

McGraw-Hill Connect® Effectiveness Study

Evaluating the all-digital course management platform's impact on professors' instructional efficacy and students' academic performance at 18 U.S. higher education institutions

Introduction:

Faculty and administration at higher education institutions have long understood the need to engage students in their coursework inside and outside of lecture halls because of the multiple benefits that student engagement brings. Instructors want students to fully understand the course material; come to class well prepared, ready to learn *and* discuss more advanced topics of study; improve their academic performance and, in turn, increase their long-term retention at the institution and their ability to succeed post-graduation. In today's digital era, engagement necessarily means connecting students, faculty and the coursework in a digitally interactive, real-time, full-circle way that extends beyond the physical and virtual classrooms.

The solution? McGraw-Hill Connect®.

Connect is an industry-leading, web-based assignment and assessment platform. It uses the latest digital technology and adaptive learning techniques to better connect professors to their students, and students to their course materials (everything from the e-textbook to the syllabus) in a single, convenient, easy-to-use online site. In courses ranging from Accounting and Chemistry to Biology and Psychology, the customizable Connect platform allows instructors to give homework assignments which the platform subsequently grades immediately and automatically, upload recorded class lectures and presentations, highlight important sections of, and add notes to, the course e-book, as well as track student progress and concept comprehension.

Scope of Study:

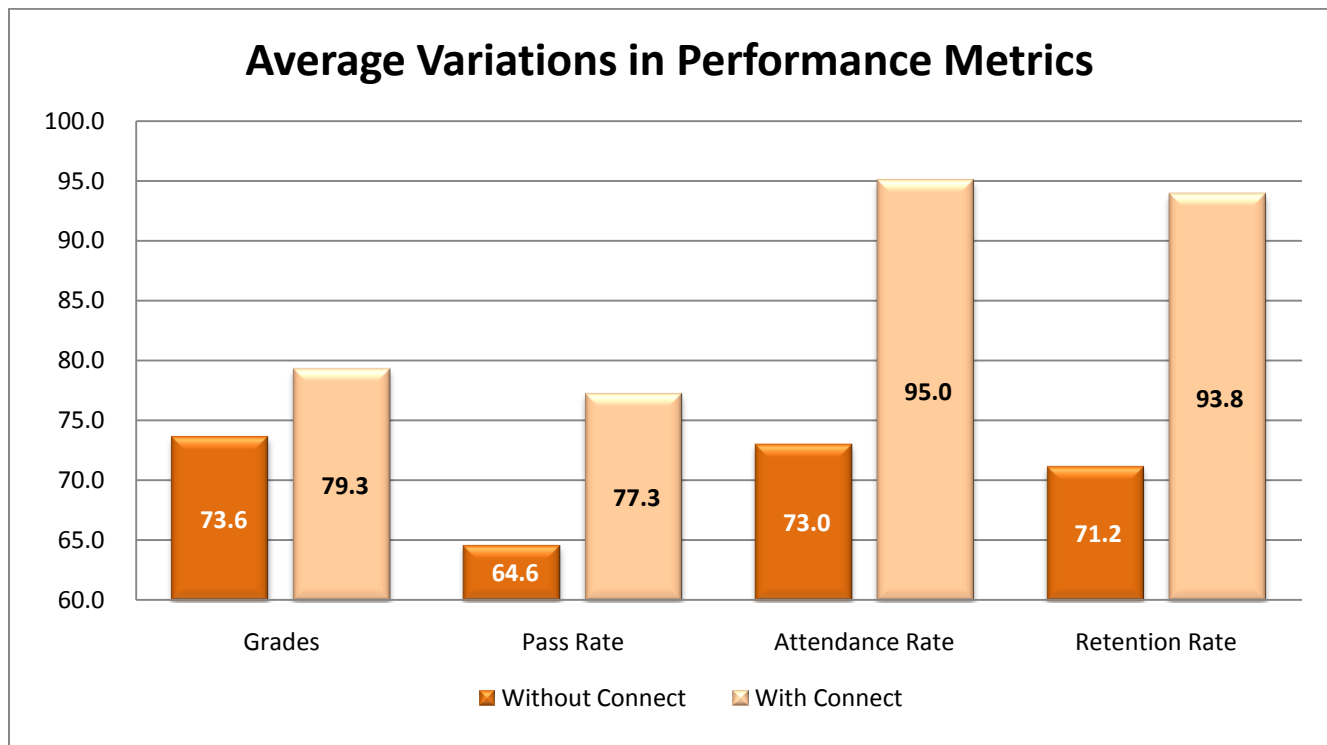
Digital teaching and learning platforms, like McGraw-Hill's Connect, are being implemented to increase teaching and learning effectiveness in thousands of colleges and universities throughout the country. In order to determine Connect's effectiveness in these areas, data were aggregated and analyzed from 18 case studies featuring diverse colleges and universities in the United States. The resulting analysis outlines the benefits of Connect and highlights how instructors and students alike have experienced improvements in grades and class averages, student engagement, time management, in-class discussions and lectures, and overall satisfaction with the course and coursework.

Summation of Findings:

Throughout this analysis four major areas of improvement were consistently identified:

1. Reduction in administrative time for instructors;
2. Increase in effectiveness of lectures and engagement of students;
3. Rise in student confidence and retention rates; and
4. Improvement in test scores and overall grades.

In fact, in all 18 case studies, instructors reported that using Connect improved students' overall performance. This was exemplified through increased engagement, improvement in test scores and course grades, attendance, and/or retention rates. A majority of the case studies showed an average grade increase of more than five points, often equal to half a letter grade. In addition, several of the studies highlighted an average increase of student retention rates by nearly 23% (see graph below).



The above graph illustrates the average performance metrics with and without the implementation of Connect, compiled from the aggregated data of the case studies.¹

“My time spent grading has decreased, leaving me more time for research and finding current events and practical application examples to incorporate into class. Students like Connect because it assists them in preparing for tests. They also like the interactive nature of the assignments and the fast response for grading. I’ve noticed a 3 to 5 point increase in the average of test grades since using Connect.”

—Professor John Striebich, Monroe Community College

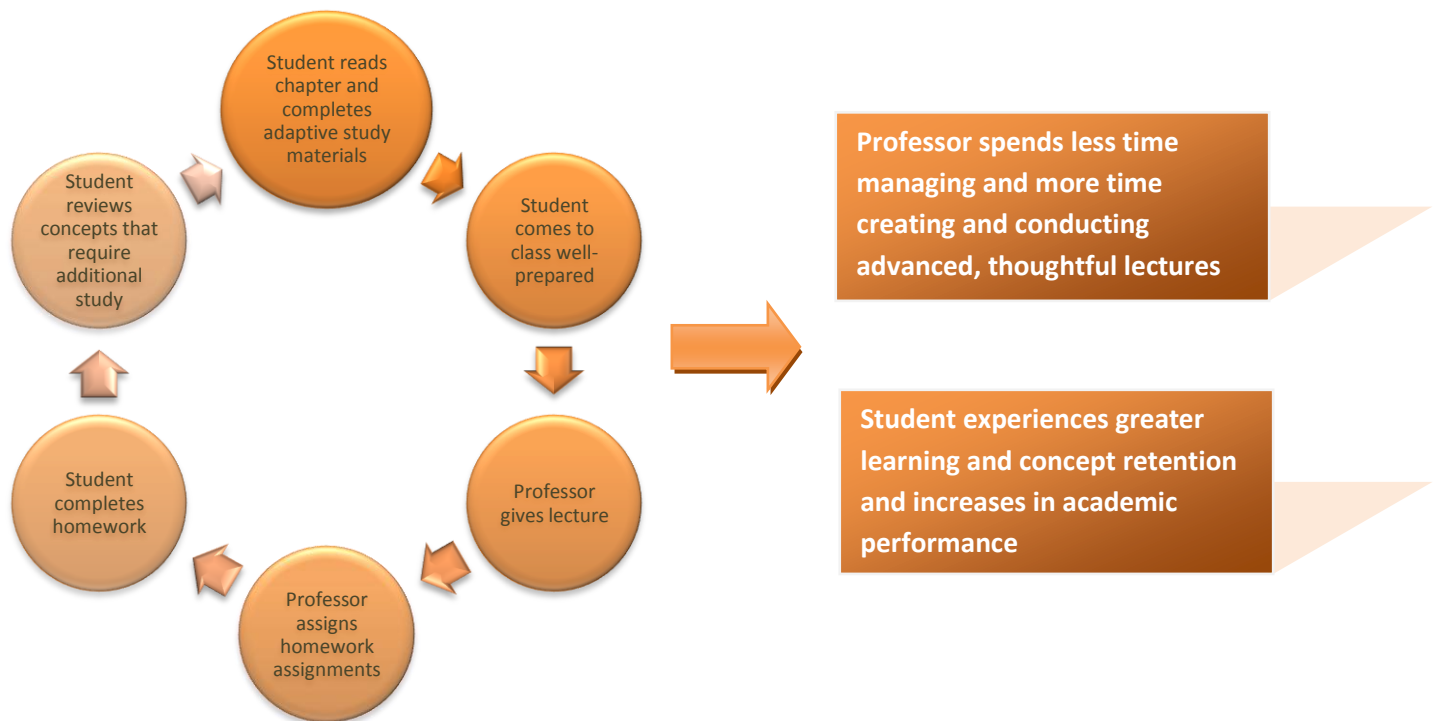
¹ The “Without Connect” average score (\bar{S}) represents the average of all the scores obtained by control groups across the various case studies for a given homogenous metric (p_n) (grades, pass rate, retention rate, or attendance rate). “With Connect” average score (\bar{S}') represents the average of all scores obtained by test groups (p'_n). The “average variation” (Δ) is the difference between the average scores of test and control groups: Without Connect average score: $\bar{S} = \bar{x}(p_1, p_2, \dots, p_n)$; With Connect average score: $\bar{S}' = \bar{x}(p'_1, p'_2, \dots, p'_n)$; Average Variation: $\Delta_{(\bar{S}, \bar{S}')} = \bar{S}' - \bar{S}$. Whereas, **Grades**: based on 30 control/test groups from 9 institutions of higher education; **Pass Rates**: based on 8 control/test groups from 5 institutions of higher education; **Retention Rates**: based on 6 control/test groups from 4 institutions of higher education; **Attendance Rates**: based on 2 control/test groups from 2 institutions of higher education.

Embracing Technology to Achieve Results

According to the National Center for Educational Statistics only 36.4% of the first-time postsecondary students who started as full-time students in 2002 completed their bachelor degree within four years; 52.3% completed the degree in five years.² With nearly half the students who entered a college or university seeking a degree not obtaining one in five years time, it begs the question – How can higher education institutions further support students throughout the learning process in order to raise graduation rates?

How Connect Benefits Instructors

Overall, Connect allows instructors to be more efficient and effective both in and out of the classroom. Connect guides students through the course material which ultimately helps them come to class well prepared and ready to engage in thoughtful discussions for more meaningful and higher level learning. Once the course outline and coinciding materials have been created using the Connect platform, time spent refining and grading class assignments and tests is reduced to a fraction. Connect also gives instructors the ability to track their students' progress and concept comprehension throughout the semester, allowing them to adapt lectures accordingly and provide additional support to those students who exhibit greater need. With Connect, instructors no longer lose valuable lecture time to the extensive review of homework or the administration of quizzes and in many cases even tests.



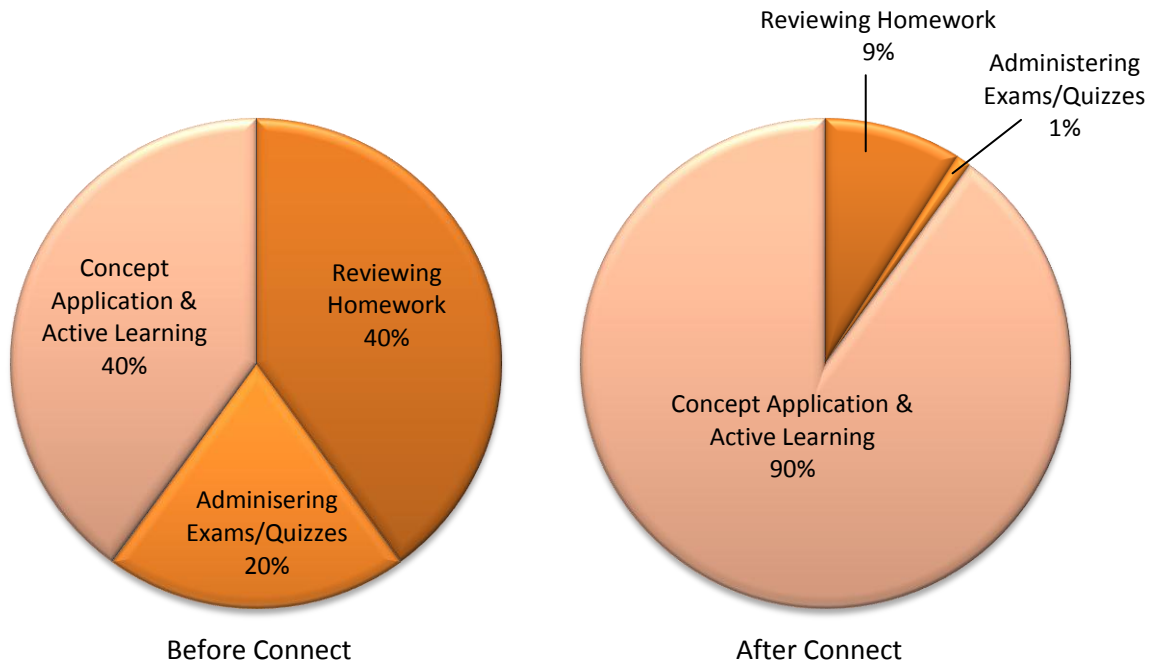
² National Center for Education Statistics, table prepared July 2010:
http://nces.ed.gov/programs/digest/d10/tables/dt10_341.asp. Website accessed: July 1, 2011.

Reducing Administrative Time

Because Connect automatically grades students’ assignments, providing students with immediate feedback, instructors are no longer burdened by these administrative tasks, and can focus almost exclusively on teaching. Over half the case studies highlight the marked reduction in time spent grading.³ Instructors use this additional time preparing and refining lessons, spending one-on-one time with students, covering more key concepts and critical material in class, and bringing in current, real-time events and topics.

Dr. David Welch, D.B.A., CPA, CFE of Franklin University in Columbus, Ohio has recovered the equivalent of two weeks of lecture time by having his students complete tests outside of class using Connect. This allows Dr. Welch to spend significantly more time teaching new concepts and required course material versus administering tests and reviewing homework assignments. In fact, his time spent teaching key concepts has more than doubled since using Connect. “Connect has been the best learning tool we could offer our students. Their success rates and improved impression of the course have made their lives and mine much easier,” said Dr. Welch.⁴

Dr. Welch of Franklin University recovered the equivalent of two weeks of lecture time by having his students complete tests outside of class using Connect.



The above graph illustrates Dr. Welch’s change in lecture time distribution with and without Connect.⁵

³ Et al. Digital Course Solution Improves Student Success and Increases Instructor Efficiency, Case Studies

⁴ Welch, D. Case Study, Franklin University, Fall 2010.

⁵ Welch, D. Case Study, Franklin University, Fall 2010.

Similarly, Dr. Lois Bitner Olson, Ph.D. of San Diego State University in San Diego, California has been able to reduce the amount of time she spends on assignment preparation and grading by more than 88% - from 4.5 hours per week to just 30 minutes. All of the time recovered allows Dr. Olsen to devote more attention to her lectures and redesign them based on students' skill level.⁶

Additionally, many instructors are impressed by Connect's ease of use which only further enhances its time-saving capabilities. Dr. Jason Overby, Ph.D. of College of Charleston in Charleston, South Carolina believes the accessibility and simplicity of the Connect platform distinguishes it from other course management systems. Dr. Overby finds the platform both intuitive and engaging. "Technology should never be a barrier to learning and with Connect it's not," said Dr. Overby. "I don't know how Connect could be any simpler to use."⁷

Creating More Effective Lectures

While instructors no longer need to grade assignments, they can still track their students' comprehension and progress both individually and collectively. Connect's robust reporting functionality allows instructors to see which concepts their students have mastered and where they lack understanding and/or confidence. This enables instructors to adjust lecture content accordingly in order to be more efficacious in class.

"Connect has changed the way that I lecture because I see real-time data and feedback. This allows me to adapt my lectures to suit my students' needs."

—Dr. Jason Overby,
College of Charleston

Dr. Frank Wray, Ph.D. of University of Cincinnati in Cincinnati, Ohio, is able to effectually assess student academic performance through Connect using reports such as the item analysis, assignment statistics, and student performance to identify areas of strengths and weaknesses at both the class and individual student level. "I am much better able to assess whether students are actually learning something," said Dr. Wray. "The reporting function made my colleagues and me much more efficient and has armed us with valuable data to help students master the material." Dr. Wray also noted that as his students' assignment completion rate increased, their mastery of concepts also improved.⁸

Dr. Sam Mirmirani, Ph.D. of Bryant University in Smithfield, Rhode Island also appreciates the ability to more carefully craft his lecture time to focus on key topics, making them more applicable to his students' level of comprehension. The reports within Connect show him the topics that his students need the most help with, so he is able to update his lecture notes based on the report feedback. "I now have more frequent and systematic information on how my students are doing," said Dr. Mirmirani. "Through the detailed reporting on class performance I now know which areas to emphasize more and which ones less."⁹

⁶ Olson, L.B. Case Study, San Diego State University, Spring 2010.

⁷ Interview with Jason Overby, June 27, 2011.

⁸ Wray, F. Case Study, Fall 2009.

⁹ Mirmirani, S. Case Study, Spring 2010.

“Connect is an invaluable support tool for me because I know my students are thinking about class even when they aren’t there. They review the information we covered in class on their own time, and are able to easily access a broad range of study tools while they complete homework assignments.”

—Sheryl Hadley, Dept. Chair,
Johnson County Community
College

Not only does Connect empower instructors to craft more meaningful lectures based on data, it also helps students fully engage in the course material thus allowing them to come to class better prepared. Dr. Joy Berrenberg, Ph.D. of University of Colorado – Denver in Denver, Colorado has discovered that once her students began using Connect they became more engaged with the coursework. She feels it is a highly innovative and effective way to raise students’ participation both in and out of the classroom. “Students ask more interesting questions and we’re able to have more thoughtful discussions in class,” said Dr. Berrenberg. “Because of their use of Connect the students already grasp the most basic principles before setting foot in the

classroom.” Lectures and class time thus become more meaningful and engaging for both the students and instructors.¹⁰

How Connect Benefits Students

Connect offers students a variety of features and tools in order to support and aid them throughout the learning process. Connect acts as a virtual study partner through adaptive learning tools such as LearnSmart that provide students with individualized instruction while giving them access to recorded class lectures through Tegrity and a fully interactive McGraw-Hill e-book. Connect allows students to learn at their own pace and on their own schedule. It’s easy to see why so many students using Connect feel more confident with class material and have improved their grades. In fact, 16 of the 18 case studies highlighted a marked improvement in students’ overall grades and test scores.

“Students like the flexibility that Connect offers. It has made a major difference in the student athletes’ participation and performance. They can complete their work and catch up on lectures anytime and anywhere.”

—Professor Lisa McKinney,
McKinney, M.T.A., CPA,
University of Alabama

“As a student I need to interact with course material in order to retain it, and Connect offers a perfect platform for this kind of learning. Rather than just reading through textbooks, Connect has given me the tools to feel engaged in the learning process.”

—Jennah Epstein Kraus,
Student, Bunker Hill
Community College

Increasing Students’ Confidence and Retention

Learning new concepts can be challenging and when students are uncertain in their work, it can inhibit full participation in class and limit their learning potential. Professor Meg Pollard, M.B.A. of American River College in Sacramento, California, reports that Connect has ultimately increased her students’ confidence. She believes that students find her accounting class less intimidating when using Connect. Because Connect gives students immediate feedback on their work, student confidence increases with each correct answer. “Connect provides students with meaningful practice opportunities and the accompanying feedback to close the loop of learning,” said Professor Pollard. “Students often struggle

¹⁰ Berrenberg, J. Case Study, Spring 2010 and Fall 2010

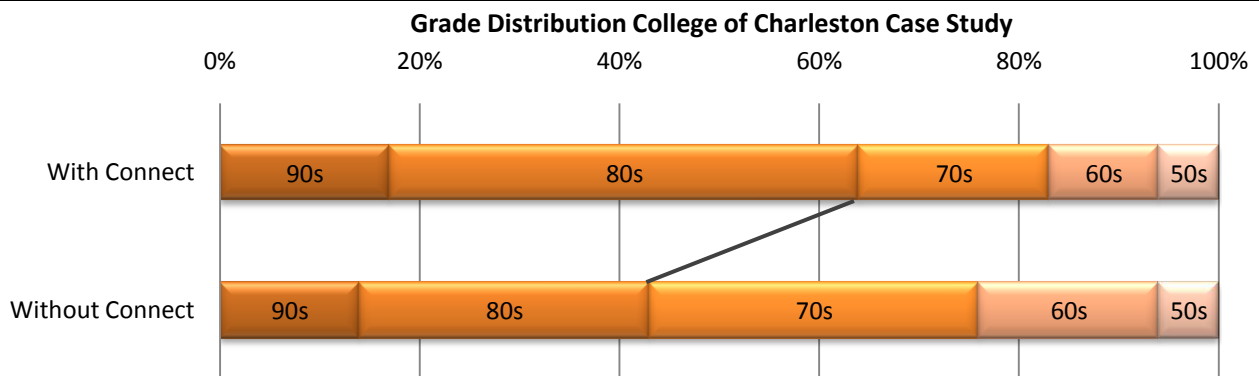
with concerns about how to get started with their homework and whether their work is correct. Connect offers a structure that allows them to engage with assignments and work with confidence.”¹¹

Greater confidence in course material coupled with access to a variety of learning tools, such as LearnSmart and Tegrity lecture capture, has proven to increase student retention rates. Dr. William L. Hoover II, M.D. of Bunker Hill Community College in Boston, Massachusetts, observed a drastic improvement in the retention rates of his anatomy and physiology courses after integrating Connect into his classes. He reports that for the five years prior to his implementation of Connect, 17% to 20% of all students enrolled in his anatomy and physiology courses dropped the class, for a retention rate of about 80%. Since the fall of 2009, his retention rate has increased to an average of 90-92%, with some semesters 100% of students staying in the course.¹²

Improving Students’ Grades

By creating a platform that builds student confidence, engagement, and retention, the end result is a more connected student, often producing a higher scoring student. Dr. Overby of College of Charleston saw a significant shift in grade distribution once Connect was utilized in his course. Connect provides his students with a platform to interact with the course material on a daily basis. Dr. Overby also made note of the quality content that Connect implements, highlighting that one of the “hallmarks” of Connect is the development of content and lessons by instructors who are in the classroom today.¹³ Through this increased engagement nearly 60% of students receive As and Bs compared to the 43% from previous semesters that did not use Connect. “Overall the class average in this course tends to be fairly clustered around 75%, but since implementing Connect, I have seen a significant improvement in the class average on exams,” said Dr. Overby.¹⁴

“I feel that I learned the material in the course quicker, retained the information longer, and felt better prepared for unit exams because of the Connect system.”
 –Robert L. Jones, Student,
 Johnson County
 Community College



The above graph illustrates the grade distribution of Dr. Overby’s classes with and without the implementation of Connect.¹⁵

¹¹ Pollard, M. Case Study, Spring 2011.
¹² Hoover II, W. L. Case Study, Fall 2009 and Spring 2010
¹³ Interview with Jason Overby, June 27, 2011.
¹⁴ Overby, J. Case Study, Fall 2010
¹⁵ Overby, J. Case Study, Fall 2010

Conclusion

By creating a digital connection between students, instructors, and the course, McGraw-Hill's Connect digital learning platform has proven to improve teacher and student performance across a variety of metrics. Because Connect provides tools to reduce administration time, instructors focus on creating engaging lectures and leading in-depth discussions, covering more advanced content throughout a course. When instructors have access to real-time data they modify their teaching methodologies for each class, which has shown to improve students' academic performance and concept retention. Students are able to stay connected to the course and get real-time feedback while they're learning, allowing them to be better prepared for higher level learning in and outside of the classroom. Based on this aggregation of data from a cross-section of higher education institutions, it's clear that digital learning platforms like McGraw-Hill's Connect increase teaching productivity and learning outcomes for instructors and students, which will ultimately lead to institution-wide improvements such as increasing graduation rates and post-graduate success of students.

Methodology

The performance data used in this effectiveness study is based on case studies conducted by instructors from 18 different institutions of higher education independently from one another. Professors measured the effect of Connect on a set of performance indicators such as student engagement, student performance, student retention, or instructor efficiency based on measurable metrics such as grades, pass rates, retention rates, time spent on activities, and attendance rates. Control and test groups were determined according to context. In some cases, performance metrics were recorded simultaneously between two groups of the same class, one using Connect while the other did not. In other cases, professors recorded the differences between the same course before and after implementing Connect. While each professor had control over what to focus the case study on, and on how to define control and test groups, the methodology for computing performance metrics was consistent across the board.

About Connect

McGraw-Hill Connect® is a first-of-its-kind comprehensive digital learning and teaching system, helping usher in a new era of cutting-edge, digital-based instruction that will help improve student performance. The introduction of this groundbreaking digital, adaptive learning solution builds on the company's success in digital education solutions and more than 100 years of experience in curricula development.

Connect is currently being used by more than 1.1 million students and professors and thousands of colleges and universities nationwide, with over 170 course titles across 50 academic disciplines from which to choose.

To learn more, visit www.mcgrawhillconnect.com.