TESOL Connections
Keeping English language professionals connected

Building Higher-Order Thinking Skills With Technology
by Becky Shiring

More than ever, today's world requires us to think critically, work collaboratively, and adapt quickly. Students must be able to persist through ambiguity and be comfortable navigating rapidly changing technologies. Unfortunately, many of today's employers report a large portion of employees are underskilled when it comes to digital competence in the workplace. In a survey of adults from 33 countries, over half of those from the United States performed below proficiency in problem solving in technology-rich environments, which includes the ability to problem solve for work purposes using technology (OECD, 2016).

Research on cognition in the classroom often shows that teachers spend the majority of their time teaching and assessing lower order skills, such as basic recall (Cotton, 1988; Marso & Pigge, 1993). To equip students with the skills needed for success in a rapidly changing world, teachers must move beyond teaching and assessing basic comprehension. Students need opportunities to engage in authentic, cognitively challenging tasks that build both technology and critical thinking skills. Activities that promote higher order thinking require students to analyze information, synthesize concepts, and create something new from existing knowledge. These activities are complex, nuanced, and require mental effort on the students' part.

Planning cognitively challenging tasks for English learners (ELs) seems intimidating. For students already struggling with the language to fully express themselves, it can feel like adding an extra layer of complexity. But with the help of the strategies and tools outlined in this article, it's easy to provide all students with opportunities to improve digital fluency, develop language, and build higher order thinking skills.

Strategy 1: Make Connections

When students are able to connect new knowledge to personal experiences and real-world examples, concepts are more impactful and engagement increases. Allowing students to see concrete examples of concepts that are taught in isolation in the classroom also helps new language stick. Two tools that can be used to help students make connections are Padlet and a simple digital camera.

Padlet is a digital corkboard that allows users to post images, links, documents, videos, and more. The tool allows for group boards and a supports variety of media, making it ideal for ELs

who benefit from collaborative work and alternatives to text-based responses. Students can use Padlet to make connections by creating mind maps, like in this environmental issues example. Another great connection-building activity is Connect Four. This is an activity outlined in the book *Deeper Learning: 7 Powerful Strategies for In-Depth and Longer-Lasting Learning* by Eric Jensen and LeAnn Nickelsen (2008). In this activity, students complete a four-column graphic organizer connecting a topic to their personal life, the media, the nation, and the world. Using Padlet to complete this activity instead of a paper-based graphic option allows students to leverage multimedia-rich content, improving digital literacy and building higher order thinking skills. See how this activity comes to life with the Padlet version here.

Another way to bridge the classroom with the real world is to simply ask students to notice what's around them. As an easy, fun homework assignment, ask students to take pictures of new vocabulary or concepts outside of the classroom. For example, during a lesson about environmental issues, ask students to find an example of positive or negative environmental practices in their own neighborhood and snap a photo. In the image shown in Figure 1, a student took a picture of an electronic vehicle charging station highlighting a business in their community with a positive impact.

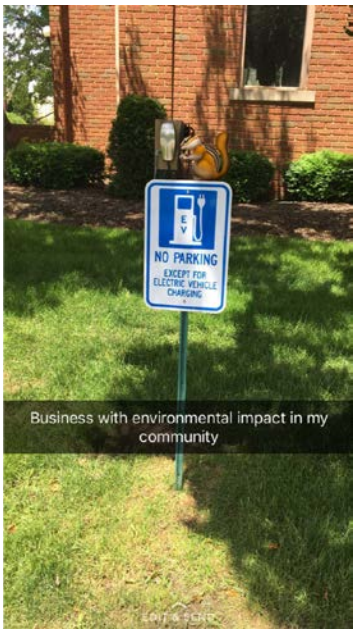

Figure 1. Student photo highlighting an environmentally friendly local business.

Once students take their photo, it can be shared through email, posted to a class site, or uploaded to a photo sharing platform like Flickr. For more details about using Flickr in the classroom, see this blog post.

Strategy 2: Get Visual

Research shows that when visual imagery is used in conjunction with verbal processing, information is retained better (Clark & Paivio, 1991). Furthermore, allowing students to represent concepts visually provides an alternative option for those who may not have the

vocabulary to explain a concept verbally. “Sketchnote” summaries and infographics are two ways students can connect the verbal with the visual.

Sketchnotes

One activity is to have students sketchnote a summary of top takeaways or key ideas after reading an article. This simply means allowing students to represent their understanding with a combination of images and text. A great tool for this is Google’s Autodraw. Autodraw uses machine learning to predict what is being drawn and then presents a variety of polished images to choose from. The tool also allows for freehand drawing and text entry, and the final product can be downloaded or shared via URL. In this video example, a student is using Google Autodraw to create a sketchnote summary based on an article about the human brain. The finished product (Figure 2) was made available online here.

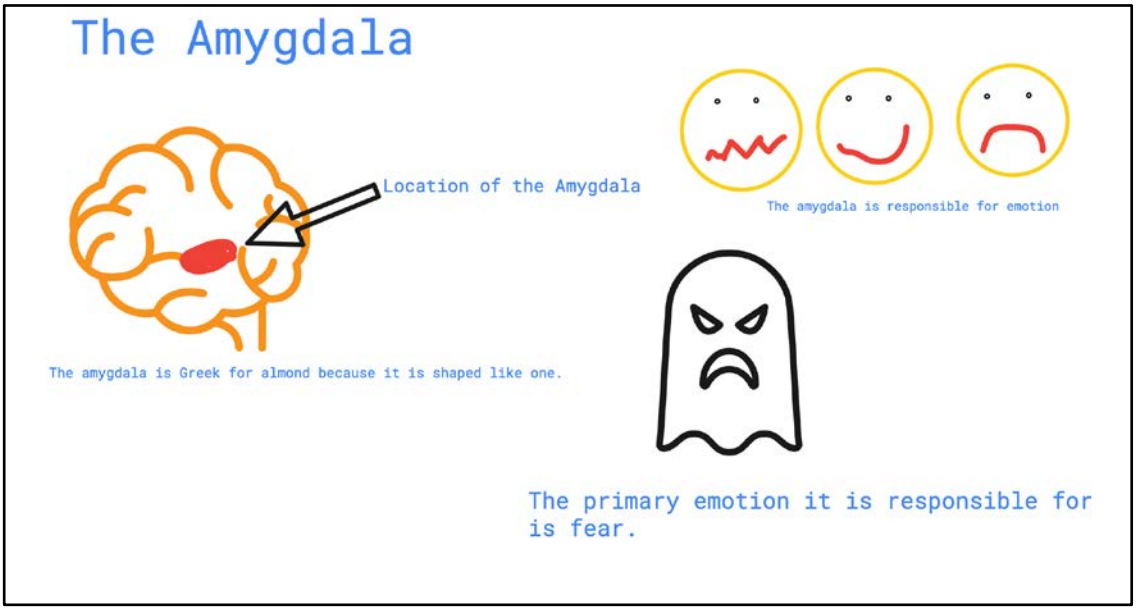

Figure 2. Student sketchnote summary using Autodraw.

Infographics

Having students create an infographic, a visual representation of information and data, is another useful activity for promoting higher order thinking skills. Canva is a great tool for getting started with infographics in the classroom. There are thousands of ready-made templates to choose from that can help guide students who have never created an infographic before. In this video example, a student is using an existing template to create an infographic about Ernest Shackleton after a unit on Arctic explorers. (See the finished product in Figure 3.) As an added bonus, Canva has a Design School that includes quick, hands-on lessons that teach the basics of the program and best practices in design.

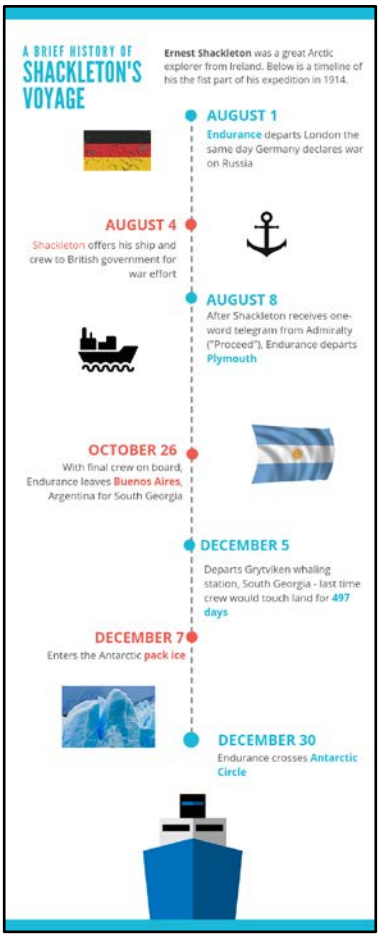

Figure 3. Student infographic example.

Strategy 3: Talk About It

Asking students to present information to others, formally or informally, is immensely valuable in building higher order thinking and language skills. When students learn with the expectation that they will have to teach others, information is processed more deeply. Students have to think critically, deciding which information to include and how to present it to a target audience. However, creating well-structured, visually appealing presentations from scratch is no easy task. My Simple Show and Slides Carnival are two great tools to help scaffold the process for students.

My Simple Show is a tool that allows users to make highly visual, well-structured presentations. There are four simple steps that help scaffold the presentation design process. In the first step, students choose a topic template. Some example topics include discussing pros and cons of a topic, summarizing a historical event, explaining an idea, and comparing options to make a decision. In the next step, students write the content for their presentation. Each template includes an outline with advice and examples for structuring the presentation based on the nature of the topic (see Figure 4). By providing a model and examples, the tool helps ELs achieve success when working on complex writing tasks.

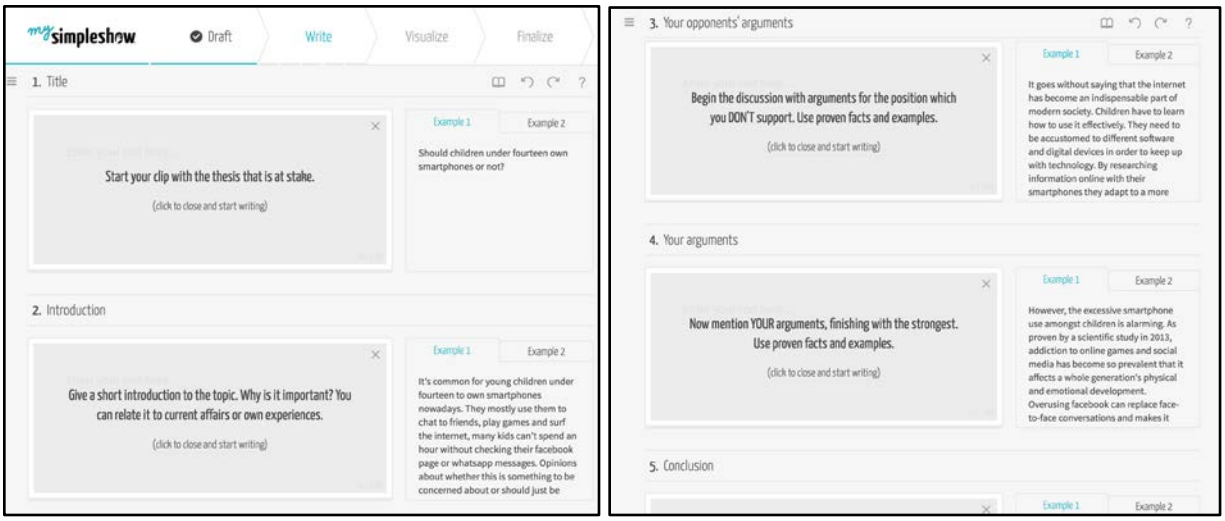

Figure 4. Presentation outline with advice and examples.

Step 3 allows students add graphics to their presentation. My Simple Show automatically provides relevant images based on keywords, minimizing the often disproportionate time students spend searching for graphics. The final step adds audio. Students have the option of adding a voiceover or using the tool's text-to-speech feature. The voiceover feature allows students to rehearse and build speaking confidence. The video is then published and can be downloaded or shared using a link. You can see a variety of examples on the My Simple Show website here.

Slides Carnival is another tool that helps support students in creating dynamic presentation. This website has a plethora of free presentation templates for PowerPoint and Google Slides. Each template contains instructions for use and a variety of different slide types with design advice embedded within. For example, the bulleted-list slide reminds you, "Remember not to overload your slides with content; your audience will listen to you or read the content but won't do both." (See Figure 5.) This helps users create engaging, persuasive, visually appealing presentations and is useful for students and teachers alike.

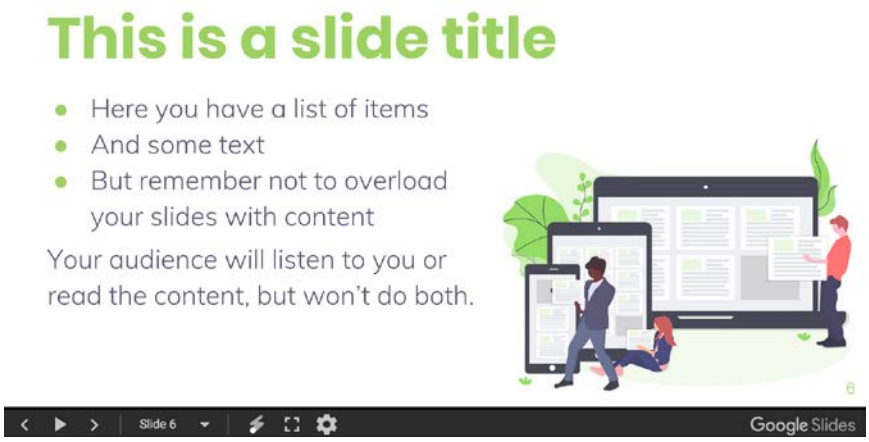

Figure 5. Example slide template with embedded design tips.

There are countless tools that can be used to promote higher order thinking, and the technology presented in this article is just a small sampling of those available. When planning technology-based activities, it's essential to keep the focus on the desired outcome, and not on the tool itself. Though technology has greatly improved education, its presence in the classroom doesn't guarantee students are being challenged and thinking critically.

As an example, let's look at game-based quizzing tools like Kahoot. These tools are engaging and fun for students but often not used to promote higher order thinking. Usually, students are simply asked to recall basic facts and identify information. That's okay if the goal is to assess comprehension or review concepts. But if the goal is for students to synthesize information or apply new concepts, used in isolation, tools like this probably aren't a great choice. In favor of tools that are teacher driven and require passive student response, choose tools that put students in control. Technology that allows students to actively inquire, plan, and create best support the development of higher order thinking skills.

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