Assurance of Learning, "Closing the Loop":
Utilizing a Pre and Post Test for Principles of Finance

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ABSTRACT

Since there is no standard national Pre and Post Test for Principles of Finance, akin to the one for Economics, by authors created one by selecting questions from previously administered examinations. The Cronbach's Alpha of 0.851, exceeding the minimum of 0.70 for reliable pen and paper test, indicates that our Test can detect differences in learning outcomes. Improvements between Pre and Post Test scores, statistically significant at the 1% level, in the entire sample and within different sections, points out that learning did occur. Demographical and pedagogical variables, expected to influence students' learning, were analyzed in order to identify the determinants of the Test scores. Significant positive correlation between test scores and grades from Accounting, Economics, College Algebra, SAT scores and college QPA suggest those good students, with good math skills and did well in the prerequisites, have substantially better foundations for Principles of Finance. Significant negative correlations between test scores and the number of terms since finishing high school indicate the difficulties of students whose progress through higher education was neither continuous nor orderly or smooth. Analysis of variance (ANOVA) indicates that mean pre test scores were significantly different for students in quantitative versus non-quantitative majors, but that there was no significant difference in post test score means. While the mean pre test scores were almost identical ANOVA showed statistically lower post test score for female and transfer students, suggesting that they need additional help and/or different teaching methods. In addition to providing instructor feedback, the findings from the test were used to change the School of Business undergraduate curriculum, by adding College Algebra to the prerequisites for Principles of Finance.

Keywords: finance pre and post test, additional prerequisites, gender differences, closing pre test performance gap, curriculum change procedure.

INTRODUCTION

The School of Business at Robert Morris University is expected to successfully complete the Association to Advance Collegiate School of Business (AACSB) accreditation process in early 2009. Regardless of the AACSB requirement to measure and report on the assurance of student learning (Suskie 2004), the faculty and administration in the School of Business, recognize the importance and the benefits of continuously assessing students' learning and have been actively implementing assessment tools across the business curriculum. The purpose of assessing learning at Robert Morris' Business School is viewed as being twofold. The first is to determine if students learn what was promised to them. The second is to close the assurance of learning loop by continuously improving our teaching methods and techniques, and making necessary changes in the School's curriculum, which is exactly what happened based on the results from this paper.

While a standard national Pre and Post Test for Economics has been regularly used by our faculty over the last several years, no such tool exists for Principles of Finance. Relying on results from the discipline based research [Cooley & Heck (1996), Michlitsch & Sidle (2002)], the Pre and Post Test for Principles of Finance was designed using 35 multiple choice questions from exams previously administered by authors. The test was first administered at the beginning and the end of the 2006 spring term in five sections of the Principles course. To prevent intentional underperformance on the pre test in order to ensure improvements on the post test, between 0.25% and 1.25% of the final grade was based on the scores in the pre and post test.

The reliability analysis of the test was performed using Cronbach's Alpha. Coefficient of 0.851 exceeded the minimum of 0.70 for reliable pen and paper test, suggesting that the Test is internally consistent and can be used to detect progress in learning. Although lacking the performance comparison at the National level or historical perspective at the school level, t-tests statistically significant at the 1% level for paired differences between the Pre and Post Test scores, in the entire sample and in different sections, indicates that learning did occur.

Overall, students showed the most improvement in the high-order questions involving calculations, followed by the low-order questions based on the recognition of definitions. The least progress occurred in the high-order questions requiring analysis and application of definitions. Consistent with Principles of Finance being the first finance class and its emphasis on capital budgeting, students showed the greatest improvement on questions dealing with the introductory material covering the characteristics of the corporations, followed by the investment criteria and the time value of money calculations. The least progress occurred regarding the risk/return tradeoff and capital asset pricing model, which was not surprising given the difficulty and introductory treatment of that material, revisited exhaustively in the investments course.

Significant positive correlation between Test scores and grades from Accounting, Economics, College Algebra, college QPA and SAT scores suggest good students, with good math skills, who did well in the prerequisites, have substantially better foundations for Principles of Finance. Significant negative correlations between Test scores and the number of terms since finishing high school indicate the difficulties of students whose progress through higher education was neither continuous nor orderly. Analysis of variance (ANOVA) indicates significantly higher mean Pre Test scores for students in quantitative than in non-quantitative majors, but no significant difference for Post Test score means. While the mean Pre Test scores were almost identical, ANOVA showed statistically smaller Post Test score for female and transfer students, suggesting that they need additional help and/or different teaching methods.

The rest of the paper is organized in the following way. After describing the general demographic and pedagogical characteristics of the sample, the design of the test is presented. A discussion of the analysis of the Pre and Post Test scores follows along with their correlations with the grades from prerequisite courses and other determinants of students' learning, with special attention given to differences in the scores based on gender, type of student (transfer vs. students admitted as freshmen to Robert Morris University), and type of major (quantitative vs. non-quantitative). The process of using test results to close the assurance of learning loop, by including College Algebra as a prerequisite for Principle of Finance is described next. Concluding remarks are provided at the end of the paper.

DATA

With the exception of the number of hours worked per week, which was self-reported, the demographic and pedagogical figures are based on official Robert Morris University data. Demographic characteristics of the sample, presented in Table 1, show similarities between Day 1 and Day 2 classes and between Partially-On-Line (POL) and Evening 2 classes, while the Evening 1 class, skewed by 23% of pre-MBA students, was different in terms of age, the number of terms since finishing high school, course load, as well as percentage of full time and transferred students. Although the similarities between other classes are absent for number of terms since starting college, work load and gender, Evening 1 class is still noticeably different.

Table 1: General Demographic Characteristics of the Sample

Variable	Section					Total
	Day 1	Day 2	Evening 1	Evening 2	POL	
Enrolled	36.00	29.00	15.00	27.00	20.00	129.00
Tested	36.00	21.00	13.00	21.00	20.00	111.00
Age	21.86	22.43	27.15	23.19	23.15	23.07
% Males	61.11	61.90	30.77	66.67	35.00	54.05
Finished HS Terms Ago	9.82	12.00	23.88	12.33	14.95	12.85
Started College Terms Ago	7.25	5.24	10.60	7.43	6.45	7.07
Hours Worked Weekly	20.61	21.67	40.62	19.14	28.65	24.30
Current Term Credits	14.50	14.00	7.15	13.43	11.85	12.87
% Full Time Students	94.44	100.00	7.69	85.71	85.00	81.98
% Transfer Students	30.56	47.62	53.85	57.14	60.00	46.85

Pedagogical characteristics are presented in Table 2. Evening 1 class has lower SAT scores because older pre-MBA students took them before the emphasis of questions was changed and score scale upwardly adjusted. Students majoring in accounting, actuarial science, finance and finance/economics were classified as quantitative majors. Although, math was not a prerequisite for Principles of Finance at the time the Test was administered, the authors believe it should be. To show the importance of College Algebra for Principles of Finance, data on College Algebra grades and when the course was taken were collected, just like it was done for prerequisites.

Pedagogical variables suffer from missing data problem. For 23% of students in Evening 1 class enrolled in the pre-MBA program no data was available for their major, when they finished high school and entered college, nor high school or college GPA. The University also

did not have data on when prerequisites and math classes were taken, or grades earned in those classes for pre-MBA students. Further problems were caused by the lack of data on high school GPA and SAT scores for 88% of the transfer students which accounted for 44% of all students. In addition there were no grades for prerequisites and College Algebra for all transfer students.

Table 2: Pedagogical Characteristics of the Sample

Variable		Section					Total
		Day 1	Day 2	Evening 1	Evening 2	POL	
Tested		36.00	21.00	13.00	21.00	20.00	111.00
High School GPA		3.20	3.24	3.30	3.15	3.17	3.20
Total SAT Score		1,013.70	1,004.62	895.00	1,059.09	1,006.25	1,005.33
College QPA		3.05	3.11	3.26	3.17	3.09	3.11
% Quantitative Majors		13.89	38.10	23.08	57.14	35.00	31.53
Macroeconomics Prerequisite	Terms Ago	6.14	4.24	10.89	4.86	5.85	5.91
	Grade Earned	3.08	2.75	2.73	3.11	2.83	2.95
Accounting Prerequisite	Terms Ago	2.63	2.19	3.13	2.43	2.85	2.63
	Grade Earned	2.56	3.00	2.40	2.96	2.37	2.67
College Algebra	Terms Ago	7.27	4.62	11.25	6.39	5.68	6.57
	Grade Earned	2.74	3.14	2.42	3.18	3.04	2.93

DESIGN AND STRUCTURE OF THE TEST

The Pre and Post Test for Principles of Finance contained 35 multiple choice questions selected from tests previously given by the instructors. The test included questions based on prior knowledge from the prerequisites courses and math classes, as well as those that could not be answered correctly prior to completing the Principles of Finance course.

The balance between high- and low-order questions, covering the major topics taught in the principles course was another selection criterion. For low-order items, 17 questions requiring recognition of terminology and definitions were chosen. The following are examples of low-order questions that students are expected to correctly answer before and only after taking the class:

Before: *Capital structure is*
  - *a) the mix of preferred and common stock that makes equity account of the firms.*
  - *b) the mix of short-term and long-term assets held by a firm.*
- correct — *c) the mixture of long-term debt and equity of a firm.*
  - *d) the long-term and fixed assets of the firm.*
  - *e) the mix of current liabilities and long-term debt.*

After: *The _____ decision rule is considered the "best" in principle.*
  - *a) internal rate of return*
  - *b) payback period*
  - *c) average accounting return*
- correct — *d) net present value*
  - *e) profitability index*

High-order questions were based on analysis and application of definitions and calculations, asked in 11 and 7 questions respectively. Examples of high-order analytical questions that students were expected to answer before and after taking the class are:

<u>Before</u>: *Which of the following is false regarding the difference between debt and equity?*
　　　　　a) Equity is ownership in a firm but debt is not.
correct　*b) Periodic payments to either class of security are tax deductible for the issuer.*
　　　　　c) Stockholders have voting power while creditors do not.
　　　　　d) Interest payments are legally binding while dividends on equity are not.
<u>After</u>: *Given no change in required returns, the value of stock with constant dividend*
　　　　　a) increases over time at a rate of r percent
　　　　　b) decreases over time at a rate of r percent
　　　　　c) increases over time at a rate equal to the dividend yield
　　　　　d) decreases over time at a rate equal to the dividend yield
correct　*e) remain unchanged*

Illustrations of computational high-order questions answerable before and after class are:

<u>Before</u>: *Your employer offers a bonus of $1,000 today or a lump sum payment of $1,250 three years from now. If you earn 7% return, which of the following is true?*
correct　*a) Take the lump sum because it has the higher present value.*
　　　　　b) Take the lump sum because it has the lower future value.
　　　　　c) Take the bonus because it has the lower present value.
　　　　　d) Take the bonus because it has the higher future value.
<u>After</u>: *What is the expected return on an asset with beta of 0.6, if the expected market return is 15% and the risk-free rate is 6%?*
　　　　　a)　5.4%
　　　　　b)　9.6%
correct　*c)　11.4%*
　　　　　d)　15.0%

Reliability or internal consistency of the Test was analyzed using Cronbach's Alpha, based on the average inter-question correlations. The Cronbach's Alpha reliability coefficient of 0.851 exceeded the minimum of 0.7 for reliable pen and paper tests. This suggests that the Test is internally consistent and that it can be used to assess the outcome of students' learning.

PRE AND POST TEST SCORES

The comparisons of Pre and Post test scores for different type of questions are given in Table 3. The Pre and Post Test score is the average number of correct answers for a given type of question relative to the total number of items with the same level of difficulty. Based on the t-test, paired differences between Pre and Post Test scores were statistically significant at the 1% level for the entire Test in each section and the whole sample. Number of paired differences within question types was not large enough for meaningful statistical analysis. Since numbers of items with the same level of difficulty varies, instead of differences in pre/post performance, students' learning was illustrated by the rate of change between the Pre and Post Test scores.

Students showed the most improvement in the computational high-order questions, followed by the low-order questions. The least progress occurred in the analytical high-order questions. These results could be at least partially explained by the lowest average Pre Test score (base of comparison) for the high-order computational questions.

Table 3: Students' Performance on Different Level of Questions

Type of Questions		Section					Total
		Day 1	Day 2	Evening 1	Evening 2	Part-On-Line	
Tested		36.00	21.00	13.00	21.00	20.00	111.00
Low-order: 17 Definitions	Pre	29.86	38.10	34.13	39.29	35.94	34.80
	Post	67.63	35.56	57.69	51.49	62.81	60.87
	Rate	**126.49**	**-6.67**	**69.03**	**31.05**	**74.76**	**74.91**
High-order: 11 Analysis	Pre	31.57	39.83	37.06	38.96	32.27	35.30
	Post	58.97	30.41	55.24	53.25	53.64	54.87
	Rate	**86.79**	**-23.65**	**49.06**	**36.68**	**66.22**	**55.44**
High-order: 7 Calculations	Pre	14.68	12.93	23.08	18.37	25.71	18.02
	Post	50.18	26.60	36.26	36.05	42.86	43.37
	Rate	**241.83**	**105.72**	**57.11**	**96.24**	**66.71**	**140.68**
Entire Test: 35 Questions	Pre	27.06	32.51	32.09	34.00	32.29	30.29
	Post	66.11	43.26	52.09	48.17	55.29	54.80
	Rate	**144.35**	**33.04**	**62.33**	**41.68**	**71.24**	**80.94**
	t-test	*5.48*	*10.01*	*3.17*	*4.44*	*5.48*	*11.93*

Even though the pre test scores for the low-order and analytical high-order items were similar, and almost double those for the computational high-order questions, improvement in low-order items were easier to achieve given the lower level of difficulty.

The pre and post performance on the different topics is presented in Table 4. For the purpose of comparison, the overall results for the entire test are repeated as well. Since Principles of Finance is the first finance course students take with emphasize on the time value of money and capital budgeting, it is of little surprise that the most improvement occurred in the introductory material covering the characteristics of corporations, followed by the investment criteria and the time value of money. Overall the least progress was related to the risk/return tradeoff and capital asset pricing model, which was expected given the level of difficulty and the fact that the material will be revisited in greater detail in the investment courses.

Although performances on the various topics covered in the class were substantially different across individual sections, in general test results were similar to those observed for the entire sample. While the ranking varied across individual samples the most improvement took place in the introductory material, time value of money and investment criteria. The worst performance across individual sections varied so much that no generalization could be made. Overall, the results indicate that learning did occur.

Table 4: Students' Performance on Different Topics of Material

Topic		Section					Total
		Day 1	Day 2	Evening 1	Evening 2	Part-On-line	
Tested		36.00	21.00	13.00	21.00	20.00	111.00
Introduction: 5 Questions	Pre	21.67	27.62	26.15	28.57	21.00	24.50
	Post	67.69	31.72	55.38	45.71	67.00	59.28
	Rate	**212.37**	**14.84**	**111.78**	**59.99**	**219.05**	**141.96**
Time Value of Money: 5 Questions	Pre	45.56	41.90	47.89	47.62	41.00	44.68
	Post	76.92	48.28	76.92	66.67	75.00	74.77
	Rate	**68.83**	**15.23**	**60.62**	**40.00**	**82.93**	**67.35**
Bonds: 4 Questions	Pre	22.92	21.43	30.77	33.33	38.75	28.38
	Post	62.18	29.31	42.31	40.48	52.50	51.58
	Rate	**171.29**	**36.77**	**37.50**	**21.45**	**35.48**	**81.75**
Stocks: 6 Questions	Pre	29.63	42.86	35.90	42.66	41.67	37.54
	Post	58.97	31.61	52.56	53.17	55.00	55.11
	Rate	**99.02**	**-26.25**	**46.41**	**24.64**	**31.99**	**46.80**
Investment Criteria: 6 Questions	Pre	24.54	21.43	23.08	23.81	30.00	24.62
	Post	56.41	29.89	48.72	42.86	52.50	50.90
	Rate	**129.87**	**39.48**	**111.09**	**80.01**	**75.00**	**106.74**
Risk/Return & CAPM: 9 Questions	Pre	21.60	34.54	30.77	30.69	26.11	27.38
	Post	52.42	24.52	41.88	41.27	41.11	44.94
	Rate	**142.69**	**-29.01**	**36.11**	**34.47**	**57.45**	**64.13**
Entire Test: 35 Questions	Pre	27.06	32.51	32.09	34.00	32.29	30.29
	Post	66.11	43.26	52.09	48.17	55.29	54.80
	Rate	**144.35**	**33.04**	**62.33**	**41.68**	**71.24**	**80.94**
	t-test	*10.01*	*3.17*	*4.44*	*5.31*	*5.48*	*11.93*

CORRELATIONS

To explore the impact of potential determinants of learning on students' performance hypothesized drivers of performance with the Pre and Post Test scores were correlated. In order to preserve space only the results for significantly correlated determinants of performance are presented in Table 5. Even though College Algebra was hypothesized to be an important determinant of performance, it was not expected that it would have a higher positive impact on Pre Test scores than both Macroeconomic and Accounting prerequisites, and that it would be surpassed only by students QPA. This finding provided the most support for our view that College Algebra should be added as a prerequisite to the Principles of Finance course. Overall, determinants of performance that are positively significantly correlated with the Pre Test scores indicate that good students, measured by higher QPA scores, and who did well in College Algebra as well as prerequisites, had a better foundations for Principles of Finance.

Absence of correlation between Pre and Post Test scores, as well as a lack of significant effect of College Algebra and Accounting prerequisite on the Post Test scores, combined with the finding that learning did occur, suggests that attention to individual student's needs is effective in providing support to all students necessary for them to achieve the learning objectives, which is one of the goals stated in the School of Business Mission Statement.

However, even though instructors were able to eliminate differences in Pre Test scores related to course specific knowledge and skills, students with broader knowledge base, indicated by significant positive effect of QPA, Macroeconomics prerequisite, and SAT on the Post Test score, continue to perform better. Negative impact of the time since finishing high school on the Post Test scores show that continuous and orderly progress through higher education is another pedagogical characteristic, in addition to general knowledge, crucial for student learning that cannot be eliminated during the course of one principles class.

Table 5: Correlations Between Pre-, Post-test Scores and Their Determinants

Score Determinants		Pre-test Score	Post-test Score
Pre-test Score	Pearson Correlation	1.000	-.075
	Sig (2-tailed), N = 111		.434
College Algebra Grade	Pearson Correlation	.286(*)	.099
	Sig (2-tailed), N = 55	.035	.472
Accounting Prerequisite Grade	Pearson Correlation	.215(*)	.172
	Sig (2-tailed), N = 86	.047	.113
Macro-Economics Prerequisite Grade	Pearson Correlation	.279(*)	.373(**)
	Sig (2-tailed), N = 76	.015	.001
College QPA	Pearson Correlation	.299(**)	.280(**)
	Sig (2-tailed), N = 108	.002	.003
Total SAT Score	Pearson Correlation	.101	.369(**)
	Sig (2-tailed), N = 63	.433	.003
Number of Terms Since Finishing High School	Pearson Correlation	.029	-.228(*)
	Sig (2-tailed), N = 101	.771	.022

** Correlation is significant at the 0.01 level (2-tailed).
 * Correlation is significant at the 0.05 level (2-tailed).

There were no statistically significant correlations between the test scores and the number of credits student took or the number of hours that students worked per week.

In addition to these correlative tests, ANOVA was used to examine if there were differences in the scores based on gender, type of student (transfer/non-transfer) and type of major (quantitative/non-quantitative). The results for ANOVA are provided in Table 6. While no significant differences in the Pre Test scores were detected with respect to gender and type of students, the Post Test scores showed that the female and transfer students learned significantly less, indicating that they require additional help and/or different teaching methods in order to achieve the learning goals.

Another example of instructors' ability to help students achieve the learning goals is the result that significantly higher Pre Test scores for students with quantitative major (accounting, actuarial science, finance and finance/economics) disappear in the Post Test performance.

Table 6: Pre- and Post-test Scores ANOVA for Determinants Gender, Transfer and Major

Determinant Gender		Sum of Squares	Df	Mean Square	F	Sig	Mean for 111 Students	
							60 Male	Female
Pre-test Scores	Between Groups	3.12	1	3.12	0.32	.57	10.98	10.65
	Within Groups	1,070.63	109	9.82				
Post-test Scores	Between Groups	364.12	1	364.12	8.89	.00	20.85	17.22
	Within Groups	4,462.28	109	40.94				
Determinant Transfer							52 Transfer	Non-Transfer
Pre-test Scores	Between Groups	5.30	1	5.30	0.54	.46	10.60	11.03
	Within Groups	1,068.45	109	9.80				
Post-test Scores	Between Groups	498.40	1	498.40	12.55	.00	16.92	21.17
	Within Groups	4,328.00	109	39.71				
Determinant Major							35 Quant	Non-Quant
Pre-test Scores	Between Groups	155.23	1	155.23	18.42	.00	12.57	10.03
	Within Groups	918.52	109	8.43				
Post-test Scores	Between Groups	5.71	1	5.71	.13	.72	19.51	19.03
	Within Groups	4820.69	109	44.23				

CLOSING THE ASSURANCE OF LEARNING LOOP

The continuous process of assurance of learning at the School of Business is conducted in the following way. The assurance of learning committee, consisting of representatives from each department, develops the plan for assessing particular learning goals and objectives in specific classes each semester. In order to ascertain that the appropriate assessment tools will be used and to help faculty with less experience in measuring outcome assessment, participating faculty submit their course assessment plans to the committee for review at the beginning of each term. At the end of the semester instructors' reports and recommendations are submitted to the committee for evaluation. Any type of recommendation (ranging from making changes in content and delivery of the class and/or curriculum, to collecting more data or not making any changes) based on the gathered data, followed by the appropriate actions represents closing the assurance of learning loop. It is important to note that faculty committees drive this process and that the assurance of learning is not used as an evaluative tool for faculty promotion. Assurance of learning is focused on improving the courses and course delivery for the students.

In our particular case, the design and the structure of the Test together with the results were discussed at the department level to share our findings with individual instructors and initiate changes in the School of Business undergraduate curriculum. The entire department shared our view that College Algebra should be added as a prerequisite for Principles of Finance. Our recommendation, concurred by the School of Business Assurance of Learning Committee, was passed on to the School of Business Undergraduate Curriculum Committee, which agreed with our assessment and made its own recommendation about curriculum change to the Dean of the School of Business, who agreed that the change be made. If proposed curriculum change had impact outside the School it would have been sent first to the University Curriculum Committee and then submitted to the Provost and Deans Council for final approval.

CONCLUSIONS

This paper provides an example of course based assurance of learning. How a pre and post test was developed and how it was verified that its ability to measure that learning had occurred was described. Finally the scores were used to explore the effect of potential determinants of learning and how their impact was addressed by changing course content and delivery, advising, course sequence and/or curriculum.

The authors created the Pre and Post Test for Principles of Finance by selecting 35 multiple choice questions from tests they previously administered. Questions on the major areas of the principles course, which students should be able to answer before and only after taking the class, were selected to include low-order (based on definitions), high-order analytical (requiring application of definitions) and computational high-order items.

Cronbach's Alpha of 0.851 exceeded the minimum of 0.7 for reliable pen and paper test, indicating internal consistency of the test and its ability to assess outcomes of learning. Student t-test, statistically significant at the 1% level, for the paired pre and post test score differences, in the entire sample and within different sections, suggests that learning did occur.

Overall, performance was improved most for the computational high-order questions, followed by the low-order items, while the least improvement occurred for the analytical high-order questions. Finding that performance on corporate characteristics, investment criteria and time value of money improved the most is of little surprise given that the principles course is the first finance class with emphasize on capital budgeting. That the least performance improvement occurred for the risk/return tradeoff and capital asset pricing model was also not surprising given the level of difficulty and that the material will be revisited in the investment courses.

Significant positive effect of grades from Accounting, Macroeconomics, College Algebra, and QPA on Pre Test scores suggest that students with good math skills, possessing broader general knowledge, and who did well in the prerequisites, have substantially better foundations for Principles of Finance. Significant and positive impact of Macroeconomics, college QPA and SAT (identifiers of good students) on the Post Test scores, which are no longer affected by the grades from Accounting and College Algebra, indicate that instructors' attention to individual students' needs is effective in eliminating pre test differences within class related to class specific knowledge and skills, but that good students with better general knowledge learn more. Significant negative correlations between Test scores and number of terms since finishing high school point out the difficulties of students whose progress through higher education was neither continuous nor orderly or smooth. While the mean Pre Test scores were almost identical ANOVA uncovered statistically smaller Post Test score for female and transfer students, suggesting they need additional help and/or different teaching methods. ANOVA showed significantly higher Pre Test scores for students with quantitative majors and statistically indistinguishable mean Post Test scores for quantitative and non-quantitative majors.

REFERENCES

Cooley, P.L. & Heck, L.J. (1996). Establishing Benchmark for Teaching the Undergraduate Introductory Course in Financial Management. Journal of Financial Education, 22 (Fall), 1-10.

Filbeck, G. & Smith, L.L. (1996). Learning Styles, Teaching Strategies, and Predictors of Success for Students in Corporate Finance. Financial Practice and Education, Spring/Summer, 74-85.

Michlitsch, J.F., & Sidle, M.W. (2002). Assessing Student Learning Outcomes: A Comparative Study of Techniques Used in Business School Disciplines. Journal of Education for Business, 77 (3), 125-130.

Nale, R.D., Rauch D.A. & Barr, P.B. (2000). An Exploratory Look at the Use of Importance-Performance Analysis as a Curricular Assessment Tool in Schools of Business. Journal of Workplace Learning, 12 (4), 139-145.

Pritchard, R.E., Romeo, G.C., Saccucci M.S. & Potter, G.C. (2001). Identifying Student Algebra Skills as a Part of Outcomes Assessment in Principles of Finance. Journal of the Academy of Business Administration, 6, 8-15.

Suskie L. (2004). Assessing Student Learning: A Common Sense Guide. Anker.