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MARZANO STUDY

A Study of Best Practices in Edmentum Online Solutions

An analysis and interpretation of a Marzano Research Laboratory study

2016

Marzano Research Laboratory

Our Mission
To provide the best research, the most useful actions, and the highest level of services to educators.

Our Vision
To continuously develop tools that translate high quality educational research into practical applications educators can put to immediate use.

Our Goal
To be the place educators go for the latest information and data, synthesized into clear, concise resources that facilitate immediate action.

Overview

In traditional classrooms, educators and students arrive with a certain set of expectations, shaped largely by past experiences. Although students may need occasional reminders of what is required of them, this educational setting is familiar to both students and teachers. In addition, decades of research has explored classroom practices related to student achievement and identified instructional strategies that show positive, measurable effects on student achievement in a traditional classroom setting (Hattie, 1992; Marzano, 1998; Wenglinsky, 2002; Marzano, 2003). Teacher-level variables associated with raising the academic achievement of students are commonly grouped into three categories: instruction, classroom management, and curriculum design (Marzano, 2000).

In contrast to the considerable research into instructional strategies used in a traditional classroom setting, there is a dearth of literature that examines the effect of instructional strategies on student academic outcomes in an online learning environment. While comprehensive standards for online teaching—such as the International Association for K-12 Online Learning's (iNACOL) 2011 Quality Standards for Online Teaching—have been established, existing frameworks for online instruction are not based on research that has specifically addressed the effectiveness or impact of these guidelines on student achievement.

To address this void, Edmentum contracted with Marzano Research Laboratory (MRL), an education firm led by Dr. Robert Marzano that seeks "to continuously develop tools that translate high-quality education research into practical applications educators can put to use," to evaluate the relationship between student learning and effective teacher pedagogical practices with respect to the use of online instructional solutions. Using the Marzano Instructional Model (The Art and Science of Teaching, Marzano, 2007) as the framework, this study sought to identify effective instructional practices in the online learning environment. The full report–Best Teaching Practices in Online Learning–is available at www.edmentum.com. Results from the study are summarized below. Please refer to the full study report for additional detail on the study design, participants, analyses, and complete results.

Summary of Results

The Marzano Observation Protocol is structured around ten instructional design dimensions representing three categories of teacher behavior, practices, and strategies that are commonly observed during instruction and that have been found to positively impact student achievement. Table 1 below details instructional strategies and behaviors implemented by teachers in the study sample that were found to be significantly related to higher levels of student achievement in an online learning environment.

Table 1. Teacher practices positively impacting student achievement in the online environment
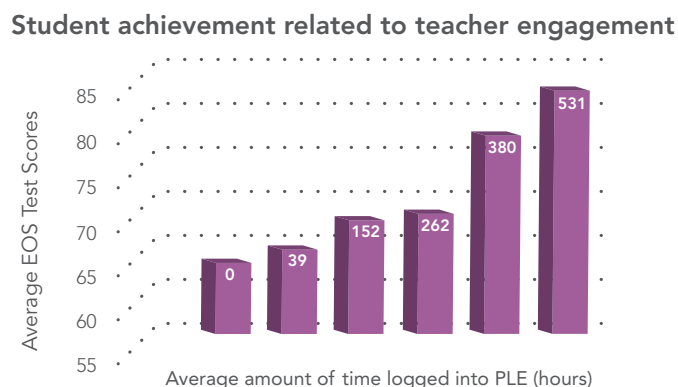
Teacher practices positively impacting student achievement in the online environments
• Persistent, active engagement in the online learning environment
- Total time spent logged into the Plato Learning environment (PLE)
- Number of times logged into PLE
- Average amount of time logged into PLE

Marzano Dimension: Strategies involving routine events
• Communicating course/assignment rules and procedures
• Providing students with all materials needed to complete an assignment
• Clearly presenting the goal/objective for each assignment
• Offering encouragement and positive feedback to students
• Allowing students to keep track of their learning progress
•Accessibility to students via electronic communication as well as face-to-face
Marzano Dimension: Strategies enacted on the spot
• Monitoring student work
• Knowing every student by name and being able to recognize them outside of the online environment
• Allowing students to progress through assignments at their own pace
• Providing help to understand and practice new knowledge
• Allowing students to ask questions during online course/assignment
• Treating all students equally
Marzano Dimension: Strategies addressing content
• Adding external resources to assignments aligned to local objectives

Analysis

In the past, the process of learning was often viewed as a largely passive experience in which knowledge is received and stored for future use. Over the past 20 years, however, cognitive research has led to theories and paradigms that reflect a more active model of knowledge acquisition. Similarly, one of the criticisms levied against online learning has been that with the teacher removed from the direct instruction, the role of the educator is transformed into that of a passive observer. Results from this study provide resounding evidence to the contrary, as teacher engagement in the online learning process was found to have the strongest relationship to student achievement outcomes.

Figure 1. Illustrates the relationship between student achievement and teacher engagement in the Plato Learning Environment (PLE).

Student achievement related to teacher engagement

Average EOS Test Scores — 0, 39, 152, 262, 380, 531

Average amount of time logged into PLE (hours)

Across all categories of teaching strategies, teachers reported frequent engagement of instructional behaviors and practices that have been found to positively impact learner outcomes up to 99% of the time. Student perceptions of teaching strategies corroborated the self-reported practices of teachers, reporting that teachers frequently implement effective instructional strategies using Plato Courseware up to 88% of the time. Regardless of instructional setting (pure virtual, blended, classroom/lab) or course purpose, teachers consistently and frequently implement effective instructional strategies.

Interpretation

The instructional strategies listed in Table 1 are those that were observed to significantly impact student achievement. Simply stated, teachers who implemented those strategies and engaged in those behaviors in the online learning environment more frequently saw their students achieve at higher levels. That is not to say that additional instructional strategies are not effective or necessary, but the teaching practices listed in Table 1 are best practices relative to impacting student learning.

Table 2 provides strategies for implementing the best online teaching practices that impact student learning.

Table 2. Strategies for implementing best online teaching practices

Best Practice: Communicating course/assignment rules and procedures
Strategies
• Provide clear course policies and procedures at the beginning of the course/assignment.
• Provide clear information about the timeline for the course, including all assignments, assessments, and course activities.
• Provide clear information about methods of instructor-to-student communication and about all student course support resources.
• Ensure that all students have directions, resources, and a working understanding of how to navigate and successfully operate all student systems within the online learning environment prior to engagement with the course content.
Best Practice: Clearly presenting the goal/objective for each assignment
Strategies
Provide or reinforce clearly stated course goals and learning objectives for each major concept within the course.
Best Practice: Providing students with all materials needed to complete an assignment
Strategies
• Provide multiple learning resources with engaging and meaningful learning activities.
• Provide clear and complete instructions (how to proceed, assignment requirements, and assessment expectations) with rubrics for all activities.
• Provide information about student course support resources.
Best Practice: Offering encouragement and positive feedback to students
Strategies
• Begin interacting with students early in a course to affirm each student's successful participation.
• Provide timely, supportive, individualized, and frequent feedback on student progress that emphasizes the intended learning outcome.
• Analyze a student's mastery level of standards content and provide additional instruction to help the student meet mastery level.

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Best Practice: Allowing students to keep track of their learning progress
Strategies
• Provide resources that allow students to self-monitor their academic progress throughout the course.
• Provide timely and meaningful feedback on assignments, assessments, and related course learning activities, allowing students to be continuously aware of their progress in the course.

Best Practice: Accessibility to students via electronic communication as well as face-to-face
Strategies
Facilitate meaningful and timely communications (electronically and face-to-face).

Best Practice: Monitoring student work
Strategies
• Closely monitor individual student data to guide instruction and provide intervention activities for unsuccessful learners.
• Identify and monitor course assessments that correlate to state high-stakes tests to assure mastery of those key concepts and provide additional learning experiences when needed.

Best Practice: Knowing every student by name and being able to recognize them outside of the online environment
Strategies
• Communicate with each student prior to, or early in, a course to answer any questions and to build a supportive instructor-to-student relationship.
• Provide a supportive and engaging learning community environment for all students.

Best Practice: Allowing students to progress through assignments at their own pace
Strategies
• Ensure that the curriculum is at the correct level for students and has appropriate rigor.
• Provide multiple learning pathways based on student ability to achieve content mastery.
• Provide ample assessment styles throughout the course to monitor student mastery of content and provide remedial instruction when needed.

Best Practice: Providing help to understand and practice new knowledge
Strategies
• Provide synchronous learning activities in large and small learning groups to support key concepts within the course content.
• Provide multiple opportunities for students to be actively engaged in content that includes meaningful and authentic learning experiences, such as collaborative learning groups, student-led review sessions, instructional games, analyses, discussions, case studies, etc.
• Provide a wide range of activities, assignments, assessments, and resources to allow students to demonstrate mastery of content.
• Provide high-level thinking and critical reasoning activities in increasing complexity throughout a course.

Best Practice: Allowing students to ask questions during online course/assignment
Strategies
• Foster teacher-student and student-to-student interaction.
• Ensure students have accessibility through various communication methods.

Best Practice: Treating all students equally
Strategies
• Provide multiple learning resources with engaging and meaningful learning activities to all students.

Best Practice: Adding external resources to assignments aligned to local objectives
Strategies
• Adapt the course content to meet students' needs by providing additional assignments, resources, and activities for remediation or enrichment during the course experience.
• Assure that course content, assignments, and assessments are of appropriate rigor and align to state standards.
• Augment, as needed, course content, learning activities, and assessments to meet all required standards within a course.

Implementation of these instructional practices and strategies in the online learning environment is associated with higher levels of student achievement. Teachers who use the features and characteristics of Plato Courseware and the Plato Learning Environment frequently engage in instructional strategies that have been found to positively impact student academic outcomes. The study found that teacher engagement—as measured by the number of times teachers logged into Plato and the amount of time spent in the system—was the strongest predictor of higher levels of student achievement. Said another way, student learning in the online environment increases when teachers are actively involved and engaged in the process. The Plato Learning Environment provides teachers with tools and features that have significant, positive effects on increased levels of student learning. The more educators engage with Plato Courseware, the more students benefit.

Summary of Study Design

The study examined perceptions of instructional practices and achievement data from 1,828 students and 141 teachers at 23 sites in 12 states (California, Florida, Iowa, Illinois, Indiana, Massachusetts, Maine, New Hampshire, New York, Ohio, Oklahoma, and Pennsylvania), looking specifically at Edmentum's online solutions in three instructional settings (pure virtual, blended, and classroom/lab) across four purposes (original credit, credit recovery, intervention, and Advanced Placement). MRL adapted the Marzano Observation Protocol, a comprehensive framework for effective instruction, into student and teacher surveys that measured perceptions of instruction and administered the surveys to the study participants. In addition, student achievement data was collected to analyze the relationship between teacher practices and learner outcomes.

The Marzano Observation Protocol is structured around ten instructional design questions representing three categories of teacher behavior, practices, and strategies (referred to as "lesson segments") that are commonly observed during instruction and that have been found to significantly impact student achievement. Here are the three categories:

1. Strategies involving routine events:

  • What do teachers do to establish and communicate learning goals, track student progress, and celebrate success?

  • What do teachers do to establish or maintain classroom rules and procedures?

2. Strategies enacted on the spot:

  • What do teachers do to engage students?

  • What do teachers do to establish or maintain classroom rules and procedures?

  • What do teachers do to recognize and acknowledge adherence and lack of adherence to classroom rules and procedures?

  • What do teachers do to establish and maintain effective relationships with students?

  • What do teachers do to communicate high expectations for all students?

3. Strategies addressing content:

  • What do teachers do to help students effectively interact with new knowledge?

  • What do teachers do to help students practice and deepen their understanding of new knowledge?

  • What do teachers do to help students generate and test hypotheses about new knowledge?

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