

Comprehensive Business Exam®

A New Measure of Collegiate Business Education
TECHNICAL MANUAL



Technological Fluency Institute, Inc
FBLA-PBL, Inc.

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Comprehensive Business Exam® (4.0) TECHNICAL MANUAL

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Comprehensive Business Exam®

TECHNICAL MANUAL

Description

The Comprehensive Business Exam® 4.0 (CBE® 4.0) is a criterion-referenced exam that consists of 88 multiple-choice questions designed to assess the core business content knowledge of soon-to-graduate college seniors who will earn an undergraduate business degree. Each administration of the CBE also includes an additional four to 12 unscored items in development for future versions of the CBE. Students should ideally take the CBE during the semester of their graduation from a four-year college.

The CBE includes questions that cover 28 objectives within the following eight content domains:

- Accounting
- Finance
- Economic Environment
- Social Environment
- Legal Environment
- Management
- International Business
- Marketing

The 88-item Comprehensive Business Exam generally includes three multiple-choice items for each of the 28 objectives listed below. Because of the importance of the accounting function in business, four of the five objectives in the Accounting content domain use four items rather than the normal three to assess the student's knowledge. An additional four to 12 items on the CBE consist of unscored items that will be used to gather psychometric information on questions for future versions of the Exam.

The 28 general business content objectives assessed by the Comprehensive Business Exam include the following. The number of items assessing each particular objective is in brackets.

(1) Accounting

1. Identify the basic financial statements and their purposes, and explain their interrelationships. [4]
2. List the effects of transactions on the elements of the accounting equations and transaction analysis. [4]
3. Demonstrate an understanding of the content, concepts, structure, and meaning of reporting for organizational operations for external use. [3]
4. Identify and utilize sources of financial statement information of publicly traded companies. [4]
5. Demonstrate a fundamental understanding of accounting terminology. [4]

(2) Finance

6. Demonstrate an understanding of the valuation effects of each financial decision. [3]
7. Demonstrate an understanding of the risk-return relationship and its effects on decision making. [3]
8. Demonstrate the ability to access and use basic tools to calculate and measure financial outcomes. [3]
9. Identify the major financial statements of a corporation and indicators of good performance. [3]

(3) Economic Environment

10. Define terminology associated with economic environments in business (e.g., deficit, surplus, debt, market economy). [3]
11. Demonstrate an appreciation for basic economics issues, such as limitations of resources and the global impact of economic issues on business. [3]
12. Identify factors responsible for economic growth and the policies that impact long-run growth. [3]

(4) Social Environment

13. Identify ethical issues and choose the most ethical action. [3]
14. Demonstrate ethical and social responsibility in given business scenarios. [3]

(5) Legal Environment

15. Identify legal issues and legal risks in business decision making, including the substantive areas of torts, contracts, and sales law. [3]
16. Demonstrate knowledge and understanding of the basic concepts of the legal system such as the elements of a contract. [3]

(6) Management

17. Select the appropriate management action in a business scenario involving employee supervision/evaluation. [3]
18. Demonstrate an understanding of management and leadership and their differences. [3]
19. Describe and explain the manner in which all of the functional areas in business operate, emphasizing business management. [3]
20. Demonstrate an understanding of the other managers and the human resource management process. [3]
21. Identify how to make changes and organizational changes. [3]

(7) International Business

22. Demonstrate an understanding of current global business and future global business challenges. [3]

23. Demonstrate an understanding of the environments of global business and the importance of global business strategies. [3]
24. Demonstrate an understanding of the influences of political, economic, and cultural factors on the development of global business strategies. [3]

(8) Marketing

25. Identify components of the marketing mix. [3]
26. Demonstrate an understanding of the social/cultural; legal, political, and regulatory; economic; technological; and competitive environments on marketing products and services in a global society. [3]
27. Demonstrate an understanding of the synergistic effects of combining product, promotion (communication), price, and distribution decisions relevant to market opportunities and applying this understanding to the development of a marketing plan. [3]
28. Explain how consumers purchase and evaluate services. [3]

The Comprehensive Business Exam is completed online after logging into a secure, interactive online assessment system, E-SESS™, operated by Technological Fluency Institute (TFI). The CBE uses the same question format throughout the test: a question stem with four possible answer choices. The online system presents the items (88 scored items and four to 12 items in development for future versions of the CBE) in the same order for all test takers, but the order of the four answer choices for each item varies randomly.

Respondents have 1½ hours to complete the CBE. During initial beta testing sessions, most respondents required 30-60 minutes to complete the assessment.

The Comprehensive Business Exam yields a global score (number correct) and an overall proficiency rating for the exam as a whole.

The CBE also provides each test taker with a profile that shows the number correct and a proficiency level for each of the eight content domain subtests:

- Accounting
- Finance
- Economic Environment
- Social Environment
- Legal Environment
- Management
- International Business
- Marketing

In addition to the individual student reports, the Comprehensive Business Exam provides the sponsoring higher education institution with routine summary reports that compare the performance of its students to the performance of students from peer institutions.

These summary reports, generated by E-SESS™ and distributed by Technological Fluency Institute, Inc., compare the institution's student test scores with student

scores from peer institutions on the proficiency levels attained by students on each of the content domain subtests.

Purpose

The Comprehensive Business Exam provides a valid and reliable measure of the general business knowledge undergraduate students possess as they near graduation with a general business degree. The CBE is designed to assess the knowledge and concepts presented in the core courses required for an undergraduate degree in business.

Results from the Comprehensive Business Exam can provide important data for program review and improvement. Faculty and university administrators can use the CBE results to:

- Take stock of their business degree program by comparing the performance of their senior business majors to the performance of senior business majors at peer institutions,
- Judge the effectiveness of their program in preparing students,
- Document the change over time in students' knowledge of business content. Faculty can administer a pretest using the CBE to freshman/sophomore students who have declared a business major and then again as these students approach graduation,
- Track over time the performance of different cohorts of business majors,
- Prepare accountability documents for governing boards and accrediting agencies,
- Gauge what senior students have learned over the four years in their core business degree courses, and finally,
- Establish within their degree program a culture of accountability and evidence that uses data to drive decisions about program changes and improvements.

The Comprehensive Business Exam should NOT be used to make decisions concerning INDIVIDUALS. Decisions about individual faculty members or students that involve such activities as granting or withholding tenure and promotion of faculty, awarding merit pay, assigning performance appraisal ratings, granting or withholding entrance into undergraduate or graduate programs, granting or withholding a student's degree, or designating awards or special recognition of faculty/students should not be made using results from the CBE.

Development

The eight business content domains and 28 objectives that serve as the foundation for the items included in the Comprehensive Business Exam resulted from a nine-

month process that included business faculty throughout the United States. (See Appendix A for a list of the faculty who contributed to the development of the content domains and objectives.)

The process began with a review of business course objectives obtained from course syllabi submitted by business faculty at seven colleges (Goldey-Beacom College, International College, Nichols College, Oakland City University, University of the Ozarks, Urbana University, and Wayne State College). A panel of 24 business school experts then reviewed and ranked the relevancy of these objectives, using a standardized judgment form. Objectives with the highest ranking of relevancy were then submitted to a panel of seven additional business school experts for final review. This review process yielded 28 objectives divided into eight content domains.

Volunteer professors with expertise in specific content domains prepared multiple-choice items designed to measure the 28 objectives. Each of these potential items was then field-tested by college students within an online assessment environment. (See Appendix B for a listing of the institutions whose students participated in field-testing the items. Appendix C provides the background characteristics of the 595 graduating business students who took part in the most recent field-testing of items during Fall 2009 and Spring 2010.)

Psychometric analyses of discrimination and difficulty indices were run on the field-testing results using *Lertap5* software¹. The 88 items with the best difficulty and discrimination were then selected for inclusion in the Comprehensive Business Exam 4.0.

Test Validity and Reliability

Test validity and reliability are related, but they are very different concepts. Validity has to do with whether a test actually does what it purports to do, while reliability has to do with how consistently it does what it purports to do. For example, your home bathroom scale could be reliable but not valid. Each morning your scale might give your weight as 178 pounds. Assuming that your weight does not change, then it gives a reliable or consistent estimate of your weight. However, if your true weight (measured by your doctor's totally accurate scale) is actually 185 pounds, then your bathroom scale is not valid. It gives a consistently inaccurate measurement of your weight. In addition, there are several different types of reliability and validity.

Validity

Face Validity. This is the lowest level of validity. This is an opinion, based upon a simple review of the test items, made by laymen, users of the test, or even the test takers themselves, as to how well the test items look like they might measure

¹Lertap, the Laboratory of Educational Research Test Analysis Package, is a system for item, test, and survey analysis, now in its fifth version. Developed by Larry Nelson, PhD, Curtin University of Technology, Perth, Western Australia.

the desired characteristic (knowledge, skill, or ability). Face validity is not based upon any external criterion and cannot be regarded as empirical.

During the initial development of the items for the Comprehensive Business Exam, students, from Pittsburg State University, representing the target testing population took part in think-aloud sessions. During these sessions, the students talked aloud as they took the items, noting confusing wording and explaining why they selected their answers. Their feedback also provided a judgment as to how well the items appeared to measure their knowledge of business.

Furthermore, several different expert panels at various stages during development established the face validity of the Comprehensive Business Exam. Expert panels of college business school educators determined the eight content domains and 28 objectives within these content domains. In addition, another panel of experts reviewed the field-tested items to make sure the items appeared to measure the objectives.

Content Validity. This also is a judgment, specifically regarding how well the knowledge, skills, or abilities assessed by the test are a representative sample of the desired knowledge, skills, or abilities, i.e., to what degree does the test provide a representative sample of the desired knowledge, skills, or abilities. Content validity is not based upon any external criterion and cannot be regarded as empirical.

As with face validity, expert panels of college business school educators helped establish the content validity of the Comprehensive Business Exam. The selection of the eight content domains and 28 objectives that form the foundation of the CBE began with a review of business course objectives obtained from course syllabi submitted by business faculty at seven colleges. A panel of 24 business school experts then reviewed and ranked the relevancy of these objectives, using a standardized judgment form. Those objectives with the highest ranking of relevancy were then submitted to a panel of seven additional business school experts for final review. Volunteer professors with expertise in specific content domains prepared multiple-choice items designed to measure each of the 28 objectives

Construct Validity. This has to do with the underlying construct (knowledge, skill, or ability) that is being assessed and how well the test correlates with other tests of the same construct. Stated differently, construct validity asks whether there are any other explanations for variance in the scores other than true variations among the test takers in the amount of the particular knowledge, skill, or ability possessed. There is no single measure of construct validity. Construct validity is based on the accumulation of knowledge about the test and its relationship to other tests and behaviors. Construct validity is always important, but it is essential when there is no objective external criterion available.

Two analyses were conducted to establish the construct validity of the Comprehensive Business Exam.

- One would expect graduating senior business students with high GPAs in business courses to perform significantly better than their peers with low business GPAs. Statistical analysis on the test results from the Fall 2009-Spring 2010 field test showed that the high GPA business students scored significantly higher on the CBE than their low GPA counterparts ($t=9.09$, $df = 174$, $p<.0001$).
- Secondly, one would also expect that graduating business majors would outperform graduating non-business majors on the CBE. On the most recent field-testing that occurred during Fall 2009 and Spring 2010, statistical comparison of mean scores shows that business majors obtained a mean score of 60.97, while non-business majors obtained a mean score of 43.05, a difference that is significant well beyond the .0001 level. ($t = 9.71$, $df = 80$, $p<.0001$)

Concurrent Validity. This type of validity involves the degree to which a test score correlates with current performance on some other measure, either another measure of the same knowledge, skills, and abilities or (preferably) a specific external criterion.

Using results from the most recent field testing that involved 500 graduating business students, statistical analysis revealed a moderate positive correlation ($r = .44$) between students' Comprehensive Business Exam score and their self-reported GPAs in business.

Reliability

Reliability as it pertains to the Comprehensive Business Exam focuses on two questions:

(1) Is the test reliable and consistent within itself?

One way to assess internal consistency is to calculate the split-half reliability coefficient of the test. This statistical procedure calculates how well one-half of a test correlates with the other half. The procedure calculates all the different ways a test could be divided in half (first half/second half, odd items/even items, etc.) and renders a correlation coefficient that describes how well one-half of a test correlates to the other half. An internally reliable assessment should result in a correlation of .70 or better. The split-half reliability correlation for the Comprehensive Business Exam using data from the Fall 2009-Spring 2010 field-testing was calculated at .86, a level considered to be good (.70 to .79 = satisfactory, .80 to .89 = good, .90 or better = excellent).

(2) Does the test over time yield scores consistent with logical predictions?

The Comprehensive Business Exam is designed to measure specific business knowledge that students acquire over time during their degree program. Thus, we would logically expect that students who have not taken the core courses in a business degree program should score significantly lower than graduating business majors. Analysis from the beta testing confirms this. In addition to the 595 business majors who field-tested the Comprehensive Business Exam during Fall 2009 and Spring 2010, 73 non-business majors took the Exam. Statistical analysis showed that the business majors significantly outperformed the non-business majors ($t = 9.71$, $df = 80$, $p < .0001$).

Furthermore, in the near future a pretest/posttest design will be implemented: a group of incoming freshman business majors will take the Comprehensive Business Exam during their first semester of college enrollment. These same students will take the Exam again in the semester of their graduation with a business degree. One would expect that the students' senior scores would be significantly higher than their freshman scores, thus providing additional evidence of the Exam reliability.

Correlations among Domain Scores and with the Total Exam Scores

A high-quality assessment should show a positive correlation among various subtests, but not such high correlations as to blur the distinctions among the knowledge domains. In other words, the subtests on the assessment should individually tap into sufficiently different areas of knowledge.

Analysis of the results from the Fall 2009-Spring 2010 field-testing of the CBE shows that the CBE does have the desired positive relationships among the scores on the separate domains and the equally desirable differentiation among the subtests.

The mean intercorrelations for the eight domains on the CBE range from .23 to .59, while the mean correlation between the total score on the Exam and each of the eight domains also is positive and somewhat stronger at .65. (See Appendix E.)

Appendix F displays the correlations in a slightly different way giving the coefficients of determination for the correlations among the eight domains and between the content domains and the overall scores on the Comprehensive Business Exam. A coefficient of determination is calculated by squaring the correlation coefficient (r^2) and shows how much of the variation between the two variables overlaps. The coefficient of determination gives an indication of how well the score on one variable will predict the test taker's score on the second variable.

For example, the coefficient of determination between the Fall 2009-Spring 2010 pool scores on the Accounting domain and the Finance domain is $r^2 = .35$. This means that 35% of the variation between the scores in the two domains overlap and we would expect that 35% of the Finance score would be explained by the student's score on the Accounting domain. However, we must keep in mind that 65% of the student's score on the Accounting domain is explained by other factors, such as the student's knowledge of accounting.

General Procedures for Registration and Administration

Purchasing Seats for the Comprehensive Business Exam

The CBE is purchased by the seat. Each participating student will require a seat. Seats are non-refundable and expire one year from the date of purchase.

To purchase seats for the exam, send a purchase order/check/money order for the requested seats to:

Comprehensive Business Exam Administrator

Technological Fluency Institute, Inc.

P.O. Box 1922

Pittsburg, KS 66762

866-277-5061

620-231-1311 (fax)

Checks/money orders are payable to Technological Fluency Institute, Inc. Receipt of a purchase order constitutes an agreement to remit; therefore, seats will be active upon receipt of the purchase order. For credit card purchases, please call 866-277-5061.

All orders should include the number of seats needed, a designated testing window (optional), the full institution name, and the contact information for the proctor or staff member responsible for administering the Comprehensive Business Exam.

Upon receipt of the purchase order/check/money order, the CBE Administrator will contact the proctor or staff member and will distribute password/login information, proctor information, and a data collection form. Communication will be via e-mail and/or telephone.

Taking/Giving the Comprehensive Business Exam

A certified on-site proctor (provided by the academic institution) will distribute generic user IDs to students. The proctor must verify the identity of test takers using government-issued identification. In the testing environment, students will complete demographic information, including updating the name fields, and then advance to the assessment. The proctor will time the administration, allowing students 1½ hours to complete the CBE.

At the end of the designated testing window, the proctor shall notify the CBE Administrator that the site has concluded testing. The proctor also will complete the data collection form, which is a request for the GPA of each participant as authorized by the student and verified by the institution's registrar or authorized staff. The proctor shall submit the completed data collection form to the CBE Administrator via U.S. Postal Service.

Scoring and Interpretation of Results

The Comprehensive Business Exam scores the test by reporting the number correct out of the 88 scored items. An additional four to 12 additional items on the Exam consist of questions in development for future versions and are not included in the student's score.

The CBE yields a global score (number correct) and an overall proficiency rating for the exam as a whole. The overall proficiency rating is determined by the number of domains a student attains proficient or higher. The table below shows the proficiency levels for the overall exam.

Overall Mastery	7 or 8 domains are "proficient" or higher
Overall Proficient	6 domains are "proficient" or higher
Overall Basic	4 or 5 domains are "proficient" or higher
Overall Not Proficient	0, 1, 2, or 3 domains are "proficient" or higher

The CBE also provides each test taker with a profile that shows the number correct and the proficiency level on each of the eight content domain subtests:

- Accounting
- Finance
- Economic Environment
- Social Environment
- Legal Environment
- Management
- International Business
- Marketing

The table below shows the proficiency levels for the individual domains:

Mastery	100% of the items in the domain correct
Proficient	83%-99% of the items in the domain correct
Basic	66%-82% of the items in the domain correct
Not Proficient	below 66% of the items in the domain correct

Immediately after submitting the CBE, the individual test taker will see a screen showing a profile report similar to one shown below.

Standard	Correct	Percent Correct	Proficiency
Domain: Accounting	16 out of 19	84.21 %	Proficient
Domain: Finance	7 out of 12	58.33 %	Not Proficient
Domain: Economic Environment	7 out of 9	77.78 %	Basic
Domain: Social Environment	5 out of 6	83.33 %	Proficient
Domain: Legal Environment	5 out of 6	83.33 %	Proficient
Domain: Management	13 out of 15	86.67 %	Proficient
Domain: International Business/Global Dimensions	8 out of 9	88.89 %	Proficient
Domain: Marketing	11 out of 12	91.67 %	Proficient
Overall Proficiency	6 out of 8		Proficient

Individual Profile Report

FBLA-PBL, Inc./TFI, Inc. will maintain a record of test takers' scores and answer data for a period of one year before purging the information from the database.

Institutional Reports

The Comprehensive Business Exam provides the sponsoring higher education with the following standard reports:

- Individual Student Report (disaggregated) with raw data and percentages by domain and objective.
- Comparison Report to Business Seniors at Peer Institutions. While the pool of participant data is being initialized, institutions may receive a comparison report of its students performance on the CBE 4.0 as compared to peer institution performance on the CBE Beta 1.3 exam.
- Overall Proficiency (disaggregated)

These reports are distributed after the CBE Administrator receives the completed forms from the exam administration as documented in the CBE Proctor Guide. For an additional fee, institutions may request these reports at any time, within one calendar year, after its students complete the CBE.

Furthermore, sponsoring institutions may request, at no additional charge, the following additional reports:

- Summary of Assessment Statistics – descriptive statistics (mean, median, mode, standard deviation, interquartile range, and range) for the institution group's total score on the Exam.
- Aggregated Proficiency – percentage of students who score at each of the proficiency levels (Mastery, Proficient, Basic, Not Proficient) within each of the eight domains.
- Objective Percentage – percentage of students who get each objective correct.
- Comparison Report to Total Population – compares students' performance to that of the total testing population.
- Testing Roster – student name, testing date and raw score.

All reports will be distributed via e-mail at no charge to the institution. If the institution requires a written report, additional fees will apply. Fees are based on the specific report requested and cover printing and postage.

FBLA-PBL, Inc./TFI, Inc. will maintain a copy of institutional reports for five years before purging the information from the system.

Testing Conditions

Respondents may take the Comprehensive Business Exam individually or in a group setting, with a proctor monitoring the testing environment. Test takers have 1½ hours without any breaks to complete the 88 scored items and the four to 12 unscored items in development for future versions of the CBE.

Testing Format

The Comprehensive Business Exam is offered as an online assessment only (exceptions are made for students with disabilities). Test takers complete the CBE online after logging into a secure interactive online assessment system, E-SESS™, operated by Technological Fluency Institute (TFI). The CBE uses the same question format throughout the test: a question stem with four possible answer choices. The online system presents the 88 items in the same order for all test takers, but the order of the four answer choices for each item varies randomly.

Respondents may review and change their answers during the Exam. However, when they click the “Done” button, their testing session ends.

System Requirements

The testing program is best viewed using Internet Explorer 7.0+ or Firefox 3.0+. The program should work in the current version of other browsers (such as Chrome and Safari), but these browsers are not supported by TFI.

The program will work at 800 x 600 or higher resolution, but is best viewed at 1024 x 768 resolution. **The resolution should be set before students log into the testing program.** Further, the testing program will work on machines with Pentium II 450 or higher (or equivalent). Thus, institutions should administer the CBE on the fastest machines available with the best Internet connection.

The bandwidth recommendation is a T1 line for every 150 simultaneous users. The T1 may be able to serve additional students; however, student populations greater than 150 per site have not been tested and confirmed by TFI.

Contact Information

For additional information about the Comprehensive Business Exam contact:

CBE Administrator
Technological Fluency
Institute, Inc.
P. O. Box 1922
Pittsburg, KS 66762
866-277-5061
620-231-1311 (fax)

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Sponsoring Agency

The Comprehensive Business Exam is sponsored by Future Business Leaders of America-Phi Beta Lambda. The CBE was developed as a joint venture of Future Business Leaders of America-Phi Beta Lambda, Inc., Pitsco, Inc., and Technological Fluency Institute, Inc.

Testing for Individuals with Disabilities

Accommodations are provided for the Comprehensive Business Exam for test takers with disabilities. Those with visual impairment or learning disabilities may request to take the Exam in a large-print version or may request a reader. Furthermore, test takers with disabilities may request additional time to take the Exam. Additional time will be determined by the Comprehensive Business Exam Administrator. Request should be submitted in writing to Comprehensive Business Exam Administrator one month prior to taking the Exam.

Submit requests to:

Comprehensive Business Exam Administrator
Technological Fluency Institute, Inc.
P. O. Box 1922
Pittsburg, KS 66762

Confidentiality

Scores of individual test takers are confidential and reported only to the individual test taker and the academic institution that purchased the assessment seats. The staff and faculty of institutions are cautioned to treat the individual test scores with the same confidentiality they would use with students' grades.

Reports showing comparative data across institutions will never include scores of individual test takers. Rather, such reports will present only aggregated data. Furthermore, data for a particular academic institution also will be confidential. Only reports to the academic institution itself will identify the institution. Reports showing institutional comparative data will display the results sorted by Carnegie classifications unless FBLA-PBL and/or TFI receives authorization from the institution to reveal the identity of the institution.

References

- Bok, D. (2006). *Our underachieving colleges: A candid look at how much students learn and why they should be learning more*. Princeton, NJ: Princeton University Press.
- Dwyer, C. A., Millett, C. M., & Payne, D. G. (2006). *A culture of evidence: Postsecondary assessment and learning outcomes recommendations to policymakers and the higher education community*. Princeton, NJ: Educational Testing Service.

Appendix A: Faculty Who Participated in Development

Those who contributed to the initial catalog of objectives:

- Dr. Libba G. Moore, Associate Dean of Business, Professor of Political Science and Public Administration, Nichols College
- Dr. Fred Nerone, Dean, School of Business, International College
- Dr. Vaughn L. Benson, Dean, School of Business & Technology, Wayne State College
- Dr. Robert C. Hilton, Business Division Chair and Professor of Business, University of the Ozarks
- Alison Boord White, MBA, Academic Dean, Goldey-Beacom College
- Dr. John P. Thomas, MBA Program Director, Urbana University
- Dr. Darrin Sorrells, Dean, School of Business, Oakland City University

Those who helped narrow the initial catalog of objectives to the final 28 objectives:

- Dr. Douglas M. Abbott, Dean, College of Humanities, Social Sciences, and Information Technology, Montana Tech
- Linda Bernstein, Assistant Chairperson & Professor, Hilbert College
- Dr. John Bethune, Professor of Economics; Dean, School of Business; Kennedy Chair of Business, Barton College
- Dr. Patricia Buhler, Associate Professor, Goldey-Beacom College
- Dr. Gregory Chase, Associate Professor of Economics, Brenau University
- John R. Chism, Professor of Management, Greenville College
- Dr. Linda Cresap, Dean, Graduate School & Research/Sponsored Programs, Minot State University
- Dr. Curtis L. DeBerg, Professor, California State University, Chico
- Dr. Todd Drew, Dean, School of Professional Studies, Peru State
- Dr. Jeannette Eberle, Business Chair, Professor of Finance, Webber International University
- Julianne Eklund, M.S., Minot State University
- Ronald W. Ferner, MBA, Dean, School of Business and Leadership, Philadelphia Biblical University
- Elizabeth Fletcher, Associate Professor of Business, Evangel University
- Dean A. Frantsvog, J.D., Assistant Professor of Law, Minot State University
- Dr. Randy Frye, Professor of Business Administration & Business Administration Department Chair, St. Francis University
- Dr. Jan Hansen, Graduate Business Programs, School of Business, Benedictine College

- Rob Harris, Associate Professor, Brenau University
- Dr. Randy Hilton, Baum Professor of Marketing, University of the Ozarks
- Dr. Robert C. Hilton, Business Division Chair and Professor of Business, University of the Ozarks
- James A. Kimbell, Jr., Professor of Business Administration & Chair, Department of Business Administration, Coker College
- Dr. Shashi Kumar, Associate Dean/Professor of International Business & Logistics, Maine Maritime Academy (Loeb-Sullivan School)
- Chris Lawrey, Assistant Professor of Business Administration, Williams Baptist College
- Dr. Deborah Leitsch, Associate Professor, Goldey-Beacom College
- Dr. Linda Mast, Associate Dean, Robert Morris College
- Dr. Frank Moseley, Assistant Professor of Finance, Minot State University
- Dr. Anthony N. Negbenebor, Dean of the Godbold School of Business, Professor of Economics and International Business, Gardner-Webb University
- Dr. James Ondracek, Business Administration Department, Minot State University
- Dr. Jeffrey G. Reed, Dean, Marian University
- Deborah Reed Scarfino, MA, Assistant Professor of Business Administration and Computer Studies, William Jewell College
- Dr. Kim Rocha, Assistant Professor, Barton College
- Dr. Robert H. Roller, Professor of Management and Dean, School of Business, LeTourneau University
- Dr. Gary Ross, Interim Dean (College of Business) and Professor of Management, Minot State University
- Dr. Todd Schultz, Professor of MIS, Augusta State University
- Dr. Kelli Schutte, Assistant Professor of Business Administration, William Jewell College
- Dr. Brian Simpson, Assistant Professor, National University
- Dr. William Teng, Dean, School of Business and Economics, King College
- Dr. Jeff Tschetter, Associate Professor of Business, University of Sioux Falls
- Dr. Lorraine (Lori) J. Willoughby, MSIS/MED-Business Program Director, Minot State University
- J. Douglas Wellington, J.D., LL.M., Assistant Professor, Husson College
- Dr. Carolyn Youssef, Assistant Professor, Bellevue University

Those who contributed items for possible inclusion in the Comprehensive Business Exam

- Ellen Benowitz, Faculty, General Business; Coordinator, Banking and Business Management; Mercer County Community College
- Barry T. Brown, Lecturer in Economics, Murray State University
- Dr. Patricia Buhler, Associate Professor, Goldey-Beacom College
- Dr. Linda Cresap, Dean, Graduate School & Research/Sponsored Programs, Minot State University
- Dr. Curtis L. DeBerg, Professor, California State University, Chico
- Dr. Jeannette Eberle, Business Chair, Professor of Finance, Webber International University
- Dean A. Frantsvog, J.D., Assistant Professor of Law, Minot State University
- Dr. M. Margaret Galligan, Associate Professor and Chair, Department of Business Administration, Shepherd University
- Pradeep Ghimire, Instructor of Business Administration, Palo Alto College
- Dr. Mary Goebel-Lundholm, Assistant Professor of Business, Peru State University
- Dr. Christy L. Hutchison, J.D., Assistant Professor of Business, Peru State University
- Ken Kaser, Sugar Land Program Director and Recruiter, Conrad N. Hilton College of Hotel and Restaurant Management
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- Dr. Douglas Nay, Professor Of Management , Edison State College
- Mr. Robert Wofford, Associate Professor of Economics & Business, University of the Ozarks

Appendix B: Institutions that Participated in Field-Testing Items

Institutions that participated in the Fall 2009-Spring 2010 Field-Testing:

- Albertus Magnus College (Connecticut)
- Aquinas College (Tennessee)
- Belhaven Houston (Mississippi)
- Belhaven Jackson (Mississippi)
- Belhaven Orlando (Mississippi)
- Benedictine College (Kansas)
- Culver Stockton College (Missouri)
- Cumberland University (Tennessee)
- Dakota State University (South Dakota)
- Edison College (Florida)
- Elms College (Massachusetts)
- Hannibal LaGrange College (Missouri)
- Holy Family University (Pennsylvania)
- International University of Vienna (Austria)
- Midland Lutheran College (Nebraska)
- Minot State University (North Dakota)
- Morningside College (Iowa)
- Oakland City University (Indiana)
- Olivet College (Michigan)
- Presentation College (South Dakota)
- Southwestern Oklahoma State University (Oklahoma)
- Springfield College (Massachusetts)
- St. Thomas Aquinas College (New York)
- The American Business School Paris (France)
- The University of Montana Western (Montana)
- Trevecca Nazarene (Tennessee)
- University of Guam (Guam)
- University of Mary (North Dakota)
- University of North Alabama (Alabama)
- University of Northern Iowa (Iowa)
- University of the Ozarks (Arkansas)
- Upper Iowa University (Iowa)

- Wayne State College (Nebraska)
- Webber International University (Florida)
- William Carey University (Mississippi)
- Williams Baptist College (Arkansas)
- Medium, Western Four-Year Baccalaureate College*
- Large, Western Four-Year Master's College*

*Name withheld pending consent from institution

Institutions that participated in prior field-testing of CBE items:

- Albertus Magnus College (Connecticut)
- American International College (Massachusetts)
- Barton College (North Carolina)
- Belhaven College (Mississippi)
- Blue Mountain College (Mississippi)
- Carthage College (Wisconsin)
- Cumberland University (Tennessee)
- Elms College
- Evangel University (Missouri)
- Franklin University (Ohio)
- Hannibal LaGrange College (Missouri)
- Herzing University (Wisconsin)
- Holy Family University (Pennsylvania)
- International University Geneva (Switzerland)
- International University of Vienna (Austria)
- Jamestown College (North Dakota)
- Lourdes College (Ohio)
- McKendree College (Illinois)
- Minot State University (North Dakota)
- Morningside College (Iowa)
- Nichols College (Massachusetts)
- Oakland City University (Indiana)
- Philadelphia Biblical University (Pennsylvania)
- Pittsburg State University (Kansas)
- Presentation College (South Dakota)
- Roberts Wesleyan College (New York)

- Salve Regina University (Rhode Island)
- Southeastern University (Florida)
- St. Thomas Aquinas College (New York)
- SUNY Potsdam (New York)
- SBS Swiss Business School (Switzerland)
- The American Business School Paris (France)
- The University of Montana Western (Montana)
- Thomas University (Georgia)
- Toccoa Falls College (Georgia)
- University of Guam (Guam)
- University of Mary (North Dakota)
- University of the Ozarks (Arkansas)
- Webber International University (Florida)
- William Carey University (Mississippi)
- Very Small, Southern Four-Year Baccalaureate College*
- Very Small, Midwestern Four-Year Baccalaureate College*
- Small, Western Four-Year Baccalaureate College*
- Small, Southern Four-Year Master's College*
- Medium, Midwestern Four-Year Master's College*
- Medium, Northeastern Four-Year Master's College*
- Medium, Southern Four-Year Master's College*
- Large, Western Four-Year Master's College*

*Name withheld pending consent from institution

Appendix C: Description of Senior Business Major Students Who Participated in the Most Recent Field-Testing

Table 1: Fall 2009/Spring 10: Distribution of Students Who Participated in the Field Testing: By Academic Institution

Academic Institution	# of Students	% of Total
Albertus Magnus College	24	4.0%
The American Business School Paris	7	1.2%
Aquinas College	3	0.5%
Belhaven Houston	11	1.8%
Belhaven Jackson	8	1.3%
Belhaven Orlando	5	0.8%
Benedictine College	8	1.3%
Culver Stockton College	27	4.5%
Cumberland University	32	5.4%
Dakota State University	5	0.8%
Edison College	11	1.8%
Elms College	8	1.3%
Hannibal LaGrange College	9	1.5%
Holy Family University	2	0.3%
International University of Vienna	6	1.0%
Medium, Western Four-Year Baccalaureate College*	1	0.2%
Midland Lutheran College	17	2.9%
Minot State University	16	2.7%
Morningside College	13	2.2%
Large, Western Four-Year Master's College*	18	3.0%
Oakland City University	9	1.5%
Olivet College	17	2.9%
Presentation College	9	1.5%
Southwestern Oklahoma State University	22	3.7%
Springfield College	29	4.9%
St. Thomas Aquinas College	18	3.0%
The University of Montana Western	12	2.0%
Trevecca Nazarene	13	2.2%
University of Guam	30	5.0%
University of Mary	49	8.2%
University of North Alabama	11	1.8%
University of Northern Iowa	3	0.5%
University of the Ozarks	13	2.2%
Upper Iowa University	7	1.2%
Wayne State College	83	13.9%
Webber International University	27	4.5%
William Carey University	8	1.3%
Williams Baptist College	4	0.7%
TOTAL	595	

*Name withheld pending consent from institution

Table 2: Fall 2009/Spring 2010: Carnegie Classification of Institutions That Participated in the Field Testing

Carnegie Classification of Institution	# of Students	% of Total
Associate's Colleges	11	1.85%
Baccalaureate Colleges	171	28.74%
Doctoral/Research Universities	13	2.18%
Master's Colleges and Universities	324	54.45%
Special Focus Institutions	49	8.24%
No classification info available	27	4.54%
TOTAL	595	

Table 3: Age and GPA Information for Fall 2009-Spring 2010 Field-Testing Participants

Background Characteristics	Mean	Standard Deviation	Median	Range	n
Age at Testing	24.5	6.61	22	46 (19-65)	595
GPA Overall at Testing	3.29	0.5	3.23	2.01 (1.99-4)	514
GPA in Major	3.27	0.5	3.3	2.1 (1.9-4)	500

Table 4: Business Credit Hours Completed by Fall 2009-Spring 2010 Field-Testing Participants

Business Credit Hours Completed	Count	%
48 to 60 hours	260	43.70%
over 60 hours	335	56.30%
TOTAL	595	100.0%

Table 5: Gender of Fall 2009-Spring 2010 Field-Testing Participants

Gender	Frequency	%
Male	328	55.13%
Female	267	44.76%
TOTAL	595	100.0%

Table 6: Race/Ethnicity of Fall 2009-Spring 2010 Field-Testing Participants

Race/Ethnicity	Frequency	%
Asian	31	5.21%
Black	48	8.07%
Caucasian	415	69.75%
Decline	17	2.86%
Hispanic	40	6.72%
Native American	5	0.84%
Other	39	6.55%
TOTAL	595	

Table 7: Business Major for Fall 2009-Spring 2010 Field-Testing Participants

Major	Frequency	%
Accounting	85	15.57%
Business Administration	132	24.18%
Business Management	119	21.79%
Marketing	58	10.62%
Finance and Economics	53	9.71%
International Business	14	2.56%
Human Resources	11	2.01%
General Business	67	12.27%
Sport Marketing-Management	7	1.28%
TOTAL	546	100.00%

Table 8: Part-time Attendance Information of Fall 2009-Spring 2010 Field-Testing Participants

Attend Part-time in Last 2 Years?	Frequency	%
No	537	90.3%
Yes	58	9.7%
TOTAL	595	100.0%

Table 9: Business Internship Information for Fall 2009-Spring 2010 Field-Testing Participants

Business Internship Completed?	Frequency	%
No	407	68.75%
Yes	174	29.39%
No Response	11	1.86%
TOTAL	592	

Table 10: Duration of Completed Internship for Fall 2009-Spring 2010 Field-Testing Participants

Duration of Completed Internship	Frequency	%
1 to 4 Months	106	17.91%
5 or More Months	45	7.60%
Less than 120 Hours	2	0.34%
120 to 300 Hours	19	3.21%
More Than 300 Hours	2	0.34%
No Internship	407	68.75%
No Useable Response	11	1.86%
TOTAL	592	

Table 11: Job Offers for after Graduation for Fall 2009-Spring 2010 Field-Testing Participants

Job Offer after Graduation	Frequency	%
Yes	108	18.15%
No	322	54.12%
No Response (or N/A)	165	27.73%
TOTAL	595	

Table 12: Accepted Post-graduation Job Offers for Fall 2009-Spring 2010 Field-Testing Participants

Accepted Job Offer?	Frequency	%
Yes	78	13.11%
No	82	13.78%
No Response (or N/A)	435	73.11%
TOTAL	595	

Table 13: Annual Salary of Post-graduation Job Offers for Fall 2009-Spring 2010 Field-Testing Participants

Annual Salary of Job Offer	Frequency	%
under \$30,000	16	2.69%
\$30-34,999	28	4.71%
\$35-39,999	14	2.35%
\$40-44,999	17	2.86%
over \$50,000	16	2.69%
N/A	504	84.71%
TOTAL	595	

Appendix D: Analysis of Scores from the Fall 2009-Spring 2010 Beta Testing

Table 14: Scores for Fall 2009-Spring 2010 Participant Pool: Descriptive Statistics

Total Test	Mean	Standard Deviation	# of items	Reliability Coefficient
Overall # right	60.97	10.34	88	0.86
n=595				

Table 15: Fall 2009-Spring 2010 Field-Testing Scores by Content Domains

Content Domains	Mean	Standard Deviation	# of items	Reliability Coefficient
Accounting	11.69	3.70	19	0.73
Finance	6.61	2.19	12	0.50
Economic Environment	5.70	1.64	9	0.36
Social Environment	3.94	1.36	6	0.34
Legal Environment	4.57	1.11	6	0.22
Management	11.92	1.99	15	0.47
International Business	6.77	1.61	9	0.50
Marketing	9.77	1.73	12	0.54
n = 595				

Table 16: Fall 2009-Spring 2010 Field-Testing Scores by Institution Carnegie Classification

	Baccalaureate Colleges		Master's Colleges and Universities		Other Institutions*	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Overall # right	59.29	10.58	61.53	9.62	62.79	12.18
	n = 171		n = 324		n = 73	
* Associate's Colleges, Doctoral/Research Universities, Special Focus Institutions						

Table 17: Fall 2009-Spring 2010 Field-Testing Scores by Institution Carnegie Classification and Content Domains

Content Domains	Baccalaureate Colleges		Master's Colleges and Universities		Other Institutions*	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Accounting	11.23	3.87	11.76	3.54	12.34	3.75
Finance	6.35	2.21	6.58	2.13	7.32	2.25
Economic Environment	5.45	1.59	5.83	1.57	5.82	2.03
Social Environment	3.69	1.39	4.02	1.30	4.16	1.40
Legal Environment	4.44	1.10	4.66	1.09	4.59	1.15
Management	11.84	2.10	12.07	1.87	11.70	2.21
International Business	6.51	1.58	6.84	1.58	7.12	1.69
Marketing	9.78	1.59	9.76	1.69	9.74	2.04
	n = 171		n = 324		n = 73	

* Associate's Colleges, Doctoral/Research Universities, Special Focus Institutions

Table 18: Fall 2009-Spring 2010 Field-Testing Scores by Gender

Content Domains	Male		Female	
	Mean	Standard Deviation	Mean	Standard Deviation
Overall # right	61.13	10.21	60.77	10.55
Accounting	11.66	3.57	11.73	3.86
Finance	6.70	2.09	6.49	2.31
Economic Environment	5.74	1.58	5.65	1.72
Social Environment	3.98	1.37	3.90	1.35
Legal Environment	4.57	1.11	4.58	1.11
Management	11.85	2.02	12.00	1.96
International Business	6.86	1.53	6.66	1.69
Marketing	9.78	1.86	9.76	1.57
	n = 328		n = 267	

Table 19: Descriptive Statistics by Content Domains from Fall 2009-Spring 2010 Field-Testing

	Accounting	Finance	Economic Environment	Social Environment	Legal Environment	Management	International Business	Marketing	TOTAL TEST
n	595	595	595	595	595	595	595	595	595
Minimum score attained	1.00	1.00	0.00	0.00	1.00	4.00	1.00	0.00	22.00
Median	12.00	7.00	6.00	4.00	5.00	12.00	7.00	10.00	62.00
Mean	11.69	6.61	5.70	3.94	4.57	11.92	6.77	9.77	60.97
Max score attained	19.00	12.00	9.00	6.00	6.00	15.00	9.00	12.00	83.00
Standard deviation	3.70	2.19	1.64	1.36	1.11	1.99	1.61	1.73	10.34
Variance	13.67	4.80	2.69	1.84	1.23	3.97	2.58	2.99	106.99
Range	18.00	11.00	9.00	6.00	5.00	11.00	8.00	12.00	61.00
Interquartile range	5.00	3.00	2.00	2.00	1.00	2.00	2.00	2.00	13.00
Skewness	0.04	0.13	-0.23	-0.38	-0.54	-0.83	-0.87	-1.47	-0.48
Kurtosis	-0.63	-0.35	-0.14	-0.43	-0.29	0.71	0.56	3.92	0.16
Minimum Possible	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum Possible	19.00	12.00	9.00	6.00	6.00	15.00	9.00	12.00	88.00

Appendix E: Correlations among the Domain Scores with the Total Test Scores

Table 20: Correlations among the Domain Scores and with the Total Test Scores for Fall 2009-Spring 2010 Field-Testing Pool

Correlations Among Domains	Accounting	Finance	Economic Environment	Social Environment	Legal Environment	Management	International Business	Marketing
Accounting								
Finance	0.59							
Economic Environment	0.34	0.36						
Social Environment	0.31	0.32	0.31					
Legal Environment	0.32	0.26	0.32	0.30				
Management	0.39	0.35	0.35	0.39	0.35			
International Business	0.40	0.38	0.37	0.35	0.36	0.47		
Marketing	0.27	0.23	0.24	0.29	0.28	0.48	0.40	
TOTAL TEST	0.80	0.72	0.60	0.57	0.54	0.70	0.68	0.57

Appendix F: Coefficients of Determination among the Domain Scores with the Total Test Scores

Table 21: Coefficients of Determination among the Domain Scores with the Total Test Scores for Fall 2009-Spring 2010 Field-Testing Pool

Coefficients of Determination (r^2)	Accounting	Finance	Economic Environment	Social Environment	Legal Environment	Management	International Business	Marketing
Accounting								
Finance	0.35							
Economic Environment	0.11	0.13						
Social Environment	0.10	0.10	0.10					
Legal Environment	0.10	0.07	0.10	0.09				
Management	0.15	0.12	0.12	0.15	0.12			
International Business	0.16	0.14	0.14	0.12	0.13	0.22		
Marketing	0.07	0.05	0.06	0.08	0.08	0.23	0.16	
TOTAL TEST	0.63	0.51	0.35	0.32	0.29	0.50	0.46	0.33