

## Chapter 9

# Collaboration via Technology as a Means for Social and Cognitive Development within the K–12 Classroom

**N. Leigh Boyd**  
Columbia University, USA

### ABSTRACT

*Collaboration within the K-12 classroom has been shown to benefit students' social and cognitive development. However, the results are not automatic, and there is some disagreement as to how to structure classroom collaboration to benefit students' development. Likewise, though technology seems nearly ubiquitous these days in the classroom, neither technology in general nor mobile technology specifically automatically offers benefits for students. This chapter will examine the research on collaboration and technology in the classroom, including Mercer's (2013) three products of collaboration (appropriation, co-construction, and transformation) and Stevenson and Hedburg's (2013) three interdependent elements of learning (task, environment, and experience). Finally, based on the research, a theoretical framework for understanding how best to set up mobile technology-enabled collaboration in the K-12 classroom is offered, including specific suggestions for curriculum planning.*

### INTRODUCTION

As a species, humans are primed to be social creatures (Mercer, 2013; Vass & Littleton, 2010). From the time we are babies, we seek out others. Infants nuzzling their caregivers and children playing games with other children lead into an adult world where negotiating social norms is expected and a key part of success.

Collaboration with others is not only an important part of adult work life, but it has become a major educational buzzword. The idea that cooperation can benefit students has taken hold, and few people argue against encouraging students to work collaboratively. As a life skill, working with others benefits

DOI: 10.4018/978-1-5225-0251-7.ch009

students as they move into the adult working world. Collaboration provides other benefits to students, as well, including both cognitive and social developmental gains.

But there is still debate on what works within collaboration, with both the mechanisms and conditions of cooperative learning under scrutiny. How, exactly, does collaboration accelerate both cognitive and social development? In what circumstances do children learn to grow in their understanding of themselves, the world, and the learning process? Though there have been gains made in answering these questions over the past decade and a half, these are still questions that researchers are exploring.

As with collaboration, understanding how to use technology is a major life and work skill for tomorrow's leaders (and, in many cases, today's leaders). Beyond the importance of technical knowledge for the real world, technology (particularly mobile technology) can have a major impact on the learning and growth of students. Research into educational technology goes back decades, but, even more so than research on collaboration, educators and psychologists are just beginning to understand some of what works with regards to utilizing technology in the classroom. Mobile technology in particular is a newer field that both holds great potential for educational impact and is still in the early days of research to find out what works, and how.

Mobile technology research is new enough, in fact, that there is still some variation in defining what mobile technology is. Some try to define mobile technology based on the mobility of the hardware (Cole & Stanton, 2003), while others specify that mobile technology is "lightweight, portable, and connect[s] to the internet" (Franklin, 2011, pg. 261). Still others focus on the communication aspect of mobile technology (e.g., Rau, Gao, & Wu, 2006), suggesting that any technology that allows for remote interaction is mobile, in that it allows remote users to communicate without having to be face-to-face.

For the purposes of this chapter, the definition of mobile technology focuses on two key elements: hardware mobility and remote interactivity. The first element focuses on the *mobile* in mobile technology: the technology must be able to be used in a variety of settings. In this way, phones and tablets are considered mobile technology, but so are laptop computers or other handheld devices. As long as the hardware is able to be utilized in many different locations or (in the case of software) able to be accessed via devices that can be utilized in many different locations, it is mobile.

The second element in my definition of mobile technology is remote interactivity, or the ability to allow interactions between different users who are not in the same physical space. Whether through texting, social media, or editing of a document, if users can communicate via the technology, it is interactionary. (The term "interactionary" is used here, in order to distinguish this element from "interactive," which simply requires that the user interact with the technology, and not necessarily another person.) This aspect of interaction between users follows from Rau, Gao, and Wu's (2006) view of mobile technology.

Some might take issue with this element of a mobile technology definition, but a fundamental aspect of mobile technologies today is to make possible the interaction between users. In fact, since the advent of the internet, both mobile and non-mobile technology have increasingly focused on interactivity. Gaming, email, Wikis, cloud sharing, and other mainstays of the technology age are all about users working within their own physical spaces, but in shared, communicative virtual spaces.

As mobile technology is interactionary, the use of mobile technology in educational spaces offers a unique ability for teachers to form a secondary, virtual space in which student-to-student and student-to-teacher interactions can continue outside the physical classroom. It is in this space in which the intersection of collaboration and mobile technology exists. But teachers often still have questions about how best to design this space and activities within it. The purpose of this chapter is to discuss

21 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/collaboration-via-technology-as-a-means-for-social-and-cognitive-development-within-the-k-12-classroom/157980](http://www.igi-global.com/chapter/collaboration-via-technology-as-a-means-for-social-and-cognitive-development-within-the-k-12-classroom/157980)

## Related Content

---

### Mobile Phones for People with Disabilities

H. Al-Khalifa and A. Al-Salman (2007). *Encyclopedia of Mobile Computing and Commerce* (pp. 569-575).  
[www.irma-international.org/chapter/mobile-phones-people-disabilities/17137](http://www.irma-international.org/chapter/mobile-phones-people-disabilities/17137)

### Survivability Enhancing Techniques for RFID Systems

Yanjun Zuo (2011). *International Journal of Handheld Computing Research* (pp. 25-40).  
[www.irma-international.org/article/survivability-enhancing-techniques-rfid-systems/51572](http://www.irma-international.org/article/survivability-enhancing-techniques-rfid-systems/51572)

### Smart Healthcare

R. Rajkumar (2018). *Contemporary Applications of Mobile Computing in Healthcare Settings* (pp. 21-33).  
[www.irma-international.org/chapter/smart-healthcare/204689](http://www.irma-international.org/chapter/smart-healthcare/204689)

### Design for Mobile Learning in Museums

Nikolaos Tselios, Ioanna Papadimitriou, Dimitrios Raptis, Nikoletta Yiannoutsou, Vassilis Komis and Nikolaos Avouris (2008). *Handbook of Research on User Interface Design and Evaluation for Mobile Technology* (pp. 253-269).  
[www.irma-international.org/chapter/design-mobile-learning-museums/21835](http://www.irma-international.org/chapter/design-mobile-learning-museums/21835)

### Wearables for Performance Support and Learning

Byron Havard and Megan Podsiad (2018). *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics* (pp. 37-50).  
[www.irma-international.org/article/wearables-for-performance-support-and-learning/235487](http://www.irma-international.org/article/wearables-for-performance-support-and-learning/235487)