, animation, and other media to create all kinds of multimedia-enhanced activities and presentations.

Kindergarten teacher Shawna Williamson used Aurasma to create a collaborative multimedia activity for her classroom reading center. She took digital photographs of animal images students had seen in the picture book *What Do You Do with a Tail Like This?* (Jenkins, 2008) and linked them to short videos about those particular animals. Students paired up, with one tablet between them, tapped the

trigger images, and watched the videos. Ms. Williamson also recorded herself asking discussion questions, which the students accessed and talked about together. “It’s already such an interactive book, so it seemed like a natural place to begin using augmented reality in my classroom,” she said. “I’m thinking about doing this with more of my collaborative reading books. That way, when I’m doing guided instruction with a small group of students, I can still make sure that the reading center remains interactive and content-rich.”

Students also need experience creating original content together. Science students in Miguel Alvarado’s 7th grade Earth Science class formed teams to specialize their research about unusual weather phenomena, including the haboob, supercells, graupel hail (a contributor to slab avalanches), and ball lightning. Designated team members conducted research, located appropriate video and still images, and wrote informational articles about their phenomena. Each team went on to develop an informative visual essay using Haiku Deck, a presentation software for tablets. The teams also used an online collaborative tool to warehouse their collective work, drafted group presentations, and then posted the presentations on the school’s LMS for their classmates to view.

“I tried to close the circle on collaboration by creating a section for comments from each of the viewers in the class,” Mr. Alvarado explained. “Students were required to post questions to the creators of each visual essay. In addition, each team had to review the viewers’ questions and generate a group response.” Though the tablet was an important tool for gathering information and creating products, the

chance to view, question, and respond to others in a digital environment elevated the project. “They are getting a chance to develop content for a real audience and get feedback about what was understood and what was confusing,” said Mr. Alvarado. Based on the feedback from their classmates, the teams used one more class period to revise and finalize their visual essays. “It’s what we do all the time, right? We put content out there, get feedback, and then polish it up. It’s a great experience for them to work together and to work with an audience in mind.”

Quick Tips for Using Tablets During Collaborative Learning

If every member of a student group has access to a tablet, one of the best ways for them to collaborate is to use apps that allow them to create in real time and share the outcomes with one another. Google Apps for Education allows teachers to create and manage students’ Google accounts. These accounts provide students with Gmail accounts and access to many of Google’s web applications. Google accounts can be used on tablets to access Google Drive, a collaborative productivity suite. Once a student logs in and creates a Google Doc, this document can be seen and edited by others with site access. Cloud storage services such as Dropbox allow users to upload, share, and work on documents from tablets and other devices. With Dropbox, you can make files available for class access and ask students to collaborate by editing or reflecting on the shared document. Students can upload and share documents with other members of their

group (or you) for further review. There are many other cloud services that allow users to collaborate, but they all facilitate the same fundamental function.

Independent Learning: Applying Understanding in Novel Situations

In this phase of the instructional framework, students are fully applying the content they have been learning. Note that this is not “practice”; the learning continues as students find novel applications for the lesson’s concepts and skills. For instance, when a student conducts research on a topic, writes an essay about it, and develops a presentation for others, he or she is continuing to learn about that concept. It is vital that the independent tasks you set for students are not low-level assignments that require them to regurgitate what they already know.

The Literacy Design Collaborative (www.literacydesigncollaborative.org) has developed useful task templates that encourage students to continue to build their knowledge during the independent learning phase. These templates are further organized by the critical-thinking skills required: analysis, comparison, evaluation, problem–solution, cause and effect, definition, description, procedural–sequential, and synthesis. As an example, one task template for evaluation reads as follows:

After researching _____ (informational texts) on _____ (content), write a/an _____ (essay or substitute) that discusses _____ (content) and

evaluates _____ (content). Be sure to support your position with evidence from your research. (Literacy Design Collaborative, 2013)

Used in a biology class, this template might generate the following independent learning task:

After researching scientific research articles on stem-cell research, write an essay that discusses the ethics of the research and evaluates its potential. Be sure to support your position with evidence from your research.

Quick Tips for Using Tablets During Independent Learning

Tablets are a great tool for conducting independent research and inquiry. Using them in this way is also in line with the Common Core State Standards' call for students to use technological skills to locate information and demonstrate understanding. Remember that proficiency with hardware and software, like any other skill, is developed over time. The popular and relatable tablet is an excellent starting place. Through it, we can expose students to a wide variety of technology-based tools for collaboration and creation, many of which are built on similar fundamental functions, such as storing information for later use, creating new products, and sharing information with others. If you design independent learning tasks that give students some choice of online tools and apps—and if you educate yourself enough to provide

the necessary guidance—you can prepare your students to become more resourceful technology users and producers as they further their learning in the content areas.



Practical Considerations of Teaching with Tablets

Agreeing that a tablet is a great tool should not automatically result in the purchase of a cartful. It's essential to think about what you want to achieve with tablets, what you are going to need to teach well with tablets, and how you are going to go about it on a practical basis. Anyone who sets out to improve learning through an infusion of technology must be prepared to deal with four factors: instructional alignment and apps, technical support, infrastructure requirements, and ongoing professional development.

Instructional Considerations: Alignment and Apps

A tool's educational value depends on how well it complements your school's or your personal instructional model and teaching practices. Begin by asking the following questions:

- How compatible are tablets with the content of my course?
- How compatible are tablets with my teaching approach?

- In what ways might tablets disrupt my teaching approach?

To answer these questions, outline the standards and topics of the course and then consider what functions to utilize in your classroom (Frey, Fisher, & Gonzalez, 2010):

- Searching for information
- Listening for and viewing information
- Storing information
- Communicating information
- Collaborating with peers
- Producing information
- Presenting information
- Sharing information
- Networking with other learners beyond the classroom

Once you have paired content and tablet functionality, you'll be able to create classroom procedures that are more clearly aligned to your instructional purposes. You'll also be able to select the best apps for the job.

The development of apps for tablets is accelerating, and it is nearly impossible to weed through all of the new items produced each week. Even tools such as Google Apps for Education (www.google.com/enterprise/apps/education) and the education apps sorted in the iTunes App Store are little more than lists.

We have found that the EdTechTeacher website has a useful screening tool for examining apps (<http://edtechteacher.org/index.php/teaching-technology/>

mobile-technology-apps/ipad-as). Users first specify the desired app function—how they want students to use the tablet (For example, I want my students to... annotate course readings/improve their organization/respond to questions, polls, and assessments.) Each function is linked to a list of apps that includes a brief description of each, along with price, ease of use, and a rating. For example, apps for promoting collaboration include Subtext, a free synchronous app that allows teachers to populate a reading with questions. As students read and discuss, they add their answers and insights via the interface on their tablets. The teacher is able to monitor the comments generated in these text-based, small-group discussions in real time, even when he or she is not physically present with the group. EdTechTeacher rates this app as “medium” in terms of difficulty.

Finding an app that will allow your students to perform the identified function is an important aspect of the selection process. However, an equally important consideration is the degree to which an app will help your students meet the lesson’s learning goals. Effective teachers always factor student needs into any instructional decision. For this reason, web-based review sites from teacher-contributors are invaluable. One stellar example is I Education Apps Review (www.iear.org), where an online community of educators share their respective takes on educational apps. This site includes student reviews as well.

Several review sites overlay Bloom’s taxonomy with app reviews. Edutopia focuses specifically on apps used in K–5 education (

blooms-taxonomy-diane-darrow). Another site, sponsored by long-time educational blogger Kathy Schrock, looks at apps across elementary and secondary classrooms (www.schrockguide.net/bloomin-apps.html). Schrock also provides a useful rubric for discussing the merits of apps being considered for a grade level or course (http://kathyschrock.net/pdf/ipad_app_rubric.pdf).

Tablets offer so many ways to present content and connect students to that content. Whether modeling note-taking skills with an app like Notability or engaging in an interactive lecture using ShowMe, tablets can enhance high-quality instruction. Still, the features, content, and functionality must align with the overall learning environment. Before moving forward with any app, remember to think about classroom practices, behaviors, and culture. After all, an app doesn't exist in a vacuum; it will be used by your particular group of students, within your physical and virtual classroom environment.

Technical Considerations: Compatibility and Support

One of the tablet's most desirable features has to do with compatibility—the fact that it's possible for teachers to use it to deliver instruction, engage students, and assess learning without devoting an extraordinary amount of time to making everything “work.” For example, in the early days of such devices, it wasn't uncommon to hit a wall when attempting to access web content created with Adobe's Flash browser plugin. Fortunately, there has been a rise in web services that

can handle the needs of popular mobile devices and their users and deliver cross-platform compatibility. We welcome this trend because, as educators, there is little we fear more than a lesson coming to a halt due to technical difficulties.

However, more cross-platform compatibility doesn't eliminate the need for technical support, which is critical for deploying and maintaining classroom technology. The primary role of technical support staff is twofold: (1) understand and address the needs of both teacher and students, and (2) understand and accommodate the lesson's purpose. We recommend setting up an appointment with your school's technical support staff to discuss your vision for using tablets and consider how you might achieve that vision together.

When new technology is being implemented, hiccups are inevitable. The key is to expect them and figure out how you will respond. In order to develop such a plan, the technology support and instructional staff should discuss the following questions:

- Is there a system in place to monitor the deployment, use, and maintenance of the tablets, or will we need to design one?
- What evidence will we use to monitor successes and challenges during initial plan implementation?
- What evidence will we accept that the incorporation of a tablet system is enhancing student learning?

The technical staff's role is also one that requires them to be open and available to listen to what is happening in the

classroom. Narrowly implementing technology without following up on the usefulness of devices, software, and procedures can dim an educator's enthusiasm for it. Furthermore, negative experiences can limit students' opportunities to develop technical skills. For these reasons, monitoring tablet deployment must be an ongoing effort and not confined to the initial weeks when the devices are still new and unfamiliar to teachers and students.

Mobile management tools are available to help technical staff deploy devices that mirror one another and can provide students with the same high-quality experience, regardless of which tablet they pick up each time. Technical support must focus on the users, the apps they are using, and the security necessary to guarantee ready access while adhering to safety and security guidelines.

Infrastructure Considerations: Connectivity and Online Access

Support for a user's know-how is important—as is support for the device itself. Of course, putting a cart filled with tablets into a classroom and having a lesson ready, apps loaded, and students ready to go all require a capable network infrastructure. Many of the apps we use, not to mention the content we access, require an Internet connection. For teaching with tablets to be a viable option in school, the wireless capabilities of the classrooms must be revamped to manage the higher density of signals.

The online services that deliver content are another form of infrastructure to consider. For many teachers who

successfully teach with tablets, teaching extends far beyond their classroom walls. They use their tablets to capture their lectures and publish them online via their LMS. The topic of blended learning is a much broader discussion, but we do have to acknowledge that tablets play a role in the much larger playing field of the educational technology ecosystem. Tablets supply the tools to help create, publish, and share content conceptualized within a classroom. These ideas can then be carried out to an online space where students have control over when and how to access them.

Professional Development Considerations: Continuous Improvement and Innovative Practice

Education blogger Jennifer Carey (2012), reporting on the first iPad Summit at Harvard Medical School in November 2012, put it this way:

You cannot simply “add iPads and stir.” Simply handing out iPads to teachers and students (and going over the security protocols) isn’t going to accelerate learning in your school. Educators need to become skillful at using these tools and then think deeply about how to integrate them into the learning environment in powerful ways. (para. 6)

To make the best use of tablet technology, teachers need time and opportunities to explore new tools on an ongoing basis. At our school, Alex introduces new tools and then creates a virtual sandbox that encourages us to play—and

allows us to experience failure (a necessary component of the learning process). For example, our school implemented a new learning management system that required training in the logistics of operating the program. However, a point-and-click workshop is woefully inadequate for anything more than an introduction to using an LMS.

Our answer was to create authentic opportunities for teachers to become learners. We used the new LMS to create professional development modules for each of the mandatory training sessions required for our district—topics such as universal health precautions and mandatory abuse reporting—and required staff members to complete those modules, take the associated online tests, and submit evidence of their learning. This immersion gave teachers an immediate sense of how they might create modules for their own content. Throughout the year, Alex provided all of us with tasks to complete (e.g., create a quiz, create a discussion board) and then had volunteers share what they had created in professional development meetings. He also hosted a “Tech Minute” during our daily 10-minute morning staff meetings to profile tools, which he later listed on Google Drive for easy reference. Over time, others on staff shared their own Tech Minute finds.

Professional development for tablet implementation must of course align with research-based principles of effective professional learning, as outlined by Carr and Harris (2001). That means it must

- Be driven by a well-defined image of teaching and learning.

- Provide opportunities for teachers to build their knowledge and skills.
- Use or model the strategies teachers will use with their students.
- Help build the learning community.
- Allow teachers to take leadership roles.
- Create links to other parts of the educational system.
- Be continually assessed and improved.

Of course, a tablet is only a tool. It cannot provide innovation in itself; innovation comes from the discoveries that take place when teachers and students put tablet technology to use. In other words, some of the best ideas come from the users themselves—especially during their conversations with one another: *Did you know you could do this? Do you know how to do that? Look what happens when we do this!* These are the moments that help teachers create truly exciting learning experiences for our students, and they are the product of time allowed for interaction, sharing, and play. Inquiry is ignited when one has control over how to interact with the content before them, and both teachers and technical support staff should take time to observe these instances and discuss them with fellow tablet users to explore what else you might do with tablets. Think of it as creating your own learning community where each individual is a resource for others to look to when they need assistance and innovative ideas.

The hesitation surrounding teaching with tablets stems from uncertainty about how, when, or why we should alter instructional strategies to accommodate this new technology. Trends show schools are adopting tablets at a rapid pace, but when we look at what tablets are actually being used for, and whether tablets are really supporting and improving learning, the results are mixed.

Our primary interest is to develop effective instructional strategies. As we keep an eye on educational trends and the shifting delivery platforms available, we look for ways to understand what teachers are doing now, and we vet the value of these approaches based on what we know works. We are very excited about the potential of tablet instruction to bring personalized support for students. We like how it allows teachers to create enhanced content that extends learning well beyond the walls of the classroom and permits students to interact with peers in virtual workspaces. Like most tablet users, we appreciate the tool's bells and whistles, all of the exciting apps and services, and the functionality and comfort that comes with using them. Still, our priority—and yours too, we believe—is to integrate this powerful tool with effective instruction that supports meaningful learning. Do tablets belong in the classroom? Yes. Will they change education? They can. Are teachers ready to use them? Only if we engage in purposeful planning for high-quality instruction and sufficient support.

To give your feedback on this publication and be entered into a drawing for a free ASCD Arias e-book, click here or type in this web location: **www.ascd.org/ariasfeedback**



ENCORE



A Checklist for Lesson Planning with Tablets

Focused Instruction: Establishing Purpose <i>Inform students of the learning target and provide them with the goals they will measure their progress against.</i>	
<input type="checkbox"/> What is the content purpose for the lesson? <i>(e.g., to identify the reasons for constructing the Intercontinental Railroad)</i>	
<input type="checkbox"/> What is the language purpose for the lesson? <i>(e.g., to use textual evidence from historical documents to support the reasons identified)</i>	
<input type="checkbox"/> What is the social purpose of the lesson? <i>(e.g., to collaborate with peers to locate and compile evidence)</i>	
<input type="checkbox"/> How will I establish purpose for students? <i>(e.g., face-to-face explanation, screencast on LMS module, written header in a shared document)</i>	

Student Task(s) for the Lesson	
<i>Collaborative and independent student tasks that give students the opportunity to put content knowledge into play and generate evidence of learning.</i>	
<input type="checkbox"/> What collaborative tasks (CT) will students complete?	
(CT) What digital and print-based information do students need to find ? (e.g., <i>via online search, WebQuest</i>)	
(CT) What digital and print-based information do students need to use ? (e.g., <i>notes taken, annotations, course readings, video or audio recordings</i>)	
(CT) What digital and print-based information do students need to create ? (e.g., <i>digital story, presentation, written content</i>)	
(CT) What digital and print-based information do students need to share ? (e.g., <i>blog posts, discussion board comments, video conference</i>)	
<input type="checkbox"/> What independent tasks (IT) will students complete?	
(IT) What digital and print-based information do students need to find ? (e.g., <i>via online search, WebQuest</i>)	

<p>(IT) What digital and print-based information do students need to use? (e.g., <i>notes taken, annotations, course readings, video or audio recordings</i>)</p>	
<p>(IT) What digital and print-based information do students need to create? (e.g., <i>digital story, presentation, written content</i>)</p>	
<p>(IT) What digital and print-based information do students need to share? (e.g., <i>blog posts, discussion board comments, video conference</i>)</p>	
<p><input type="checkbox"/> Tablet/student ratio requirements (e.g., 1:1, 1:4)</p>	
<p><input type="checkbox"/> What apps will students require to complete the task?</p>	
<p style="text-align: center;">Focused Instruction: Modeling and Thinking Aloud</p> <p style="text-align: center;"><i>Present lesson content, using modeling to demonstrate processes or skills. Think aloud to give learners insight into how an expert understands the content or the process.</i></p>	
<p><input type="checkbox"/> What skills, strategies, and content do I need to model for students?</p>	
<p><input type="checkbox"/> How will I deliver this modeling?</p>	<p><input type="checkbox"/> Face-to-face <input type="checkbox"/> Digitally</p>
<p><input type="checkbox"/> If modeling will be delivered digitally, what tools are needed?</p>	<p><input type="checkbox"/> Screencast <input type="checkbox"/> Video demonstration <input type="checkbox"/> Audio recording <input type="checkbox"/> Other ()</p>

<input type="checkbox"/> Will I archive my think-aloud for students' later use? If so, how will it be archived?	
Guided Instruction <i>As learners apply the lesson's skills, strategies, or processes, ask questions and provide prompts and cues to redirect them toward understanding.</i>	
<input type="checkbox"/> What are the key questions I will pose to students?	
<input type="checkbox"/> What prompts can I use to facilitate cognitive or metacognitive work?	<input type="checkbox"/> Background knowledge <input type="checkbox"/> Process or procedure <input type="checkbox"/> Reflective <input type="checkbox"/> Heuristic
<input type="checkbox"/> What cues will I need to shift students' attention when they are not able to answer?	<input type="checkbox"/> Visual <input type="checkbox"/> Gestural <input type="checkbox"/> Positional <input type="checkbox"/> Environmental <input type="checkbox"/> Verbal <input type="checkbox"/> Physical
<input type="checkbox"/> Will these questions, prompts, and cues be delivered face-to-face or digitally?	<input type="checkbox"/> Face-to-face <input type="checkbox"/> Digitally (e.g., polling devices)
<input type="checkbox"/> Will these questions, prompts, and cues be embedded into digital content? If so, how?	<input type="checkbox"/> In digital text <input type="checkbox"/> Through video annotation <input type="checkbox"/> Study link to digital notes (e.g., Evernote Peek) <input type="checkbox"/> Other ()

Collaborative Learning	
<i>Groups of learners work together via face-to-face and digital interaction to apply skills, strategies, and knowledge and gain a deeper understanding of the material.</i>	
<input type="checkbox"/> What is the rationale for the construction of the group?	<input type="checkbox"/> Homogeneous <input type="checkbox"/> Heterogeneous <input type="checkbox"/> Student interest <input type="checkbox"/> Student choice
<input type="checkbox"/> What workspace will students use?	<input type="checkbox"/> Physical space <input type="checkbox"/> Interactive whiteboard <input type="checkbox"/> Collaborative document <input type="checkbox"/> Audio file <input type="checkbox"/> Video file <input type="checkbox"/> Presentation file <input type="checkbox"/> Other ()
<input type="checkbox"/> In what ways can students witness one another's thinking in real time? (e.g., <i>face-to-face, synchronously</i>)	
<input type="checkbox"/> If asynchronous, in what ways can students utilize evidence of others' thinking to forward their own understanding?	
<input type="checkbox"/> How will students engage in meaningful discussion using academic language, not just low-level exchanges of information?	
<input type="checkbox"/> In what ways can the group make useful errors that can lead to new understanding?	

<input type="checkbox"/> How will students access language support in a digital environment? (e.g., <i>sentence frames for written content, digital dictionary, thesaurus</i>)	
Independent Learning <i>Students extend and expand understanding of what has been taught, both skills and habits of mind (metacognition and self-regulation).</i>	
<input type="checkbox"/> What is the purpose of the independent learning task?	<input type="checkbox"/> Application <input type="checkbox"/> Fluency building <input type="checkbox"/> Spiral review <input type="checkbox"/> Extension
<input type="checkbox"/> How will students receive feedback ?	<input type="checkbox"/> Face-to-face <input type="checkbox"/> Written <input type="checkbox"/> Digitally
<input type="checkbox"/> How will I ensure the feedback is timely ?	
<input type="checkbox"/> How will I ensure the feedback is understandable ?	
<input type="checkbox"/> How will I ensure the feedback is specific ?	
Formative Assessment to Inform Future Instruction <i>Throughout the learning cycle, use various formative assessment tools to check for understanding; make instruction adjustments based on students' performance.</i>	
<input type="checkbox"/> How will I collect student performance data to check for understanding?	<input type="checkbox"/> Oral language <input type="checkbox"/> Written language <input type="checkbox"/> Performance or project <input type="checkbox"/> Quiz or test

<input type="checkbox"/> How will I analyze the data for patterns and common errors?	
<input type="checkbox"/> What apps do I need for data collection and analysis?	<input type="checkbox"/> Course dashboard <input type="checkbox"/> Learning management system <input type="checkbox"/> Test analyzer application <input type="checkbox"/> Test scanner <input type="checkbox"/> Adaptive diagnostic assessment <input type="checkbox"/> Online markup tool <input type="checkbox"/> Online spreadsheet <input type="checkbox"/> Other () <input type="checkbox"/> Other ()
<input type="checkbox"/> How will I share the assessment results with students?	<input type="checkbox"/> Face-to-face conference <input type="checkbox"/> Online conference <input type="checkbox"/> Online grade book <input type="checkbox"/> Performance summary



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Related Resources

At the time of publication, the following ASCD resources were available (ASCD stock numbers appear in parentheses). For up-to-date information about ASCD resources, go to www.ascd.org. You can search the complete archives of Educational Leadership at <http://www.ascd.org/el>.

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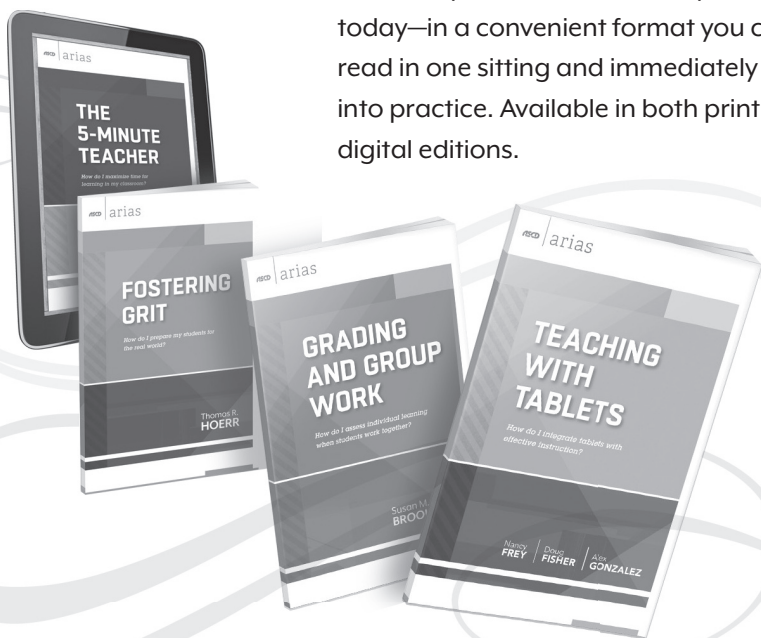
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TEACHING WITH TABLETS

How do I integrate tablets with effective instruction?

In the few short years since tablets were introduced, they have become a popular addition to classrooms across all grade levels and content areas. By putting this device in the hands of students and teachers, we can grab hold of their interest, interact with content on a more personalized level, and monitor real-time learning. But how we use tablets in the classroom needs thoughtful planning to ensure that the technology actually improves the teaching and learning process. Nancy Frey, Doug Fisher, and Alex Gonzalez offer practical advice on how to effectively use tablets as part of the gradual release of responsibility from teacher to student. You'll learn how to ensure that tablets are integrated into high-quality instruction, including strategies for using tablets for modeling, guided instruction, collaborative learning, independent learning, and formative assessment. Filled with examples of teachers successfully using tablets in their classrooms, this resource will help you maximize the potential of tablet technology to facilitate student understanding.



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