

# TEACHING THE 4CS WITH TECHNOLOGY

*How do I use 21st century tools  
to teach 21st century skills?*

Stephanie  
**SMITH BUDHAI**

Laura  
**MCLAUGHLIN TADDEI**

# TEACHING THE 4CS WITH TECHNOLOGY

---

*How do I use 21st century tools  
to teach 21st century skills?*

Building 21st Century Skills Through Technology .....	1
Critical Thinking: Interdisciplinary Inquiry-Based Learning .....	5
Communication: Videos, Wikis, Blogs, and Social Media .....	18
Collaboration: Teaming with Teachers and Partnering with Peers .....	27
Creativity: Encouraging Innovation and Invention .....	35
Encore .....	47
References .....	53
About the Authors .....	56

## Building 21st Century Skills Through Technology

The 4Cs—critical thinking, communication, collaboration, and creativity—are the basic skills all students need in the 21st century (National Education Association, 2014). Additionally, technology is constantly emerging around us, and expected to be part of every student’s learning experience. This book provides practical suggestions and ideas to leverage the use of technology to guide students toward thinking critically about what they are learning, building interpersonal communication skills, working more effectively with teams, and creating and innovating new ideas, concepts, and products.

We decided to write this book because we are striving to be 21st century educators who prepare our students to live and work in a global society. We have found through trial and error how technology creates environments where students can develop critical thinking, communication, collaboration, and creativity skills. Rosefsky Saavedra and Opfer (2012) urged:

... if we believe 21st century skills are the key to solving economic, civic, and global challenges and to engaging effectively in those spheres, then we must act upon the belief

that using those skills to overhaul our education systems is possible. (p. 12)

We know the impact and transformational experience technology brings, but it is important to look at the use of technology in the classroom by asking ourselves “What do we want students to learn?”, and after we have the objective, “How can technology transform the learning experience and foster the 4Cs?” Asking these questions in this way keeps the focus on *learning* and not on technology integration.

This book provides specific ways to meet the 4Cs through the use of technology. It is useful for teachers, teacher educators, instructional coaches, technology integration specialists, and undergraduate and graduate students. These generalized instructional best practices can be implemented in a variety of classroom settings, from preK through grade 12.

Each section includes suggestions to support best practices for each skill, examples of ways technology can be integrated, and practical tips and reflective questions to consider with teachers and administrators. The Encore section provides practical and relevant takeaways. We hope to collect stories from those who want to share their own integration of technology and how this connects to the 4Cs, so the Encore includes a link to a short survey where you can help us keep the conversation going.

We also provide specific ways to move from the substitution stage to the redefinition stage of technology integration, guided by the SAMR (Substitution-

Augmentation-Modification-Redefinition) framework. The SAMR framework serves as a support for teachers and administrators as they examine their use of technology (Puentedura, 2009).

There are four stages to the SAMR framework: Substitution-Augmentation-Modification-Redefinition. During the **substitution** stage, technology replaces a tool to carry out the same function, but it does not change the learning environment. For example, a washing machine is a technology tool that people substitute for washing clothes by hand. The hand and washing machine serve the same function; most people substitute the washing machine for their hands to make the process more efficient. In the school setting, students use word processing programs to draft academic writing, as opposed to pencil and paper. These are both technology integration at the substitution level.

The **augmentation** stage occurs when technology contributes to a change in the learning environment to improve the functionality of the learning experience. Allowing students to save their documents automatically to the cloud, as opposed to manually saving them, is an example of augmentation. The functionality of saving work has changed.

The **modification** stage leads to the integration of technology that causes a significant change in the learning environment and allows educators to redesign learning tasks in new and meaningful ways. This is the first step of using technology to alter learning tasks and experiences. Imagine that a history assignment called for students to create a timeline of the last century, highlighting one major event each

decade. Normally, students would present their work using a piece of paper and pencil by drawing the timeline and writing the events on the paper, or using a computer to type their timeline. An example of modifying this task with technology could include requiring students to create a virtual timeline using a multimedia application such as Timetoast. This task would also require them to embed a brief summary of the event in the timeline, which could be assessed by clicking the title as well as a function for peers to comment via the Internet.

The **redefinition** stage occurs when technology redefines learning and results in innovative teaching and learning environments that would not have been possible without the integration of technology. Learning activities at this level use multiple technology tools including the ability to work on projects and documents simultaneously with peers, collaborating with people around the world, and creating digital and tangible projects infused with technology.

Regardless of the SAMR level, the use of technology should be purposeful and enhance learning. Do not use technology because it is there. No matter how innovative technology may be, if it is not positively influencing learning goals, then it should not be used (Johnson, 2013). We mention many different tools and apps within our examples of technology integration, but the tool or app is not what determines the level of function; it is how this tool or app is used (Green, 2014). If someone chooses not to use the features of a particular app or tool, then the level of integration would remain at a basic level (Green, 2014). For this reason, many

of our suggestions can be used with a variety of tools and at a variety of SAMR levels.

The resources available in this text will help teachers

- Integrate technology into a wide range of subject areas and grade levels for all types of technology set-ups.
- Identify ways students can think critically, communicate with one another, collaborate as teams, and be creative with the use of technology.
- Provide suggestions of technology ideas along the SAMR ladder beyond substitution.
- Develop a toolkit of media and virtual website resources.

## Critical Thinking: Interdisciplinary Inquiry-Based Learning

*The important thing is not to stop questioning.*

—Albert Einstein

Critical thinking is at the crux of learning and developing 21st century skills. According to the Partnership for 21st Century Learning, while once reserved for gifted students, critical thinking and problem-solving skills are now important for all students to master (National Education Association, 2014). Critical thinking requires students to analyze, synthesize, and evaluate concepts and constructs presented