PEREGRINE
GLOBAL SERVICES

ACADEMIC LEVELING

CASE STUDIES AND DATA TRENDS

CONTENTS

INTRODUCTION

Academic leveling refers to a process by which students are oriented, or leveled, to a field of study. Since 2013, Peregrine Global Services has been at the forefront of this approach, offering Academic Leveling Modules to colleges and universities. Leveling modules provide a foundation of knowledge for students to build upon in their graduate studies. Therefore, students can delve deeper into their graduate studies and have a solid platform for maximizing their comprehension and application potential.

Deans for Impact identified several cognitive principles that, when incorporated, can substantially enrich academic curriculum development. Recent advancements in cognitive science further support these principles and provide valuable insights into how individuals process and retain information. One of the salient findings is that effectively transferring new data into long-term memory is instrumental in refining problem-solving skills and knowledge application.

Consider the following principles:

- How students understand new ideas: Students learn new ideas by referencing ideas they already know. Knowledge builds upon itself, and so a curriculum must be well-sequenced to ensure students have the prior knowledge they need to master new ideas.

- How students learn and retain new information: Practice is essential. When instructors space practice over time, they help learners retain information for the long term.

- How students solve problems: Students have limited working memory to solve problems. By committing specific key facts to long-term memory beforehand, they can use working memory for problem-solving and access facts, knowledge, and skills from long-term memory when required.

- How students transfer learning to new situations: The ability to transfer knowledge to a novel problem requires knowledge of the problem's context and structure. Educators increase the student's ability to transfer knowledge by providing sufficient background knowledge (Deans for Impact, 2015).

Academic leveling supports these principles as a student matriculates into a graduate program. When students have a solid foundation of knowledge anchored in their long-term memory, they find themselves better equipped to tackle advanced concepts, retain crucial information, and confront challenges. Continually reinforcing these foundational concepts throughout their academic journey ensures swift and efficient recall, streamlining the problem-solving process, thereby ensuring they are prepared for success.

Student knowledge is typically gauged through pre- and post-tests during the leveling process. This repetitive testing method aligns with the concept of retrieval practice, a technique recognized for assisting students in embedding knowledge into their long-term memory. Agarwal et al. (2012) confirmed that students performed better on topics they were quizzed on and retained this information longer, even revisiting the material at the semester or year's end. We aim to delve deeper into the impact of early introduction to these pivotal concepts and their testing on long-term memory, retention, and overall academic achievement.

Key Features of
Academic Leveling Modules

Academic Leveling is a process in which learners build the foundational knowledge necessary to succeed in their program. Peregrine's Academic Leveling Modules consist of short online content covering the core subjects common within business and healthcare management programs. The content's modular nature ensures that schools can pick the topics important to their program while keeping content broken into smaller chunks that are more digestible for learners. Modules use best practices in curriculum design to give learners the confidence and knowledge needed to succeed. Module content take approximately 4-6 hours to complete.

2 Years of Access

Learners can access their modules for two years to reference the material throughout their program.

The Academic Leveling Modules were developed to ensure incoming learners are adequately prepared for graduate programs. Since then, they have shown long-term positive impacts on knowledge retention.

Cost Effective & Easy to Adopt

Modules cost a fraction of what it costs to deliver prerequisite or co-requisite courses, thereby removing barriers for learners.

Also, Peregrine offers various purchase options, including bookstore purchase, monthly invoices for modules used, and student self-purchase at the time of module registration. By providing these options, many schools have quickly adopted our modules for leveling purposes. Schools can place the module into their program through LTI integration with their LMS or a school-branded microsite.

Pre-test & Post-test Construct

The power of Academic Leveling is that it offers learners a competency-based approach to building their foundational business knowledge. By integrating a pre-test and post-test, institutions can effectively measure a learner's relative competency to determine whether learners need to complete the module. Additionally, the post-test helps learners demonstrate knowledge after completing the instructional content.
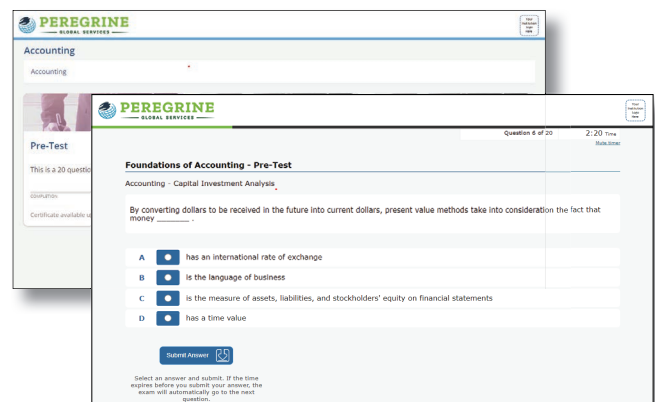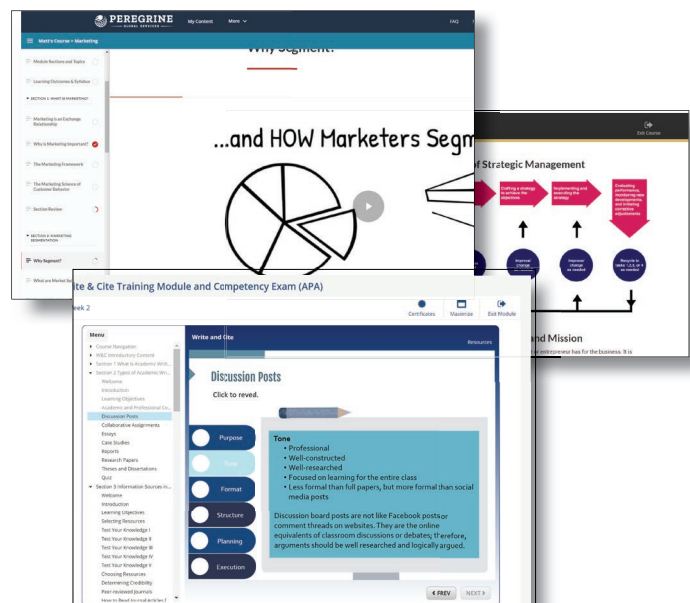
Overview of Peregrine's 16 Academic Leveling Modules

The following represents the 16 Academic Leveling Modules provided by Peregrine. Modules are paired with a pre-test and a post-test to promote learning through assessment and help institutions effectively measure discipline specific knowledge. The online, self-guided modules provide flexibility to institutions, as their students can complete the modules asynchronously either before admissions, in an introductory course, or in conjunction with other coursework required for their programs.

Accounting

The Accounting module empowers students by providing a foundation in essential accounting principles. This module was designed to enhance understanding and application of key accounting concepts, from financial statement analysis and capital investment evaluation to an overview of the Sarbanes-Oxley Act and internal controls. Upon completing this module, students will know the basics of financial statement analysis, capital investments, internal controls, and budgeting and cost systems.

Business Communications

The Business Communications module equips learners with strategies for effective communication within various organizational contexts. It provides a comprehensive overview of establishing credibility, effective written and oral communication strategies, organizational interpersonal dynamics, and professional presentation preparation and delivery. Students will grasp the importance of clarity and coherence in business messaging, the nuances of internal versus external communication, and the management of high-risk situations through effective communication. They will also understand the significance of audience analysis, electronic communication tools, and communication's role in organizational culture and group dynamics. This module prepares students to be adept communicators capable of crafting messages that align with organizational goals and resonate with diverse stakeholders.

Business Ethics

The Business Ethics module guides learners through the intricate maze of organizational ethics, providing a solid foundation and shaping decision-makers who can navigate complex scenarios with integrity and responsibility. Participants will review the culture of ethics globally, exploring topics from ethical leadership styles to the societal impacts of business choices. The curriculum equips students to dissect historical and contemporary ethical frameworks, allowing them to understand the essential role of ethics in business performance.

Business Finance

The Business Finance module gives learners the introductory knowledge to develop the critical skills to transform accounting and tax data into actionable insights. It offers a comprehensive overview of financial statement and cash flow analysis, strategic planning for growth and control, adept management of debt and financial instruments, and discerning capital budgeting and returns evaluation. Students will know the basics of financial performance, operating and strategic plans, the impact of interest rates on securities, and profitable investments through informed capital budgeting techniques.

Business Integration and Strategic Management

The Business Integration and Strategic Management module equips learners with the foundational knowledge necessary to synthesize various aspects of business operations into a cohesive and effective organizational strategy. This module offers a comprehensive overview of strategic decision-making, competitive advantage formulation, multifunctional management approaches, and the integration of internal processes and external relationships to achieve organizational goals. Students will grasp the essentials of analyzing an organization's position using SWOT and the Five Forces Model, developing and executing strategic plans, understanding the dynamics of strategic leadership, and applying continuous improvement methodologies to maintain a competitive edge. Through this module, students will be well-prepared to grow their knowledge in navigating complex business environments and leading their organizations toward sustained success and growth.

Business Leadership

The Business Leadership module provides learners with a comprehensive overview of leadership's critical role within an organization. Students will explore core concepts such as leadership traits, styles, and decision-making processes and learn to interpret critical characteristics of effective leaders, including emotional intelligence, strategic vision, and integrity. The curriculum includes an examination of transformational and transactional leadership, development and succession strategies, and the role of a leader in team dynamics and organizational culture. Upon completion, students will know the basics of becoming an impactful leader, communicating a vision, inspiring and managing a team, and adapting to various situational contexts.

Global Dimensions of Business

Nearly every business today, whether large or small, has global relevancy. Leaders at all levels need to understand how a business can be global and gain a broader competitive advantage. This module discusses strategizing in an international context, managing and leading within a global environment, multinational strategies and structures, foreign market entry, and becoming a savvy global strategist.

Human Resource Management

The Human Resource Management module offers a broad overview of talent acquisition strategies, training and development programs, strategic compensation plans, and legal compliance. Students will grasp the essentials of conducting thorough job analyses, devising competitive and fair compensation schemes, fostering a respectful and ethical work environment, and ensuring rigorous adherence to employment laws and regulations. In addition to focusing on the internal dynamics of HRM, this module emphasizes the strategic importance of human resources in achieving sustainable competitive advantage. Students will learn to integrate human resource management strategy with the organization's broader system, leveraging human capital to drive organizational performance. Through this module, students will be well-prepared for their graduate studies in human resource management.

Information Management Systems

In the modern business environment, many employees have specific roles and responsibilities related to information management systems, technology, and data systems. This module provides a comprehensive overview of the IT function with specific instruction on information systems, business hardware and software, networks and telecommunications, and information-based decision-support systems.

Legal Environment of Business

The Legal Environment of Business module equips learners with the essential knowledge necessary to navigate the intricate legal landscapes in which modern businesses operate. Beyond mere compliance, this module fosters an understanding of the legal frameworks governing business formation, structure, and operations. Students will engage with practical and theoretical aspects of business law, understand the elements and importance of contracts, and compare various business organizational structures. Particular emphasis is placed on the ethical principles that should guide business conduct, fostering a strong sense of corporate social responsibility and ethical decision-making. Furthermore, in recognition of the increasingly global nature of business, this module extends its reach beyond domestic legal systems to explore the complexities of international trade laws, global dispute settlements, and the legal aspects of managing a global business, thereby preparing students to operate confidently and responsibly in a global legal context.

Macroeconomics

The Macroeconomics module provides learners with a foundational understanding of how individuals, households, firms, governments, and foreign entities interact in a nation's economy. Students will explore core concepts such as scarcity, choice, and opportunity cost and learn to interpret key indicators, including GDP, inflation rates, and unemployment data. The curriculum includes an examination of supply and demand dynamics, the Keynesian economic model, business cycles, and the role of government in economic stabilization. Upon completion, students will know the basics of analyzing complex economic conditions, forecasting trends, and applying this knowledge to strategic planning.

Microeconomics

The Microeconomics module provides a basic understanding of how individual decisions by sellers and buyers affect the allocation and use of scarce resources. This module delves into the heart of consumer choice theory, the dynamics of supply and demand, the nuances of market elasticity, and the critical analysis of production and cost structures. Students will know the essential concepts of opportunity cost and trade-offs, understand the factors influencing pricing strategies through supply and demand interactions, explore the various forms of market elasticity and their implications on business strategy, and examine how production decisions relate to business profitability.

Marketing

The Marketing module navigates the complexities of making products conveniently accessible in today's diverse marketplace while effectively communicating their benefits through strategic advertising. This module is grounded in the robust, logical frameworks of economics and human behavior that underpin successful marketing strategies, empowering companies to enhance customer satisfaction and bolster profitability. Key areas covered include the 5 C, STP, and 4 P frameworks, segmentation and target marketing strategies, distribution/channel management, and market research. By the end of this module, learners will have a basic understanding of core marketing principles.

Operations/Production Management

In the Operations/Production Management module, learners will review the nuances of operations strategy within a single organization and across multiple organizations, explore global supply chain strategies, and understand the defining elements of quality. The instructional content covers why and how organizations strive for quality improvement, drawing from historical insights and teachings of quality management pioneers. The module broadly covers quality management frameworks, including Six Sigma, and provides hands-on experience with qualitative and quantitative quality improvement tools. Beyond quality management, the module also extends into project management, presenting learners with various tools and techniques for effectively steering projects to success.

Organizational Behavior

The Organizational Behavior module covers the dynamics of individuals and groups within a workplace setting, exploring the internal processes and practices that influence performance and well-being. Core topics explored include defining Organizational Behavior (OB), understanding organizations as systems, analyzing managers' myriad functions and roles, and examining individual behaviors, personality traits, and how these elements interact in group and team dynamics. Communication, a vital part of organizational behavior, is studied in detail. This module also reviews leadership theories, organizational structures, motivation models and theories, and the unique elements of organizational culture.

Quantitative Research Techniques & Statistics

In the complex and data-driven business environment, effective organizational decision-making must be grounded in sound statistical analyses and research to succeed in a globally competitive world. Business statistics involves the collection, summarization, analysis, and reporting of numerical findings relevant to a business decision or situation. This module provides a complete picture of statistical concepts and their practical applications and will demonstrate how statistical methods are vital tools for modern business leaders.

INTEGRATING PEREGRINE'S ACADEMIC LEVELING MODULES: YOUR GUIDE TO SEAMLESS IMPLEMENTATION

Peregrine's Academic Leveling Modules are exclusively online, offering easy integration into your learning management system or a school-branded microsite that our team will build on your behalf.

Scenario 1: Pre-program Assessment

1. Administer Peregrine's Inbound Exam to new students.
2. Identify knowledge gaps.
3. Assign and complete the necessary modules.
4. Once passed, students are ready for the graduate program.

Scenario 2: Introductory Course Integration

1. Embed modules into a 3-credit or 1-credit introductory course.
2. Make the course mandatory for all students, ensuring everyone starts from the same knowledge base.

Scenario 3: Core Course Enhancement

1. Incorporate modules into core courses.
2. Have learners complete the modules during the initial weeks of the term. Doing so frees instructors from reviewing foundational concepts, enabling them to focus on advanced topics.

Scenario 4: Admission Prerequisite

1. Require that aspiring graduate program students purchase and complete certain modules.
2. Upon passing, learners bridge their knowledge gaps and gain program admission.

Choose the scenario that best aligns with your program's objectives. The Peregrine team will provide our collective expertise to help you find an implementation method that makes the most sense for your students and program needs.

CASE STUDIES

CASE STUDY: **DEVOE SCHOOL OF BUSINESS AT INDIANA WESLEYAN UNIVERSITY**

Dedra Daehn
Director of Curriculum and Operations
DeVoe School of Business
Indiana Wesleyan University

APPLICATION OF THE CPC-BASED LEVELING MODULES

The DeVoe School of Business began using the CPC-based leveling modules in 2017-18. We found that the best solution for our students was to integrate these modules directly into the graduate program start course, MGMT-501- Foundations of Graduate Business.

Setting it up within the start course posed many advantages for students and the school, including:

1) The elimination of the need to track and monitor which incoming students would take the CPC-based leveling exams since this course would be required for all incoming graduate students in both the Master of Science and MBA programs;

2) Not requiring students to complete a prereq course to demonstrate their proficiency in key business skill areas; and,

3) Avoid having students take the CPC-based leveling modules independently (through the Peregrine website) or through another structure, such as an orientation course, prior to starting their program of study.

When the CPC-based leveling modules were first integrated into the start course, all students, even those with undergraduate business degrees, were required to take the CPC-based leveling modules. We have continued this practice as end-of-course survey results, course success rates, and anecdotal comments from students in MGMT-501 continue to validate the need and value to incoming students in preparing them for graduate business study. For students with an undergraduate business degree, we found these students still appreciated the modules as they served as a refresher in key business areas.

Using the CPC-based leveling modules provides the School with an assurance to both internal and external stakeholders, such as HLC and ACBSP, that incoming students are prepared for graduate business study. The CPC-based leveling exam results are used as part of the School's overall student outcomes assessment portfolio of measurements to gauge and monitor student learning.

BACHELOR'S DEGREE ANALYSIS FOR EXAM AND CPC LEVELING

The DeVoe School of Business started its analysis using a randomly selected group of 98 learners identified as having an undergraduate degree in business with a (Y) or not (N). The list was used for the leveling module analysis to access their pre-test and post-test scores for the comparison. We found that students with an undergraduate bachelor's degree in business did slightly better on the module pre-test than non-business students. Interestingly, we found little difference between the two groups regarding performance on their post-test. There was very little difference between the two groups regarding the number of post-test attempts.

Since IWU requires learners to complete leveling modules if their Inbound topic-level score falls below our established threshold, the proportion of the number of modules completed between the two groups was examined. There were 57 (58% of the 98) non-business undergraduate students and 41 (42% of the 98) business undergraduates. It was found that about the same proportion of modules are completed by non-business students (N=501, 59% of the 853 modules in the sample) compared to business students (N=352, 41% of the 853 modules in the sample).

We saw from the Inbound scores that business students perform better on the Inbound Exam than non-business students; however, both groups need higher scores to warrant not having to do the module. Based on another previous analysis that was completed, the leveling program is working well in helping to review/teach the fundamentals before starting the graduate program.

When conducting the Inbound Exam analysis, we removed those students who took the customized exams and only utilized the MBA pure results, which reduced the sample size from 98 to 54 students (22 with a business bachelor and 32 without a business bachelor). As expected, students with a business bachelor's degree tend to do better on the Inbound Exam compared to students who do not have a business bachelor's degree. This finding helps confirm the validity of the instrument. Although it is a small sample size, the trends make sense.

The Outbound Exam analysis also required that the customized exams be removed, which further reduced the sample size to 20 students (9 with a business bachelor and 11 without a business bachelor). We saw results for this analysis as more varied, which is also expected

IMPACT ON STUDENT LEARNING

A comparison of the Outbound Exam scores was conducted of students who completed the master's degree program before taking the CPC-based leveling modules and after completing the CPC-based leveling modules. This comparison was conducted to determine what, if any, impact the leveling modules had on student performance as expressed by the student's Outbound Exam Scores.

The Outbound Exam results from July 2017 through December 2020 (N=694) were summarized by annual time periods and separated into two groups: Outbound Exam results from students graduating from the program who did not complete the leveling modules at the start of their program (N=588) and Outbound Exam results from students who did complete the leveling

modules at the start of their program (N=106). The first three time periods included students who did not complete the leveling program (Pre-leveling) and the last two time periods included students who did complete the leveling program (Post-leveling). The data were evaluated using regression analysis.

As shown in Figure 1, the student's Outbound Exam scores consistently improved for those who completed the CPC-based leveling modules at the start of their master's program, R^2=0.9412. Post-leveling Outbound Exam Scores (N=106) were significantly higher than the Pre-Leveling Outbound Exam Scores (N=588), $t_{.050}$=1.960, p<.000.

DSB-IWU Master's Outbound Exam - Total Exam % Score
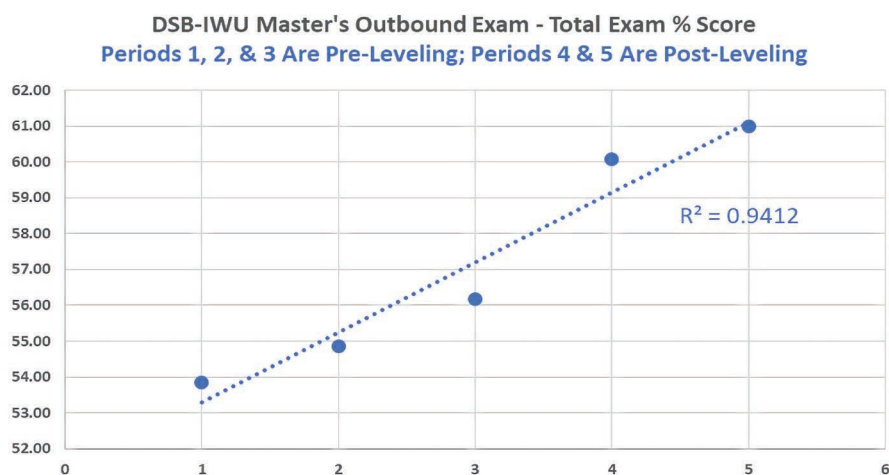**Periods 1, 2, & 3 Are Pre-Leveling; Periods 4 & 5 Are Post-Leveling**

$R^2 = 0.9412$

Figure 1. Outbound Exam Total Scores from 7/1/2017 through 12/31/2020 plotted by time period for The DeVoe School of Business. Post-leveling Outbound Exam Scores (N=106) were significantly higher than the Pre-Leveling Outbound Exam Scores (N=588), $t_{.050}$=1.960, p<.000.

In Figure 2, the student's overall percentile rank also consistently improved for those who completed the CPC-based leveling modules at the start of their master's program, R^2=0.9496. The percentile rank of Post-leveling Outbound Exam Scores (N=106) were significantly higher than the Percentile Rank of Pre-Leveling Outbound Exam Scores (N=588), $t_{.050}$=1.960, p<.000.

DSB-IWU Master's Outbound Exam - Total Exam Percentile Rank
Periods 1, 2, & 3 Are Pre-Leveling; Periods 4 & 5 Are Post-Leveling
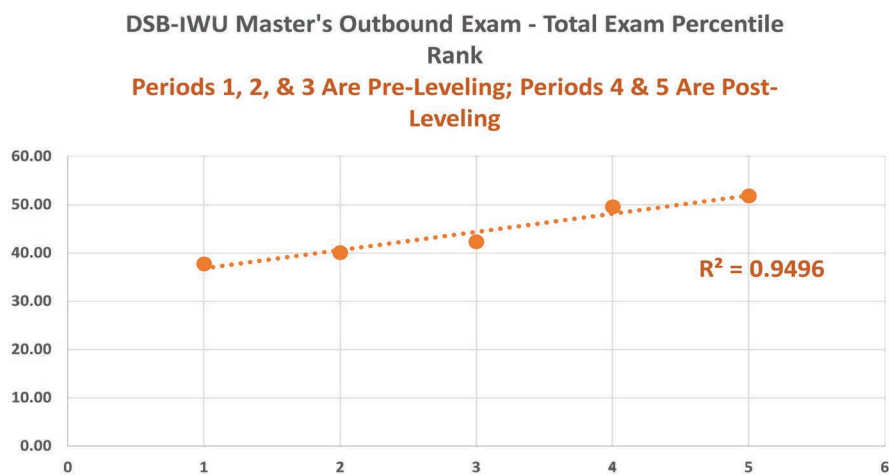
$R^2 = 0.9496$

Figure 2. Percentile Rank of the Outbound Exam Total Scores from 7/1/2017 through 12/31/2020 plotted by time period for The DeVoe School of Business. The Percentile Rank of Post-leveling Outbound Exam Scores (N=106) were significantly higher than the Percentile Rank of Pre-Leveling Outbound Exam Scores (N=588), $t_{.050}$=1.960, p<.000.

TRENDS AND OBSERVATIONS

Some trends, observations, and adjustments made as a result of instituting the CPC-based leveling modules include the following:

We found the need to work closely with the faculty group teaching MGMT-501 and to provide them training for the CPC-based leveling modules, why they are being used, why they were integrated into MGMT-501, how they are set up in the course, and how to support students to help ensure they stay on track to complete the 12 CPC-based leveling modules within the six-week-course. As a result, we are now updating the course so that students take the CPC-based leveling pre-test for each module within the first couple of weeks of the course. We believe this change will help students to identify earlier in the course which topics they have successfully completed and those modules that require more focused study and reviewing of the module content before taking the second exam.

Initially, we set the performance for passing each module at 70% or higher on either the pre-test or the first or second post-test. The majority of students were able to meet this percentage. However, many students often struggled to pass one or two of the modules and expressed concerns and frustration at being unable to pass at the 70% rate. We found in the data that students were more often very close to the 70% passage rate but were still unable to attain it. As a result, we recently lowered the passage rate to 60% since the university recognizes this level of performance passing.

In reviewing students' performance by topic on the Inbound Exam, we found that those with an undergraduate business degree performed significantly higher on all topic areas except for organizational behavior. This may be partly due to our student population being working adults with work experience applicable to this topic. Also, the Organizational Behavior module is not exclusive to business study, and students may have had exposure to it in their undergraduate program of study. The topic with the highest performance level for students with an undergraduate business degree was Operations/Production Management. Average topic-level scores on the Inbound Exam were 45.00 for those with an undergraduate business degree and 40.81 for those without.

Outbound performance by topic showed that students with an undergraduate business degree scored significantly higher in Accounting, Macroeconomics, Global Dimensions of Business, Marketing, and Quantitative Research Techniques and Statistics when compared to those students without an undergraduate business degree. Average topic-level scores on the Outbound Exam were 50.50 for those with an undergraduate business degree and 49.65 for those without.

The MGMT-501 course success rate (grade C or higher) averaged 97% over the last three years. It should be noted that students must successfully pass all of the CPC-based leveling modules in MGMT-501 to pass the course. A block of points is added to the student's grade after completing all the modules.

Dedra Daehn currently serves as the Director of Curriculum & Operations for the DeVoe School of Business at Indiana Wesleyan University. Dedra has over 30 years of administrative experience in higher education with academic programs and operations management, outcomes assessment, accreditation, and strategic planning. In addition, Dedra has over ten years of experience teaching undergraduate business courses. One of the highlights of her career was serving as an independent consultant for nearly ten years, working with numerous colleges to develop and enhance their strategic planning processes, student and institutional assessment programs, and regional and specialized accreditation initiatives. Dedra and her husband Brian reside in Marion, IN, and have five grown daughters. They enjoy playing golf, traveling, taking long walks, and seeing live Broadway musical performances.

CASE STUDY: **THE AMERICAN COLLEGE OF FINANCIAL SERVICES**

Joann Adeogun, DBA
Program Director, Masters of Science in Management &
Executive Leadership Programs
The American College of Financial Services

The American College of Financial Services ("The College") is using the Academic Leveling Modules for the first time to prepare students entering the revised Master of Science in Management program who do not hold a business or management undergraduate degree for success. The success of graduate students is enhanced when they understand the basic concepts of each management course due to completion of the modules. Thus, the Academic Leveling Modules are strategically aligned with foundational business knowledge, student retention initiatives, and program and course learning outcome measurement.

ACADEMIC PROGRAM INTEGRATION

Students applying for admission to The College who do not hold an undergraduate degree in a business or management-specific area are placed in the Foundations of Management Course to gain the needed knowledge before entering into the graduate degree program. The course contains nine academic leveling modules:

1. Foundations of Communication
2. Foundations of Business Integration & Strategic Management
3. Foundations of Organizational Behavior
4. Foundations of Human Resource Management
5. Foundations of Finance
6. Foundations of Marketing
7. Foundations of Statistics
8. Foundations of Business Ethics
9. Foundations of Academic Writing

Some students will need all nine modules, while others may have taken an identified business or management course as an elective. Thus, the Foundations of Management Leveling Course could assign different module variations to the students. All academic leveling modules require a passing score of at least 70% before progressing in the graduate degree program courses. The program director is also the facilitator within the course to keep students motivated and as a resource for questions.

IMPACT OF LEVELING

The Academic Leveling Modules were used for the first time at The College in April 2021. However, in my previous experience of using the Academic Leveling Modules at another Christian and For-profit institution, we saw a positive impact on:

- Student confidence with the subject being taught within the undergraduate and graduate programs.

- Student retention efforts: Students felt prepared for the courses in the program, and any frustration experienced was not due to a lack of understanding of a particular subject.

- Ability to meet program and course learning outcomes.

- Comparison to external accreditation and college or university scores of the same modules. The leveling modules allow us to see if students coming in with more or less knowledge (pre-test) perform about the same, less or better compared to other students after completion of the modules (post-test).

PROGRAM IMPROVEMENT

The College has just adopted the Academic Leveling Modules within the Foundations of Management course before entry into the MS in Management program. However, the expectations are that students will perform better, given the opportunity to learn more about the courses they will complete in the graduate program.

All students are also being given the Inbound Assessment in the Graduation Management Orientation course after completing the Academic Leveling Modules. It would be interesting to see if students score better on the Inbound Assessment after completing the Academic Leveling Modules compared to those who still need to complete the modules due to holding an undergraduate in business or management.

Dr. Joann Adeogun is the Program Director for the Masters of Science in Management & Executive Leadership programs at The American College of Financial Services. Dr. Adeogun is the George G. Joseph and Richard A. Liddy Chair in Practice Management & Leadership.

She holds designations as a Professional in Human Resource Management (PHR), Society of Human Resource Management Certified Professional (SHRM-CP), Six Sigma Black Belt (SSBB), Change Management Specialist (CMS), Certified Manager (CM), and recently obtained a Certificate in Digital Marketing. She has worked in academia for 20 years in various universities and colleges, including non-profit, Christian, state, for-profit, and private institutions.

Dr. Adeogun has recently worked as a program and department chair in start-up undergraduate and graduate programs, developing and designing programs and curricula, working with universities of over 30,000 students, and leading and implementing academic policies and procedures. She has academic experience in compliance, assessment, institutional effectiveness, accreditation (regional, programmatic, and alignment), training, coaching, partnership development, and recruitment. Her teaching experience includes online, hybrid, campus, accelerated weekend intensive, practicum, and travel as an associate, assistant, or adjunct professor.

Dr. Adeogun received her bachelor's degree from Shorter University in Business Management, a Master of Science in Human Resource Management from Troy University, and a DBA in Business Administration specializing in Human Resource Management from Nova Southeastern University.

CASE STUDY: **NORTHCENTRAL UNIVERSITY**

Richard C. Thompson
Professor and Lead Faculty – MBA Program
Northcentral University (NCU)

APPLICATION OF THE LEVELING MODULES

All 15 of Peregrine's leveling modules are used in our Leveling Courses SKS-5001 and SKS-7001. The SKS courses (5001 and 7001), Comprehensive Strategic Knowledge Studies, provide students with the opportunity to gain foundational terminology and knowledge in 15 different areas important to business and management. The 8-week SKS courses serve as a bridge for students who do not have prior business degrees.

NCU's Business Administration programs have received programmatic accreditation from the Accreditation Council for Business Schools and Programs (ACBSP). ACBSP defines their Undergraduate Common Professional Component (CPC) in ACBSP Criterion 6.4, which describes the course content that must be included in courses taught in all accredited undergraduate programs. Furthermore, Criterion 6.5.b for incoming masters level students and Criterion 6.6.b for incoming doctoral-level students require that students admitted to a graduate-level business program without prior business degrees are competent in the undergraduate CPCs. NCU uses the Peregrine leveling modules to provide that core competence.

PROGRAM INTEGRATION

Students entering one of NCU's master's level business programs (MBA, MSA, and MSOL) or a doctoral program (DBA, Ph.D.-BA, and Ph.D. OL) without a prior business degree enter on an Evaluation Track. At the master's level, students on the Evaluation Track take SKS-5001, Comprehensive Strategic Knowledge Studies, as the second course in the program and prior to all remaining courses. Students entering one of the doctoral programs on the Evaluation Track take SKS-7001 as their second course and prior to all remaining courses.

In both SKS-5001 and SKS-7001, Peregrine's Academic Leveling Modules for each week are matched with written assignments that provide the student with the opportunity to demonstrate comprehension of the module content for that week.

LEVELING IMPACT

NCU is an open-enrollment school that does not require admission testing. Therefore, the NCU School of Business (previously School of Business and Technology Management) had to identify a means to provide students interested in a graduate level business degree, but who did not have a prior business degree, with the foundational knowledge to help them succeed in their chosen program.

The School of Business had already established a relationship with Peregrine Global Services through the adoption of their Outbound Exam in May 2015 and during the establishment of that relationship, had identified that Peregrine's Academic Leveling Modules aligned with the ACBSP CPCs. NCU subsequently adopted the leveling modules in September 2015.

Given that the Outbound Exam is used in the MBA program, some of the students also take Peregrine's leveling modules. Assuming a program completion rate of 18-24 months, the first cohort to see the effect of the Academic Leveling Modules on the Outbound Exam was in the third period, AY 2017-2018. In total, five periods of results were examined from Academic Year 2015-2016 to AY 2019-2020 with the first two periods where students did not benefit from the modules and the last three periods where students may have benefitted from the modules.

During this 5-year period, both the Mean Outbound Test scores and the Mean Total Exam Percentile Rank showed a steady improvement from the two periods without the benefit of the leveling course with the subsequent three periods that did benefit from the leveling course. The regression culated over the 5-year period demonstrated a strong correlation with R^2 scores of .6875 for change in the Outbound Exam Mean Total Percentile Score, and .7045 for the Outbound Exam Mean Total Percentile Ranking.

TRENDS AND OBSERVATIONS

For the calendar year 2019, we researched our student's performance on the post-test scores in the leveling course. Overall, master's students have an 80% passing rate, and doctoral students have an 83% passing rate. For all students, post-test scores ranged from 61% for the Foundations of Business Finance module to 95% for the Foundations of Information Management Systems module. **Additionally, and more importantly, we had identified that due to the strength of Peregrine's leveling modules, students who completed the SKS leveling course were equally as likely to graduate as students with prior business degrees.** These results were then brought back to the SKS courses to work on modifying our supplemental written assignments to provide greater emphasis and clarity on areas needing improvement.

ASSURANCE OF LEARNING

Data from the leveling courses and the Outbound Exam have been incorporated into Annual and 5-year Program Reviews in the respective programs. Peregrine's leveling modules have enabled NCU to demonstrate to our accreditor that students without prior business education are able to demonstrate competency in the ACBSP's Undergraduate Common Professional Component. The Outbound Exam is used in the MBA program in the Capstone course. The aggregated results from the Outbound Exam are reviewed in each of the tested areas. NCU business programs use Peregrine's assessment services and leveling modules in combination with retention and graduation rates, student surveys, ILO and PLO assessments, and PSOL results as part of a comprehensive assessment process to identify opportunities in the program.

PROGRAM IMPROVEMENT

As identified earlier, the MBA NCU program has seen steady improvements in the Outbound Exam scores in the three years since adopting leveling modules. The regression culated over the 5-year period demonstrated a strong correlation with R2 scores of .6875 for change in the Outbound Exam Mean Total Percentile Score and .7045 for the Outbound Exam Mean Total Percentile Ranking.

Richard Thompson received his Ph.D. in Business from the University of Colorado in 1985. Dr. Thompson began teaching through online education in 1999 working for Virginia Tech University and then Jones International University (JIU) in 2003. He has served as an Academic Chair, Founding Dean of the School of Business, Dean of Academic Affairs, Vice president of Academic Affairs and most recently moved to NCU as the Assistant Dean in 2016. Dr. Thompson returned to the classroom in 2017 as a full professor in the School of Business.

ACADEMIC LEVELING DATA ANALYSIS

INTRODUCTION TO DATA ANALYSIS

In recent years, academic institutions have sought innovative measures to bolster the foundational knowledge of learners and ensure a level playing field. One such initiative is incorporating Academic Leveling Modules to equip learners with the essential prerequisites and competencies for their desired area of study. These modules assess and enhance learners' understanding and readiness through a structured pre-test and post-test approach. This whitepaper delves into an in-depth analysis of the annual trends and the effectiveness of Academic Leveling Modules over various academic years. Examining learners' performance aims to elucidate the implications of these modules on learning outcomes.

ANNUAL TRENDS

The pivotal research question steering this analysis section is: What are the trends in learning through the use of Academic Leveling Modules?

The data on Academic Leveling Modules pre-test and post-test scores span seven academic years from 2013 to 2020. The details of each academic year - the number of modules (e.g., 2013-2014 (N=15,691 Modules), 2014-2015 (N=22,478 Modules), and so forth) - are captured in Figure 3. Over the past four years, there has been an average score difference of 40% between the pre-test and post-test assessments. This data points towards a significant knowledge gain, with an average percentage change of 81% based on the differences between the pre-test and post-test module scores.
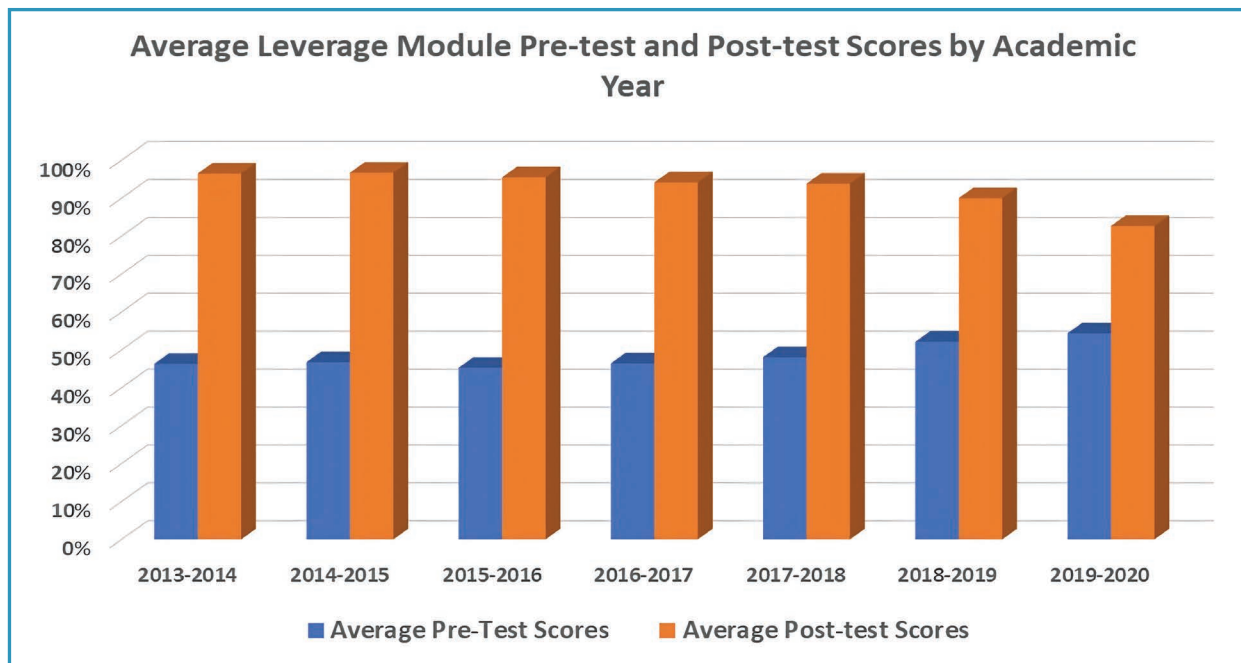

Figure 3. Average Academic Leveling Module Pre-test and Post-test Scores from 2013-2014 through 2019-2020 Academic Years.

PRE-TEST/POST-TEST ANALYSIS

Tied to the annual trends is the pre-test and post-test analysis to ascertain the knowledge gains made by learners. The guiding research question for this analytical segment is: Are learners advancing in their understanding by engaging in the modules used for academic leveling, as exemplified by the difference between the pooled pre-test scores and the pooled post-test scores?

The pooled pre-test and post-test data for the 15 modules used for academic leveling for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30) are shown in Table 1. The pooled pre-test and post-test scores for each module are graphically shown in Figure 4.

Pooled Pre-test and Post-Test Scores for 15 Academic Leveling Modules for Academic Years 2016-2017 through 2019-2020										
Module	Pooled Pre-test Scores				Pooled Post-test Scores				Evaluation	
	Mean	SD	Module Count	Client Count	Mean	SD	Module Count	Client Count	t-Value	Cohen's d
Accounting Fundamentals	56.23%	21.37%	16,078	86	88.72%	13.32%	12,875	83	158.16	1.7815
Business Ethics	60.57%	22.38%	10,497	31	91.72%	11.17%	7,983	32	123.76	1.6932
Business Finance Fundamentals	51.13%	22.60%	16,030	82	86.59%	15.31%	12,838	77	158.43	1.801
Business Integration & Strategic Management	58.99%	24.86%	10,688	41	90.21%	13.23%	7,851	39	110.29	1.5047
Business Leadership	66.30%	23.53%	8,461	32	94.06%	8.89%	5,908	30	98.86	1.4659
Global Dimensions of Business	54.94%	24.35%	10,824	31	90.06%	12.81%	8,328	31	128.65	1.7415
Human Resource Management	62.17%	23.40%	8,178	32	92.99%	9.57%	6,171	31	107.78	1.6442
Information Management Systems	69.16%	22.88%	10,095	36	95.66%	8.31%	6,547	34	106.12	1.4278
Legal Environment of Business	53.60%	22.66%	11,592	36	90.97%	11.18%	9,448	37	155.78	2.0292
Macroeconomics	56.97%	23.50%	8,816	55	88.35%	10.02%	6,931	54	113.02	1.6697
Marketing	57.21%	18.52%	12,692	57	91.11%	11.59%	11,000	57	171.12	2.1605
Microeconomics	54.88%	23.35%	13,560	68	83.05%	12.91%	10,742	65	119.3	1.4487
Operations/Production Management	58.46%	27.97%	8,231	33	93.92%	9.50%	5,881	29	106.73	1.5957
Organizational Behavior	59.91%	23.18%	10,257	40	91.21%	11.92%	7,769	39	117.75	1.6341
Quantitative Research Techniques & Statistics	49.09%	23.95%	15,039	73	84.39%	16.68%	12,010	69	142.53	1.6777

Table 1. Analysis of the pooled pre-test and post-test data for the 15 academic leveling modules for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 Academic Years. All t-values were significant ($p < .000$) and all Cohen's Effect Size d values were high (>0.80).
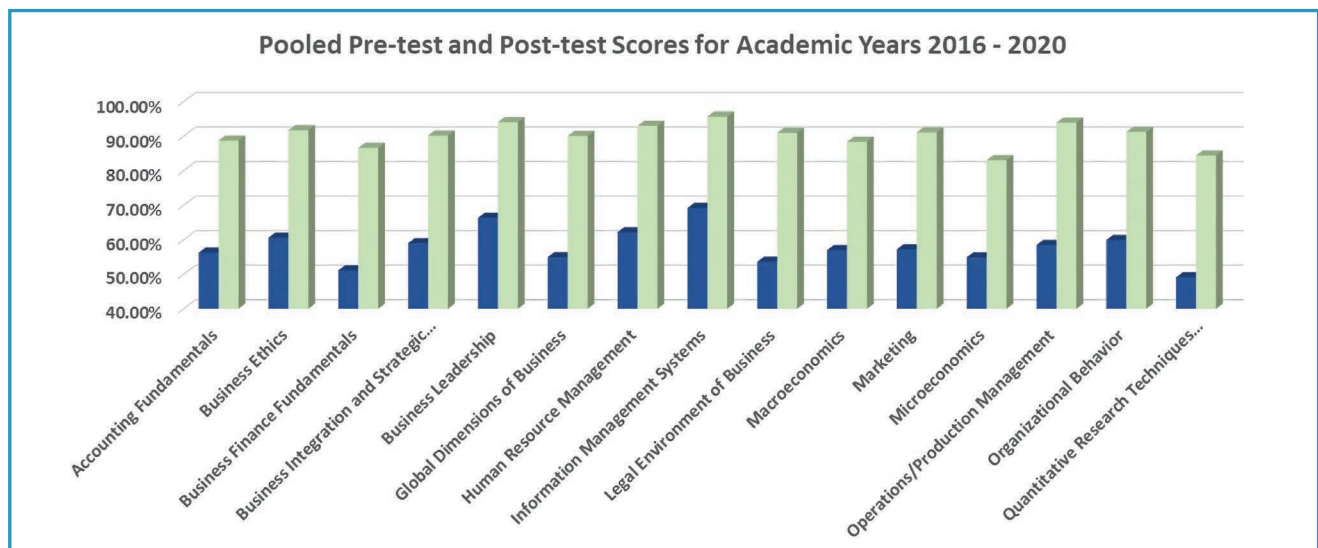

Figure 4. Pooled pre-test and post-test scores for the 15 academic leveling modules for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30).

Upon initial assessment, learners demonstrated the highest proficiency in Business Ethics, Business Leadership, and Information Management Systems. Conversely, they showcased a lower understanding of Business Finance, the Legal Environment of Business, and Quantitative Research Techniques and Statistics. However, post-engagement with the modules, the average pooled post-test scores for all 15 modules soared to 88% or higher, transcending the minimum requirement established by most schools (75-85%).

The quantitative analysis corroborates a significant increase in the pre-test scores for all 15 modules (t>1.960, p<.05, and d>=0.80), evidencing that learners are indeed advancing in their understanding through the utilization of academic leveling modules.

PAIRED ANALYSIS

The guiding research question for this analysis portion is: Are individual learners learning by completing the modules used for academic leveling, as expressed by the difference between the paired pre-test and post-test scores?

Here, paired scores denote those instances where the analysis considers the same learner's performance in both the pre-test and post-test while collating the mean percent change. This mean percent change is derived by averaging the individual learners' differences in scores from the pre-test to the post-test.

Table 2 shows the paired pre-test and post-test data for the academic leveling modules across the academic years 2016-2017, 2017-2018, 2018-2019, and 2019-2020 (July 1 – June 30). This data is also graphically represented in Figure 5.

On average, the paired post-test scores across all 15 modules were 84% or higher, surpassing the standard minimum requirement set forth by most educational institutions (75-85%). This data, further supported by significant increases in pre-test scores across all modules (t>1.960, p<.05, and d>=0.80), demonstrates a notable increase in knowledge through the academic leveling modules.

Paired Pre-test and Post-Test Scores for 15 Academic Leveling Modules for Academic Years 2016-2017 through 2019-2020										
Module	Paired Pre-test Scores				Paired Post-test Scores				Evaluation	
	Mean	SD	Module Count	Client Count	Mean	SD	Module Count	Client Count	t-Value	Cohen's d
Accounting Fundamentals	51.17%	17.96%	12,765	83	88.72%	13.32%	12,765	83	189.73	2.3749
Business Ethics	53.15%	18.27%	7,971	31	91.72%	11.18%	7,971	31	160.76	2.5465
Business Finance Fundamentals	45.29%	17.68%	12,749	77	86.58%	15.31%	12,749	77	199.36	2.497
Business Integration & Strategic Management	49.21%	18.85%	7,829	39	90.20%	13.25%	7,829	39	157.41	2.5159
Business Leadership	55.50%	18.80%	5,899	30	94.05%	8.90%	5,899	30	142.35	2.6211
Global Dimensions of Business	46.52%	18.27%	8,321	31	90.06%	12.82%	8,321	31	177.93	2.7585
Human Resource Management	53.60%	19.42%	6,158	31	92.98%	9.58%	6,158	31	142.71	2.5718
Information Management Systems	57.95%	18.97%	6,539	34	95.66%	8.31%	6,539	34	147.28	2.5757
Legal Environment of Business	47.43%	18.04%	9,441	36	90.98%	11.16%	9,441	36	199.48	2.9034
Macroeconomics	49.29%	19.13%	6,911	54	88.34%	10.02%	6,911	54	150.32	2.5572
Marketing	54.23%	15.98%	10,959	56	91.09%	11.60%	10,959	56	195.39	2.6396
Microeconomics	47.96%	19.20%	10,711	65	83.02%	12.91%	10,711	65	156.8	2.1426
Operations/Production Management	45.50%	20.93%	5,859	29	93.91%	9.51%	5,859	29	161.15	2.9774
Organizational Behavior	51.56%	17.99%	7,739	39	91.18%	11.93%	7,739	39	161.48	2.5959
Quantitative Research Techniques & Statistics	42.70%	18.65%	11,922	69	84.35%	16.70%	11,922	69	181.6	2.3521

Table 2. Paired pre-test and post-test data for the 15 academic leveling modules for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30). All t-values were significant (p < .000) and all Cohen's Effect Size d values were high (>0.80).
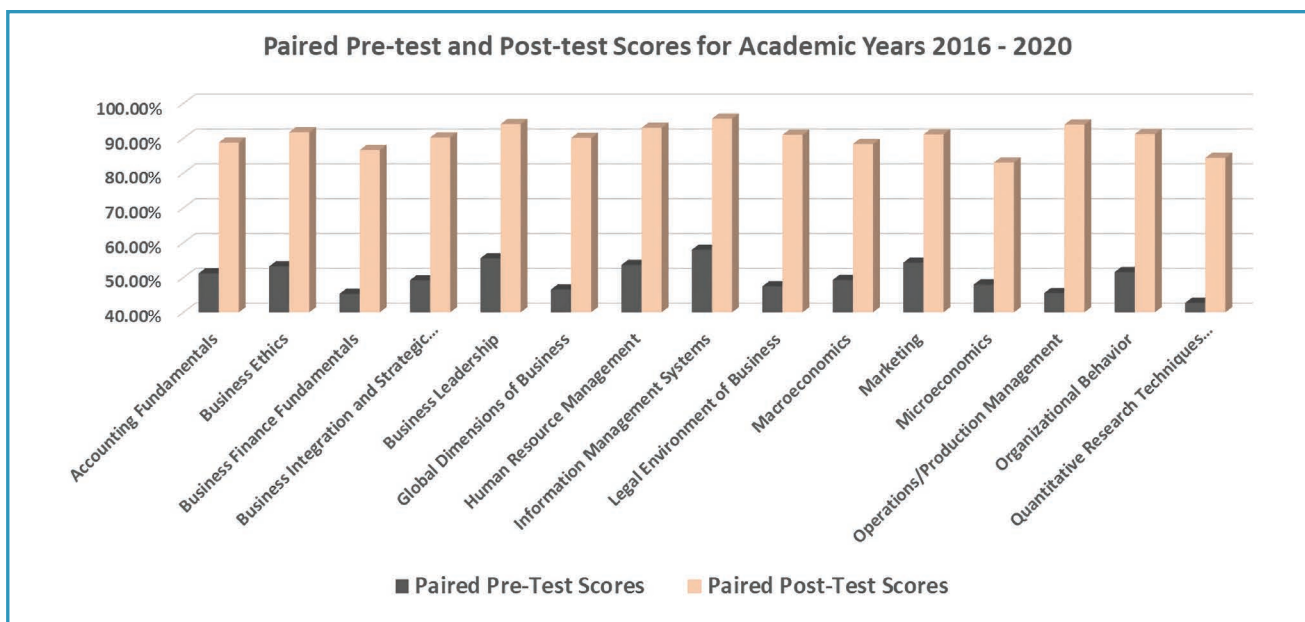
Figure 5. Paired pre-test and post-test scores for the 15 academic leveling modules for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30).

The paired pre-test/post-test score changes, shown in Figure 6, reflect the learners' knowledge gains, demonstrating the module's effectiveness. Notably, learners' knowledge nearly doubled post-module, with an average increase of at least 87%.

Significant improvements were seen in Operations/Production Management (184.77%), Quantitative Research Techniques & Statistics (146.27%), and Global Dimensions of Business (136.58%), where learners initially scored low but showed substantial learning gains. In contrast, smaller increases were noted in Marketing (87.04%), Information Systems Analysis (97.63%), and Accounting (103.62%), indicating these areas had higher baseline knowledge. This suggests learners already grasped these subjects well before the module.
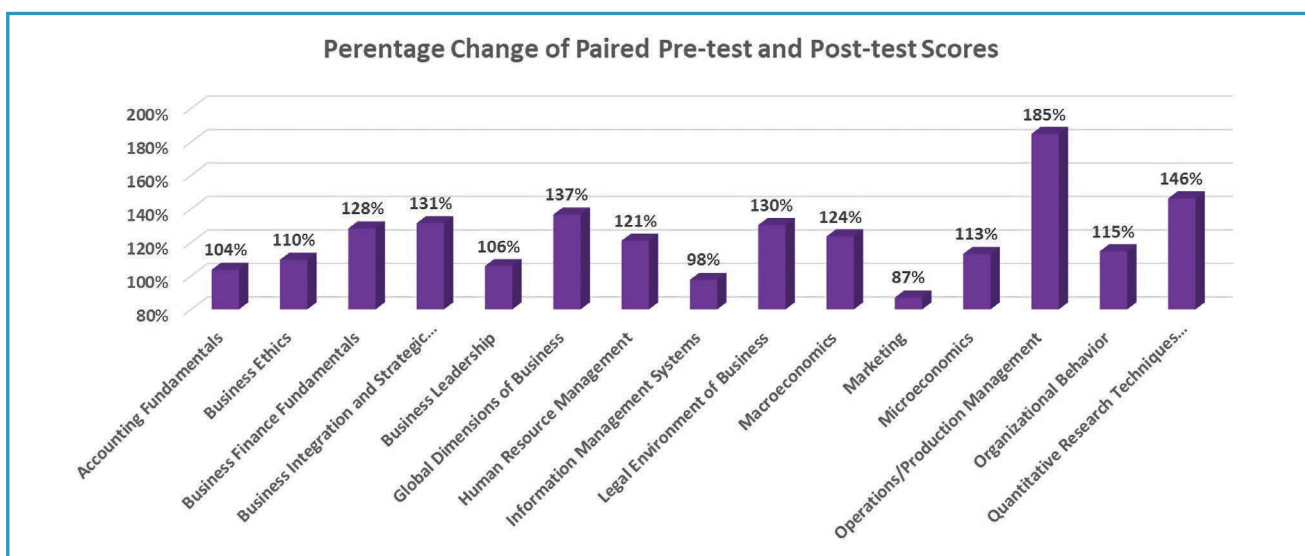

Figure 6. Paired percentage change from the 15 academic leveling modules for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30).

POST-TEST ATTEMPTS ANALYSIS

Aiming to discern the relative difficulty of the modules used for academic leveling, this section of the analysis focuses on the research question: What does the number of attempts students need to pass the post-test reveal about the relative degree of difficulty of these modules?

The 20-question pre-test and post-test are composed of random questions from a test bank based on the module content. Answers are found within the module. Learners must achieve a passing score (70-85%, depending on school criteria) to earn a module certificate. They get one try for the pre-test and two for the post-test. Additional attempts require purchasing a new module, granting two more post-test tries. This approach encourages learners to thoroughly learn the material. The database records scores from the final attempt and tracks the number of attempts made.

Table 3 displays the number and percentage of students passing on their 1st to 4th attempts. Figure 7 graphically represents the percentage of students passing the module post-test on their first try.

Number and Percent Passing Scores Obtained by Learners on the Leveling Modules for Academic Years 2016-2017 through 2019-2020								
Module	1st Attempt		2nd Attempt		3rd Attempt		4th Attempt	
	Count	%	Count	%	Count	%	Count	%
Accounting Fundamentals	11,052	85.84%	1,812	14.07%	11	0.09%	0	0.00%
Business Ethics	6,992	87.60%	985	12.34%	5	0.06%	0	0.00%
Business Finance Fundamentals	10,393	80.97%	2,417	18.83%	24	0.19%	1	0.01%
Business Integration & Strategic Management	6,574	83.73%	1,272	16.20%	2	0.03%	3	0.04%
Business Leadership	5,510	93.25%	395	6.68%	3	0.05%	1	0.02%
Global Dimensions of Business	6,873	82.53%	1,442	17.32%	13	0.16%	0	0.00%
Human Resource Management	5,605	90.83%	559	9.06%	6	0.10%	1	0.02%
Information Management Systems	6,233	95.22%	313	4.78%	-	0.00%	0	0.00%
Legal Environment of Business	7,990	84.57%	1,448	15.33%	9	0.10%	1	0.01%
Macroeconomics	5,706	82.34%	1,217	17.56%	6	0.09%	1	0.01%
Marketing	8,867	80.61%	2,118	19.25%	13	0.12%	2	0.02%
Microeconomics	7,058	65.75%	3,595	33.49%	68	0.63%	13	0.12%
Operations/Production Management	5,446	92.60%	430	7.31%	5	0.09%	0	0.00%
Organizational Behavior	6,711	86.38%	1,052	13.54%	6	0.08%	0	0.00%
Quantitative Research Techniques & Statistics	9,173	76.38%	2,811	23.41%	24	0.20%	2	0.02%

Table 3. Number and percent of passing post-test scores obtained by learners for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30).

Out of 132,269 learners who completed the modules used for academic leveling during the four academic years from 2016 to 2020, 83.30% obtained a passing score on the 1st attempt, and 16.53% obtained a passing score on the 2nd attempt. The majority of students (99.83%) obtained a passing score with either a 1st or 2nd attempt.

Only 220 students (0.17%) needed to purchase a new module to obtain a passing score with a 3rd or 4th attempt. No students needed to obtain a third module for a 5th or 6th attempt during the four academic years.

The more difficult modules, as indicated by the lower 1st attempt passing scores, are Microeconomics (65.75%), Quantitative Research Techniques & Statistics (76.38%), and Marketing (80.81%).
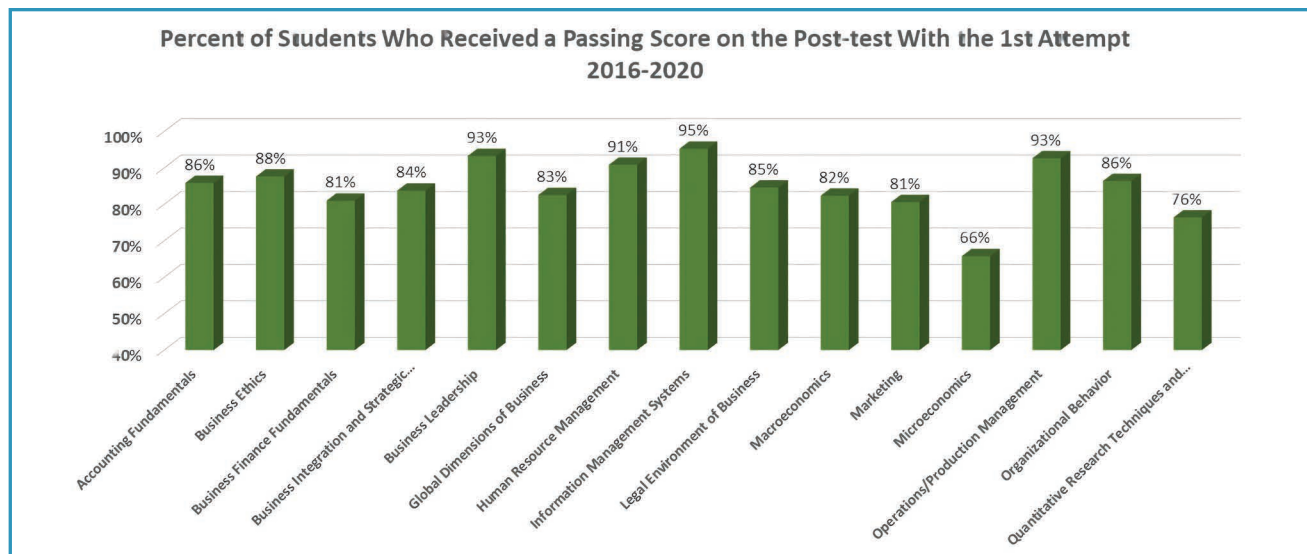

Figure 7. Percent of learners who obtained a passing score by academic leveling module on the 1st attempt for the 2016-2017, 2017-2018, 2018-2019, and 2019-2020 academic years (July 1 – June 30).

KNOWLEDGE LONGEVITY ANALYSIS

The guiding research questions for this portion of the analysis were: *Within the population of schools that conduct both Outbound Exam testing and academic leveling for incoming master's level learners, what, if any, changes have occurred in the knowledge levels of graduating graduate learners as indicated by the Outbound Exam results of students who completed an academic leveling program at the start of their academic program compared to students who did not complete an academic leveling program? Does academic leveling have a positive effect on academic quality beyond its immediate use at the start of the graduate degree program?*

The study sample was selected from 17 schools over six years, with inclusion criteria of at least two years of pre-leveling Outbound Exam data and one year post-leveling. Schools needed a minimum of 30 exams annually to qualify. The sample covered traditional, online, and blended master's programs. The Pre-leveling group consisted of learners who finished an Outbound Exam at their program's end without participating in the initial leveling program.

The data were organized into six academic years including 7/1/2014-6/30/2015, 7/1/2015-6/30/2016, 7/1/2016-6/30/2017, 7/1/2017-6/30/2018, 7/1/2018-6/30/2019, and 7/1/2019-6/30/2020 based on when the Outbound Exam was completed. The data were excluded from the analysis if the annual sample was less than 200 exams.

We excluded exams with completion times more than one standard deviation above the mean, focusing on those where learners likely gave their best effort. The sample mainly consisted of MBA programs, with some MS or MA programs limited to CPC topics for relevant exam data. The annual sample size varied from 604 to 2,293 exams.

To assess changes in Pre-leveling and Post-leveling scores, we compared Inbound Exam scores within the same population, finding no significant difference (Pre-leveling: 49.33%, Post-leveling: 47.92%, $t(124)$ = 1.5485, p = .0620). This suggests the assessment instrument wasn't a significant factor in Outbound Exam score changes, as both exams used the same test bank.

In total, for the 6-year analysis period, the Pre-leveling Outbound Exam score was 52.40% (N=5,864 Outbound Exams), and the Post-leveling Outbound Exam score was 56.41% (N=8,589 Outbound Exams), which represents a difference of 4.01% and a 7.64 percentage change (improvement) in the exam scores.

The differences between the means were significant, t(148) = 6.5803, p <.000. Overall, learners who completed the module-based leveling program at the start of their graduate program had higher retained knowledge compared to learners who did not complete the module-based leveling program as shown in Figure 8.

The percentage change by exam topic for the 6-year analysis period between the Pre-leveling Outbound Exam score and the Post-leveling Outbound Exam score is shown in Figure 9. The percentage change ranged from a low of 3.29% (Marketing) to a high of 14.61% (Quantitative Research Techniques and Statistics).

A 2-sample t-Test showed significant (p<.05) percentage change for all topics except Human Resource Management and Marketing. It appears that learners are retaining knowledge obtained through the use of the modules used for academic leveling. By learning the fundamentals at the start of the master's program, learners may be able to learn the advanced concepts that are taught later in the program more effectively.
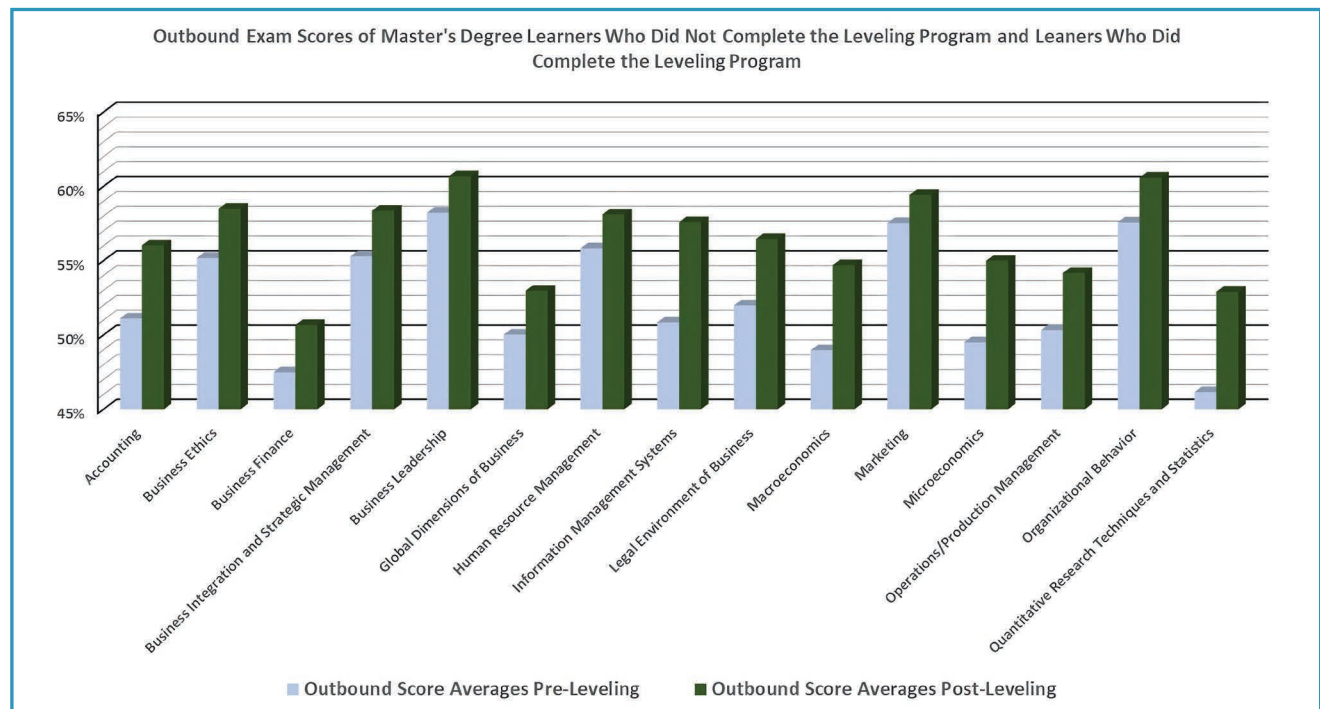

Figure 8. By Outbound Exam Topic, the Scores of Learners Who Did Not Complete the Leveling Program (N=5,864 Exams, Average = 52.40%) and Learners Who Did Complete the Leveling Program (N=8,589 Exams, Average Score = 56.41%).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The following conclusions, organized by the research questions, are based on the trend analyses and case studies.

1. How are the modules used for academic leveling valid and reliable?
   - Validity is based on how the modules were identified and created. The academic leveling program was developed in response to the accreditation requirements for graduate business education. Terminally degreed professors wrote the modules.
   - Reliability is based on the consistency of the results to produce the desired outcome. Based on the trends over time, learners are learning from the modules as expressed by the observed changes in the pre-test and post-test scores. Additionally, learners who complete the leveling modules at the start of the graduate business program tend to do better on their end-of-program Outbound Exam.

2. How are academic program managers using the Academic Leveling Modules, and what do the results indicate?
   - The two main approaches to academic leveling are (1) requiring learners to complete all the modules in the first course of the graduate business program and (2) having the learners complete selected academic leveling modules based on the learner's Inbound Exam results.
   - The selection of academic leveling modules is based on the learning outcomes of the graduate business program.
   - Learners see a percentage change of 80-150% based on the module pre-test and post-test scores.

3. What are the trends in learning through the use of Academic Leveling Modules?
   - Learners are seeing a percentage change of 80-150% based on the module pre-test and post-test scores.
   - Learners who complete the leveling modules at the start of the graduate business program tend to do better on the Outbound Exam.
   - Graduate-level learners who completed the leveling at the start of their graduate program tended to have higher retention rates in the program. Learners were more confident in the program, and graduation rates improved when leveling modules are used at the start of the graduate program.

4. Are learners learning by completing the modules used for academic leveling, as expressed through the difference between the pooled pre-test and post-test scores?
   - Learners are learning the module's instructional content. Pooled post-test scores are significantly higher than the pooled pre-test scores.

5. Are individual learners learning by completing the modules used for academic leveling as expressed by the difference between the paired pre-test and post-test scores?
   - Individual learners are learning the module's instructional content. Paired post-test scores are significantly higher than paired pre-test scores.

RECOMMENDATIONS

The following recommendations for program managers are offered based on the analysis of the academic leveling trends and the case studies.

1. Different approaches to academic leveling are valid and reliable. Learners can be required to complete all modules regardless of their Inbound Exam scores or complete selected modules based on the Inbound Exam scores.

2. Program managers should conduct trend analysis to understand how the academic leveling program affects learning during the graduate program and the results observed on the end-of-program Outbound Exam.

3. Module selection for an academic leveling program should be based on the program's learning outcomes.

4. Completing the leveling modules should be based on a minimum score of 60-80% for the module post-test. Grading based on post-test scores helps ensure that the learner is spending the appropriate amount of time studying and learning the instructional material. If a learner obtains a module pre-test score of 60-80% or higher, credit for the module can also be awarded.

5. Scores obtained for each topic on the Inbound Exam can be used to test-out of the modules. Such test-out scores are typically in the 50th percentile or higher.

6. Although the leveling modules are most often used for learners entering a business graduate program and do not have a business undergraduate degree, the leveling program can also help business undergraduate degreed learners perform better in the graduate program.

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Peregrine Global Services Corporation

P.O. Box 741

Gillette, WY 82717

307.685.1555

Info@PeregrineGlobal.com

www.PeregrineGlobal.com

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ACADEMIC LEVELING