# Chapter 17
# Implementing a Measurement Framework to Assess and Evaluate Student Readiness for Online Learning and Growth

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## ABSTRACT

*This chapter was developed out of a study on the effectiveness of an online technology mini-course to prepare students for success in online classes. The work focuses on the methodology used to measure student readiness to engage with technology, and to measure growth in student technical knowledge as a result of the mini-course. The researchers applied Rasch analysis for both of these purposes, creating measurement scales from brief surveys. This chapter describes the results of the study, providing a step-by-step description of how to develop a similar scale for use in the classroom, and how to interpret results of Rasch analysis to gain valuable insight into student understanding of technology.*

## INTRODUCTION

As educational institutions increasingly provide online courses, it is important to recognize that many students face a steep learning curve with technology. The challenge of any course should be limited to the material and not confounded by the mode of delivery.

A team of researchers at the University of Kentucky embedded an Introduction to Online Learning (Arrowsmith, 2017) mini-course into a core class in an online program (Sampson, Bradley, Arrowsmith & Mensah, 2016). The Introduction to Online Learning course is designed to provide students with hands-on practice using the assignment, testing, and communication tools in the Learning Management

DOI: 10.4018/978-1-5225-2953-8.ch017

System (LMS) through which the online class is delivered. The introductory course guides students through technology and computer issues that are often debilitating on the first days of class. By providing the students with a guided opportunity to use online course tools in a practice environment prior to their first for-credit course, this mini-course is designed to increase students' likelihood of succeeding in online coursework.

Before considering the use of a mini-course, teachers are wise to recognize that students bring varying amounts of background to the table. Some students are well prepared to engage with online content and do not need a tutorial, while others need a great deal of support to be able to succeed in an online environment. Gauging the readiness to engage with online content is an important first step.

In this chapter, we outline a framework for measuring readiness for technology, and for measuring growth in student technical knowledge, using Rasch analysis. We describe the Sampson, Bradley, Arrowsmith and Mensah (2016) study, beginning with a measure of student technical knowledge, then a look at growth in technical knowledge as a result of the mini-course designed by Arrowsmith (2017). We then outline an investigation of student comfort with various technology applications, measured with a brief Likert-type survey. Using Rasch analysis, we transformed the survey data into a "Technology Comfort" scale, to gauge student readiness for technology. In the description of the results of the study, we provide a step-by-step description of how to develop a similar scale for use in any classroom, and how to interpret results of Rasch analysis to gain valuable insight into student understanding. Thus, we present a framework for any institution or individual attempting to improve the online student's experience.

## BACKGROUND

Over the past two decades, the evolution of educational technology and its impact on K-12 education has been monumental. In the age of accountability, being able to measure such impacts is not only expected, it is necessary. The call for empirical data-driven evidence has created classrooms conditioned to measuring. Standardized testing results continue to be a driving force in our K-12 classrooms, enforced by federal legislation and pressures from all levels of administration and the community at large. Today's teachers are in the habit of collecting data and using this information to make decisions. Pre-assessments, formative feedback, growth of learning, classroom assessments, and standardized tests are all part of the normal classroom routine. Parents and even the larger community have become accustomed to reports and assessment results indicating how students are performing. Classroom teachers utilize data to inform their instruction, make decisions about placement, and critique their own delivery. The documentation of this culture has been around for years (Erpenbach, W. J., & Forte, E., 2007; Ballard, K., & Bates, A., 2008).

As many educators transition their classroom instruction from the traditional face-to-face setting to an online environment, measuring student readiness to engage with technology is increasingly important. Given the permeating presence of accountability in education in the United States and beyond, the responsibility to understand such processes and outcomes cannot be avoided. Student readiness is related to foundational strengths, background knowledge, and also gaps in preparedness. Measurement already plays a prominent role in the classroom. Teachers utilize measures to determine whether their instruction or other educational experiences have produced desired goals and if criteria are met. Illustrating a better informed use of tools provides a more reliable, valid, and responsible approach to assessing and evaluating student ability, understanding, and readiness to engage with new concepts.