



Evaluation Series

Report on the PLATO Web Learning Network Implementation for Developmental Education at Miami- Dade College, Miami, Florida

Evaluation Prepared by:

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Executive Summary

Miami-Dade College serves a large and diverse student population. When degree-seeking students are first admitted, they take the Computerized Placement Test to identify whether they have the skills in reading comprehension, sentence skills, arithmetic, and elementary algebra needed for success in college. Many students who score lower than a given level are enrolled in PLATO Web Learning Network courseware modules to bring up their skill levels. The purpose of this study is to examine the relationship between the number of hours students spend studying on these PLATO courseware modules and increases in their Computerized Placement Test scores.

The data collected in this report indicate that this is a successful implementation of PLATO Web Learning Network in a community college Developmental Education setting. Students spend an average of 35 to 40 hours engaged with the courseware modules in each term studied, some less and some more.

The CPT test scores increased significantly between the initial test and the retest. The gain was around 16 points on each of the three tests. This increase is about one standard deviation in magnitude (effect size of 1.0) —a large gain considering it occurred within one term of study. The greatest gains were achieved in elementary algebra skills; however, meaningfully large gains were observed for reading comprehension and arithmetic tests also.

Most interestingly, PLATO Web Learning Network use is positively related to score gain on the CPT retake. The analysis showed that the more time students spent on the courseware modules, the greater their gain on the retake. The average percentage gain varied depending on which test is considered: elementary algebra, 49 percent; reading comprehension, 34 percent; and arithmetic, 28 percent.

It would be worthwhile expanding and continuing the evaluation of this implementation to examine a wider range of issues and to compare it with alternatives for increasing student CPT scores.

Miami-Dade College

Miami, Florida

Miami-Dade Community College (previously known as Miami-Dade Community College) serves a large and diverse student population. When degree-seeking students are first admitted, they take the Computerized Placement Test to identify whether they have the skills in reading comprehension, sentence skills, arithmetic, and elementary algebra needed for success in college. Many students who score lower than a given level are enrolled in PLATO Web Learning Network courseware modules to bring up their skill levels. The purpose of this study is to examine the relationship between the number of hours students spend studying in these courseware modules and increases in their Computerized Placement Test scores.

School Profile

Miami-Dade College (M-DC) awards more associate degrees than any other school in the nation and graduates the highest number of minority students. M-DC is a multi-campus, four-year (now offers Baccalaureate degrees in Teaching and Nursing) college, with six campuses and numerous outreach centers. Miami-Dade is nationally recognized as one of the largest and best colleges in the country and serves more than 163,000 students each year in both credit and noncredit courses.

The Fall 2001 Credit Student Profile:

- 30 percent of Miami-Dade's students are between 21 and 25 years of age.
- The average student age is 27.
- 66 percent attend on a part-time basis.
- Ethnic mix: 12 percent white non-Hispanic; 22 percent black non-Hispanic; 65 percent Hispanic; 2 percent other. Miami-Dade College enrolls the most Hispanic students and the second-most black students of any college or university in the United States.
- 61 percent of Miami-Dade students are female, 39 percent are male.

Computerized Placement Test

As part of the admissions process and before M-DC students register for classes, students take a basic skills assessment test, the Computerized Placement Test (CPT). The assessment test covers Reading Comprehension, Sentence Skills, Elementary Algebra skills and Arithmetic. Students who are required to take the CPT include:

- All first time college students who designate themselves as degree seeking
- All students who register for any English or mathematics course
- All students who register for more than 12 cumulative credits

The CPT was developed by the College Board, with the help of committees of college professors, to provide information about students' levels of skill in reading, English, and mathematics. The CPT helps to determine the reading, English, and mathematics courses most appropriate for students as they begin their studies at M-DC.

The CPT is administered on a computer. Students give their answers by using either the keyboard or the mouse. Should students have any questions or problems, a test administrator is always present. The number of questions on the tests ranges from 12 to 20. The questions appear one at a time on the computer screen. Most questions are multiple-choice, and all students need to do is use the space bar or mouse to select the desired answer. When students have completed the question and verified their answer, a new screen appears with the next question.

Each test is designed using adaptive techniques. This means that the computer automatically determines which questions are presented based on responses to prior questions. This technique "zeroes-in" on just the right questions to ask without being too easy or too difficult. The greater the student's demonstrated skill level, the more challenging the questions become. This evaluation will report the results for three subtests in the CPT: Reading Comprehension, Arithmetic, and Elementary Algebra.

Reading Comprehension. This test is designed to measure how well students understand what they read. It contains 20 questions; 83 is the passing scaled score. Some questions ask students to decide how two sentences are related. Other questions ask students to read passages of various lengths and then interpret and draw conclusions from what they have read.

Arithmetic. This test measures skills in three primary categories.

- 1) Operations with whole numbers and fractions includes:
 - a. Addition, subtraction, multiplication, division
 - b. Recognizing equivalent fractions and mixed numbers
- 2) Operations with decimals and percents includes:
 - a. Addition, subtraction, multiplication, and division
 - b. Percent problems, decimal recognition, fractions
 - c. Percent equivalencies, and estimation problems
- 3) Applications and problem solving include:
 - a. Rate, percent, and measurement problems
 - b. Geometry problems
 - c. Distribution of a quantity into its fractional parts

A total of 16 questions are asked; the passing scaled score is 90.

Elementary Algebra. There are also three categories in the Elementary Algebra Test.

- 1) Operations with integers and rational numbers, includes:
 - a. Computation with integers and negative rationals
 - b. The use of absolute values, and ordering
- 2) Operations with algebraic expressions:
 - a. Evaluation of simple formulas
 - b. Expressions and adding
 - c. Subtracting monomials and polynomials
 - d. The evaluation of positive rational roots and exponents
 - e. Simplifying algebraic fractions and factoring

- 3) Equation solving, inequalities, and word problems including:
 - a. Solving verbal problems presented in algebraic context
 - b. Geometric reasoning
 - c. The translation of written phrases into algebraic expressions
 - d. Graphing

A total of 12 questions are presented. Items are scaled so that the passing score is 81.

PLATO Web Learning Network

After extensive advisement and counseling, some M-DC students who do not pass all subtests of the CPT meet with counselors from the System for Applied Individualized Learning (SAIL) program at M-DC and are given prescriptions of what to study to pass the CPT. An important part of the prescription includes assignments to complete specific PLATO Web Learning Network courseware modules. The object of prescribing these courseware modules is for students to quickly remediate their skills, and retake and pass the CPT, so they can enroll in credit granting classes.

The PLATO Web Learning Network courses are offered in the Computer Courtyard, located at the North Campus of Miami-Dade Community College, as well as the S.A.I.L. Lab of Miami-Dade College. The sophisticated multimedia center features over 250 IBM Pentium 4 and Macintosh G4 computers within a networked environment that offers full Internet access and multimedia facilities to registered students, staff, and faculty.

The computer labs are open and available for use from 8:00 a.m. to 10:00 p.m. Students are assisted in using the courses by eight full-time staff members and thirty-two part-time paraprofessionals. The level of education of the paraprofessionals is: close to completing their Associates of Arts degree, A.A. and/or A.S. degree completed and/or B.A. degree and have training and experience in computer operations.

The students who participate in this program are representative of the cross-section of students attending M-DC. Of those students who start the program, an estimated 90 percent finish the program and retake the CPT tests needed.

Data Analysis

Data reported in this analysis were collected by M-DC staff as part of their ongoing monitoring of the performance of the SAIL program.

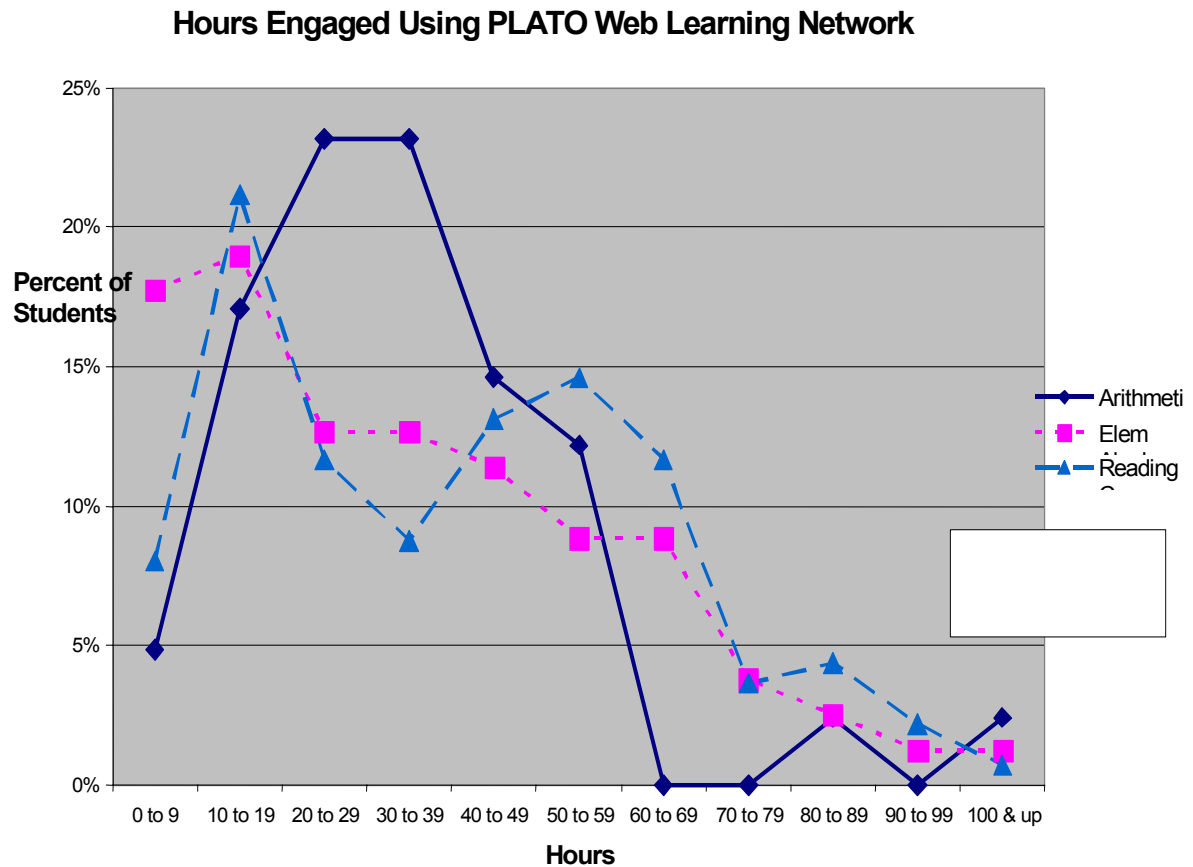
Sample. The students received PLATO Web Learning Network instruction because they needed to gain skills in three content areas: reading comprehension, arithmetic, and/or elementary algebra. A student may be enrolled in instruction in one or more of these areas. The number of M-DC students with pre and post CPT scores and PLATO Web Learning Network use data are as follows: reading comprehension, 137 students; arithmetic, 82 students; and elementary algebra, 79 students. The students in this study were enrolled during the 2001 school year, and data are from either the first, second, or combined third/fourth term of that year.

PLATO Web Learning Network Use. The computer program tracked the number of hours students were engaged in studying the courseware modules. Students studied modules between 5 to 173 hours. The average student spent between thirty-five and forty hours engaged in PLATO Web Learning Network studies. Table 1 presents the number of hours spent studying the courseware modules by content area; Figure 1 shows the distribution of time by content area.

Table 1. Hours of Use by Content Area Studied

Content Area	Engaged Hours Studying Modules					
	# of Students	Mean	Standard Deviation	Median	Min.	Max.
Reading Comprehension	137	40.9	26.3	40	5	173
Arithmetic	82	34.9	19.5	31	5	105
Elementary Algebra	79	34.5	24.6	30	5	106

Figure 1.



CPT Scores. Student CPT scores increased in all three content areas between the initial CPT administration and the retesting after students had worked on the PLATO

Web Learning Network courseware modules. Student CPT scores increased about sixteen points on average for reading comprehension, arithmetic, and elementary algebra. These were statistically significant changes for all three content areas.

One common way of judging how meaningful such a gain score might be is to use the average standard deviation of the pre- and post-scores as a measuring stick. Doing this we find that a gain of 16 points is about one standard deviation in size (effect size of 1.0). This magnitude of difference is usually considered large and educationally meaningful. This magnitude of change is particularly meaningful given that it occurred within the relatively short period of one school term.

Table 2. Pre and Post CPT Scores

Content Area	# of Students	Initial CPT		CPT Retest		Pre Post Corr.	Effect Size
		Mean	Stand. Dev.	Mean	Stand. Dev.		
Reading Comprehension	137	53.5	15.1	69.7	16.9	0.740	1.01
Arithmetic	82	36.6	15.0	52.6	19.4	0.737	0.93
Elementary Algebra	79	40.0	17.8	56.6	25.0	0.724	0.78

Note: All pre-post differences are statistically significant beyond the .01 level.

Relationship of CPT Scores to PLATO Web Learning Network Use. To

see what affect the courses had on CPT scores, gains in CPT scores were correlated with the number of hours students were engaged in the courseware. Gains were computed using a percent gain score. The percent gain was computed by subtracting the initial CPT score from the retest score and dividing the difference by the initial CPT score.

The CPT percent gain was regressed against the number of hours students were engaged. On all three tests the relationship between hours engaged and CPT gain was positive. The mean percentage gain on the CPT ranged from 28 percent gain on the arithmetic test to 60 percent gain on the elementary algebra test. For every hour students spent on the courseware instruction, they gained from 0.61% to 1.86% on the CPT retake.

Table 3. CPT Percent Gain by Hours

Content Area	# of Students	% Gain Score		Regression Formula	
		Mean	Stand. Dev.	Intercept	Slope
Reading Comprehension	137	34%	29%	3.68%	0.75%
Arithmetic	82	28%	17%	6.97%	0.61%
Elementary Algebra	79	49%	60%	-15.78%	1.86%

Note: All regressions are statistically significant beyond the .01 level.

Figure 2.

CPT Reading Comprehension Gains by Hours Engaged

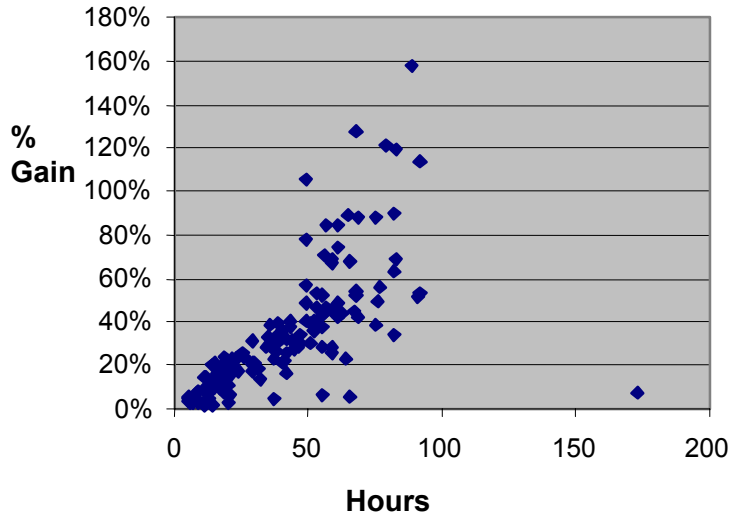


Figure 3.

CPT Arithmetic Gains by Hours Engaged

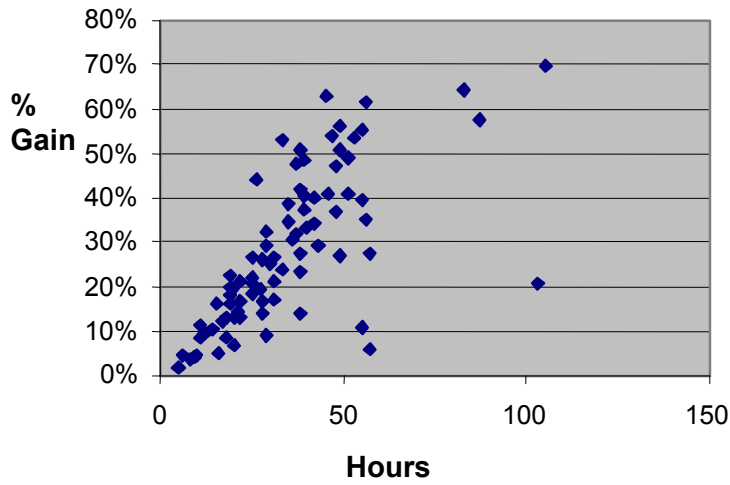
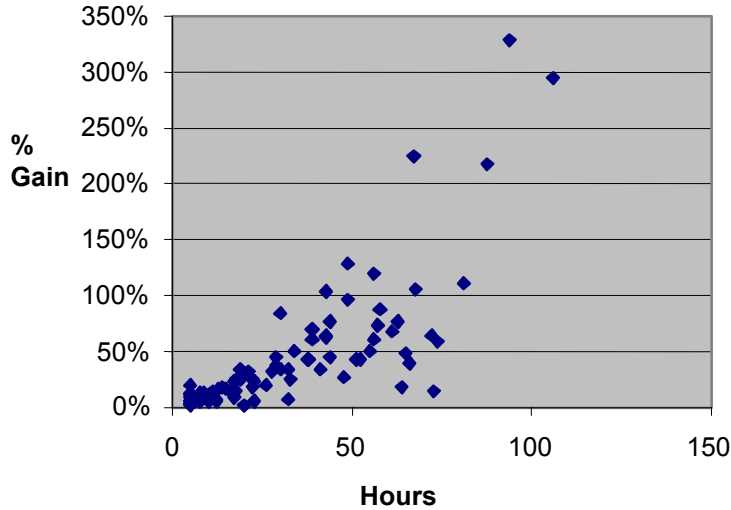


Figure 4.

CPT Elementary Algebra Gains by Hours Engaged



Conclusions

This appears to be a successful implementation of the PLATO Web Learning Network courseware in an adult education setting. Students spend an average of 35 to 40 hours engaged with the courses in each term studied, some less and some more.

The CPT test scores increased significantly between the initial test and the retest. The gain was around 16 points on each of the three tests. This increase is about one standard deviation in magnitude—a large gain considering it occurred within one term of study. The greatest gains were achieved in elementary algebra skills; however, meaningfully large gains were observed for reading comprehension and arithmetic tests.

Most interestingly, use of PLATO Web Learning Network is positively related to score gain on the CPT retake. The analysis showed that the more time students spent on the courseware, the greater their gain on the retake. The average percentage gain varied depending on which test is considered: elementary algebra, 49 percent; reading comprehension, 34 percent; and arithmetic, 28 percent.

It would be worthwhile doing a more formal evaluation of this implementation of the PLATO Web Learning Network to examine a wider range of issues and to compare with other alternatives for increasing student CPT scores.

About the Author

David W. Quinn is currently working as an independent evaluator specializing in evaluating technology use for learning and teaching. He received a doctorate in educational evaluation from Western Michigan University in 1978. He recently completed ten years at the North Central Regional Educational Laboratory as a Senior Program Associate, where he managed the evaluation unit and evaluated technology use in many settings. He has evaluated technology use for the states of Indiana and Virginia and for school districts in Chicago, Miami-Dade, and Los Angeles County. Before NCREL, Dr. Quinn had conducted numerous evaluation studies for clients in K-12, university, not-for-profit social services, and for-profit training companies. For ten years he was on the faculty in the Department of Instructional Science, Brigham Young University, where he taught graduate research methods courses. He is the author of journal articles and book chapters about evaluating technology use in education.