

DOCUMENT RESUME

ED 442 484

JC 000 406

AUTHOR Siadat, Mohammad Vali; Callahan, Thomas
TITLE The Effectiveness of the Mathematics (100/110) Placement Test (1983-1984).
PUB DATE 1984-00-00
NOTE 11p.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; *Community Colleges; *Educational Testing; *Mathematics Achievement; Mathematics Education; *Mathematics Tests; Student Evaluation; *Student Placement; Two Year Colleges

ABSTRACT

The need for a mathematics placement test was acknowledged because a number of students registered in introductory algebra (Math 110) were struggling with problems involving only arithmetic operations. A placement test was selected with the intention to effectively detect students with arithmetic deficiencies and place them in a remedial mathematics class that would be called Mathematics 100. At the beginning of fall semester 1983, most of the Mathematics 110 teachers administered the Mathematics (100/110) Placement Test to 150 students. The scores were recorded and kept. The idea was to monitor the students and compare their course performance with their placement test scores. The purpose of this paper is to describe how the data was organized, analyzed, and interpreted. It was found that 83% of the students who scored at or above a 44 on the placement test received a grade of C or better in Mathematics 110, compared with 46% of those who scored below 44. In light of the data and analysis presented in this report, the use of the placement test is warranted. Clearly, with its use, students can be placed much more effectively in Mathematics 100 and Mathematics 110. Its continued use will alleviate much frustration on the part of the students and teachers. (VWC)

The Effectiveness of the
Mathematics (100/110) Placement Test
(1983-1984)

Mohammad Vali Siadat & Thomas Callahan

Department of Mathematics
Richard J. Daley College
Chicago, Illinois

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as
received from the person or organization
originating it.

Minor changes have been made to
improve reproduction quality.

• Points of view or opinions stated in this
document do not necessarily represent
official OERI position or policy.

PERMISSION TO REPRODUCE AND
DISSEMINATE THIS MATERIAL IN
MICROFICHE ONLY HAS BEEN GRANTED BY

M.V. Siadat

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

1000406

ACKNOWLEDGEMENTS

We would like to thank George Brixie, John Sword, and the late Mary Kay Prendergast for their cooperation and help in the preparation of this paper.

The need for a mathematics placement test was recognized when a number of students registered in introductory algebra (Math 110) were struggling with problems involving only arithmetic operations. A placement test was selected with the hope that we could effectively detect students with arithmetic deficiencies and place them in a remedial mathematics class which would be called Mathematics 100.

The first placement test was given in the summer of 1983. We felt that a seventh grade or better arithmetic ability would be sufficient to enter Mathematics 100. The number of students who scored less than a seventh grade level was enough to create one Mathematics 100 class.

The class, which consisted of 25 students, ran for the first time in the fall semester, 1983.

We probably could have filled more than one Mathematics 100 class; however, many of the students who were scheduled to take the placement test did not. Consequently, they had to be placed without the benefit of placement test scores. This meant that there were students in Mathematics 110 who probably did not belong there. Although this was unfortunate it did provide us with an excellent opportunity to test the effectiveness of The Mathematics (100/110) Placement Test.

At the beginning of the Fall semester, 1983, most of the Mathematics 110 teachers administered the Mathematics (100/110) Placement Test to their students. The scores were recorded and kept. The idea was to monitor the students and compare their course performance with their placement test scores.

The purpose of this paper is to describe how the data obtained from above was organized, analyzed, and interpreted. We hope that it will provide convincing arguments attesting to the usefulness and reliability of the Mathematics (100/110) Placement Test.

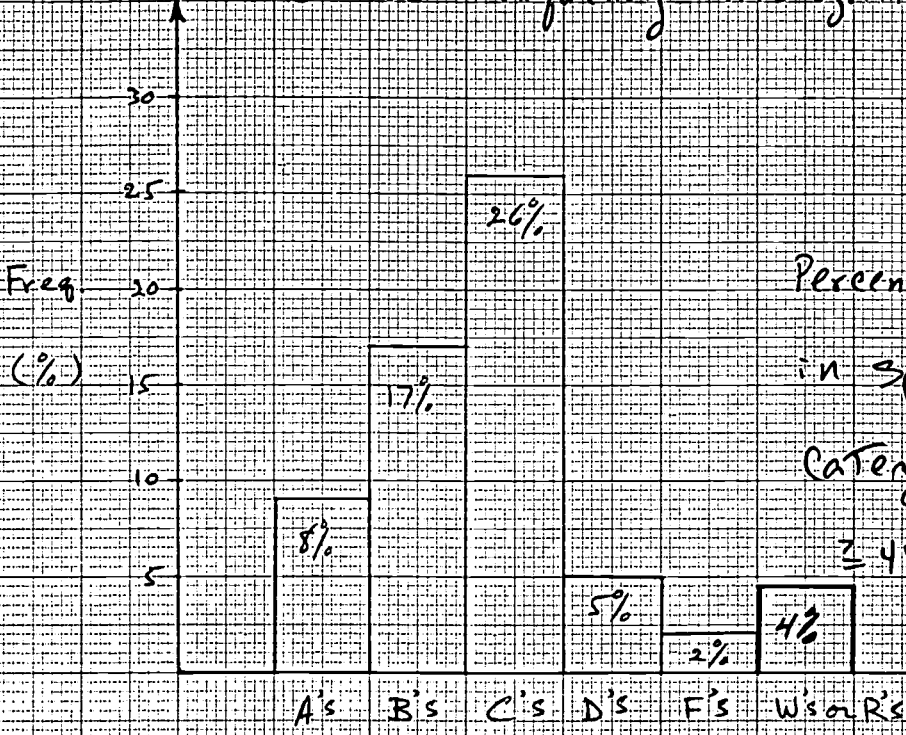
Thanks to the cooperation of the Mathematics 110 instructors we were able to obtain data on 150 students. These students were given the Mathematics (100/110) Placement Test at the outset of Mathematics 110. Then their course grades and placement test scores were compared at the end of the semester.

It must be remembered that many of the students were not placed into these Mathematics 110 classes with the benefit of placement test scores. Also, it should be pointed out at this time that a score of 44 or better on The Mathematics (100/110) Placement Test indicates a seventh grade or better arithmetic level.

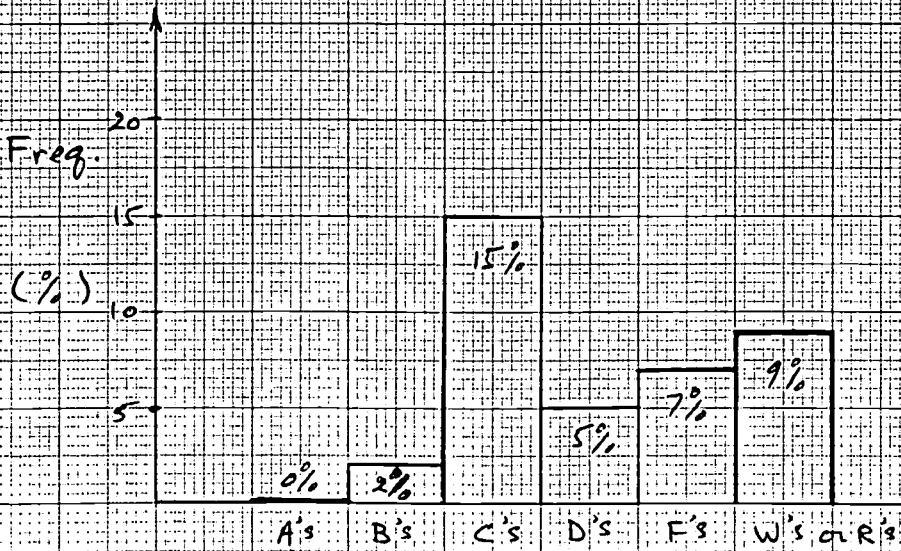
We found that of those students who scored 44 or better on the Mathematics (100/110) Placement Test 83% received a grade of "C" or better in Mathematics 110. (NOTE: In order to enter Math. 112 a "C" or better in Math. 110 is required). Whereas of those students who scored less than 44 on the Mathematics (100/110) Placement Test only 46% received a "C" or better in Mathematics 110. (See Histograms on pg. 6)

The success rate, for a "C" or better in Math. 110, is almost two times greater for those with a seventh grade or better arithmetic ability.

Relative Frequency Histograms



Percentage of students,
in specific grade
categories, who scored
 ≥ 44 on The Mathematics
(100/100) Placement
Test



< 44 on
The Mathematics
(100/100) Placement
Test

A confidence interval can be created for p , the true percentage of all students who will receive a "C" or better in Mathematics 110, if they score 44 or better on the Mathematics (100/110) Placement Test. The interval is given as:

$$1) P(.754 < p < .906) = .95$$

We can expect with a 95% probability using (1), that between 75% and 91% of students will achieve a "C" or better in Mathematics 110 if they score 44 or better on The Mathematics (100/110) Placement Test.

Similarly we can create a confidence interval for the true percentage of all students who will receive a "C" or better in Mathematics 110 if they scored less than 44 on The Mathematic's (100/110) Placement Test. The interval is given as:

$$2) P(.33 < p < .59) = .95$$

Clearly, even after considering the confidence intervals, the success rate in Mathematics 110 is far greater for those students who scored 44 or greater on Mathematics (100/110) Placement Test.

BEST COPY AVAILABLE

In a similar fashion we can analyze failure rates. We found that of those students who scored 44 or better on The Mathematics (100/110) Placement Test 2% failed Mathematics 110. Whereas of those students who scored less than 44 on The Mathematics (100/110) Placement Test 19% failed Mathematics 110. The failure rate is almost ten times greater for those with less than a seventh grade arithmetic ability.

Confidence intervals can also be constructed for failure rates. A 95% confidence interval for the true percentage, p , of the students who fail Math 110 with a score of 44 or better on The Mathematics (100/110) Placement Test is:

$$3) P(0 < p < .048) = .95$$

So we can expect, with a 95% probability, that between 0% and 5% of the students who score 44 or better on The Mathematics (100/110) Placement Test will fail Mathematics 110.

Similarly, a 95% confidence interval can be constructed for those students who failed Math 110 and who scored less than 44 on The Mathematics (100/110) Placement Test. It takes the form

$$4) P(.09 < p < .29) = .95$$

So we see from (4) that we can expect, with a 95% probability, that between 9% and 29% of those students who scored less than 44 on The Mathematics (100/100) Placement Test will fail Mathematics 110.

Clearly, the failure rate in Mathematics 110, is significantly higher for those students who score less than 44 on The Mathematics (100/110) Placement Test.

Now, what happens to those students who received less than a 44 on The Mathematics (100/110) Placement Test and who were placed into Mathematics 100? The results are impressive. We found that 92% of these students received a "C" or better in Mathematics 100. This is, indeed, a far better success rate than for those students who took Mathematics 110 with a score of less than 44 on the Mathematics (100/110) Placement Test.

BEST COPY AVAILABLE

In light of the preceding data and analysis we feel that the use of The Mathematics (100/110) Placement Test is warranted. Clearly, with its use, students can be placed much more effectively in Mathematics 100 and Mathematics 110. It's continued use will alleviate much frustration on the part of the students and teachers.

BEST COPY AVAILABLE



U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)



REPRODUCTION RELEASE

(Blanket)

I. DOCUMENT IDENTIFICATION (Class of Documents):

All Publications: <i>The Effectiveness of Mathematics (100/110) Placement Test</i>	
Series (Identify Series):	
Division/Department Publications (Specify):	Publication Date: <i>1983-1984</i>

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to each document.

If permission is granted to reproduce and disseminate the identified documents, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

The sample sticker shown below will be affixed to all Level 2A documents

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 1



Level 2A



Level 2B



Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate these documents as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, → please

Signature: <i>M. V. Siadat, Ph.D.</i>	Printed Name/Position/Title: <i>Mohammad Vali Siadat / Professor of Math</i>
Organization/Address: <i>Richard J. Daley College 7500 S. Pulaski Rd Chicago, IL 60652</i>	Telephone: <i>(773) 838-7632</i> E-Mail Address: <i>VSIADAT@CCO.EDU</i> FAX: <i>(773) 838-7524</i> Date: <i>3/21/2000</i>



(over)