

## Chapter 29

# The Use of Tablet Technology to Support Inquiry Science for Students Incarcerated in Juvenile Justice Settings

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### ABSTRACT

*This chapter describes the challenges in implementing science instruction in juvenile corrections settings and present a tablet-based model for meeting the complex challenges. Project RAISE is a Project-based Inquiry Science (PBIS) curriculum designed in the Universal Design for Learning framework. It is developed in a tablet platform, and is designed to meet the unique needs of incarcerated learners. The chapter describes the juvenile justice educational setting, the characteristics of the classrooms, the learners, and the teachers. It provides an overview of one iBook that has been co-designed and tested with incarcerated learners.*

## INTRODUCTION

There is a dearth of research examining science instruction in juvenile corrections settings. However, the limited evidence of education in these settings reveals substandard instructional practices and low percentage of highly qualified teachers (Krezmien, 2008). In juvenile justice education, even the potential for high-quality science instruction is limited by a general overreliance on independent worksheet completion, the consequential lack of content-specific skill instruction, and the delimited ability of educators working outside their subject area to support student science learning. Furthermore, most juvenile corrections settings are operated from a safety and security perspective that does not allow laboratory opportunities or the use of equipment or materials for classroom experiments. Finally, because the students are confined in a secure placement because of infractions of the law, students cannot leave the facility to do field based experiments that would be particularly powerful in Biological Science classes. In this chapter, we illustrate how tablet-based technology can be utilized to circumvent some of these issues and develop content knowledge, inquiry skills, and increased interest and engagement in science among a group of incarcerated youth.

The work described in this chapter is part of a National Science Foundation (NSF) funded research project (DRL-1418152) titled *Reclaiming Access to Inquiry-based Science Education (RAISE) for Incarcerated Students: An Investigation of Project-Based Inquiry Science within a Universal Design for Learning (UDL) Framework in Juvenile Corrections Settings*. Project RAISE is a design and development project that focuses on developing, implementing and researching a Project-Based Inquiry Science (PBIS) curriculum within a Universal Design for Learning (UDL) framework. We worked collaboratively with the administrators, teachers, and students in a juvenile justice agency in all stages of the curriculum development, an approach that has been identified as a strategy for creating knowledge that is more relevant to classroom practice than the knowledge generated by research institutes (Enthoven & de Bruijn, 2010). The ongoing feedback from the critical stakeholders in our juvenile justice settings was used to revise all piloted components of the curriculum and thus informed the development of all instructional components.

The Project RAISE curriculum is delivered digitally through a tablet platform that replaces textbooks, workbooks, worksheets, and paper assessments, while at the same time integrating text-based content with multiple media (e.g., pictures, videos, animations, and interactive diagrams). The curriculum is tailored to the full range of learning needs in a diverse population of learners, provides real-time feedback to students and teachers, and enables students to participate in virtual inquiry experiences unavailable in typical juvenile corrections settings. Furthermore, our curriculum engages incarcerated youth in scientific practices that support scientific thinking, which is critical to preparing students with the 21<sup>st</sup> century skills that enhance their college and career readiness as outlined by the Committee on Defining Deeper Learning and 21<sup>st</sup> Century Skills (NRC, 2012). Educators have a duty to prepare students incarcerated in juvenile justice settings to become scientific thinkers. The scientific mindset aligns with the knowledge and skills necessary to integrate thoughtfully back into society and to become active, critical and engaged members of a rapidly transforming world.

In this chapter, we will show science education researchers and policy makers and other professionals how to utilize technology while forming partnerships with stakeholders with the ultimate aim of developing student inquiry skills and an engagement in science, even in a setting as constrained as juvenile corrections. Through a technology-based curriculum, we engaged incarcerated students in interactive instructional experiences that delivered complex science content, all within a UDL framework that ad-

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