DESIGN AND APPLICATION OF EVALUATION PROCEDURES FOR THE SADDLEBACK COMMUNITY COLLEGE DISTRICT'S ASSESSMENT AND PLACEMENT PROGRAM

by

Steve Sworder, M.A.T.

Saddleback College

A Practicum presented to Nova University in partial fulfillment of the requirements for the degree of Doctor of Education

Nova University

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ABSTRACT

The purpose of this study was the design and application of procedures for evaluating the academic success of students involved in the Saddleback Community College District assessment and placement program. Further, it was the purpose of this study to design and apply procedures for evaluation of the placement instrument cut-off scores.

Based on a review of the literature and data from a District pilot assessment and placement project, seven specific evaluation elements were defined and applied. The use of scatter diagrams was found to be a particularly efficient means of determing cut-off scores. This method was used to identify both two tiered STOP/GO and three tiered STOP/CAUTION/GO type cut-off scores.

It was recommended that student withdrawal petitions carry an indication of the reason for the student's withdrawal from a class and that sufficient computer support be readied for a District-wide assessment and placement program. Also it was recommended that the assessment instrument be administered to a large number of classes for validation purposes and that any requirement for a measure of correlation between placement test scores and final course grades be discouraged.

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Chapter 1

INTRODUCTION

Nature of the Problem

In anticipation of State legislation that will "require a mandatory assessment, counseling, placement and follow-up program in the California Community Colleges" (Commission, 1986:6) the Saddleback Community College District began a pilot assessment and placement project in December 1985. A group of new students was asked to participate in this project. Those who consented were given a battery of assessment tests and counseling based on their test scores and academic goals. A follow-up study of the academic success of these students was needed to complete the final stage of the pilot project.

Purpose of the Study

The purpose of this study was the design and application of the procedures for evaluating the academic success of the students involved in a Saddleback Community College District assessment and placement program. Further, it was the purpose of this study to design and apply procedures for evaluating the placement instrument cut-off scores.

Method of Investigation

The typical evaluation elements for assessment and placement programs were identified from a review of the literature. The applicability of these elements was tested using the final course

of the students noted above who agreed to participate in the pilot project. A comparison was made between the academic success of those students who actually took the placement tests and those who decided not to complete the testing phase.

The literature suggested the use of scatter diagrams for analysis of the placement cut-off scores. To provide data on which to demonstrate this mehtod a set of mathematics and English classes took the corresponding part of the assessment instrument as a class exercise. These students' scores and final course grades were plotted on scatter diagrams and the analysis technique applied.

Chapter 2

BACKGROUND AND SIGNIFICANCE

Foundation for the Study

One of the results of student unrest in the late 1960's and early 1970's was a significant reduction in college testing, orientation, and counseling activities (Rounds and Anderson, 1984:3). Students demanded the right to make their own decisions and the right to fail (McCabe, 1985 and Cohen, 1984:6). It became clear, however, that student preparation for college work was often less than adequate. Ill-prepared and ill-informed students often made poor academic choices and performed poorly as a result of these choices. The focus of the 1980's thus shifted to quality and accountability with the trend toward student needs assessment and placement testing (Hector, 1984:4). Rounds (1984b:11) concludes that "the Age of Assessment is upon us."

Rounds and Anderson (1984b) conducted an exhaustive study of assessment practices in the California community colleges. Their study describes the wide variety of test instruments used and dominance of locally constructed tests for mathematics. This report concludes with a call for organized research which will validate the effects of what has been done in assessment and placement. Specifically, evaluation of the cut-off scores used for placement and follow-up and retention studies are needed. It is exactly to these areas that this practicum was addressed.

Relationship of the Study to the Seminar

Glasser (1972:309) believes that the central problem in education is the need for the individualization of instruction. A critical step in meeting this need is the assessment of each individual's learning style and ability followed by the appropriate choice or assignment of educational paths (Glasser, 1972:311). The District's pilot project was an attempt to begin this assessment process. Through proper course placement students have a better opportunity for learning to occur. Losak (1984:19) states that cognitive learning is made more difficult by undue stress and anxiety. He adds that when these components of the educational enviornment are reduced, the learning process is enhanced. That this is a significant problem at the community college can be seen in the observation by Robbins (1986:A3) that thousands of students drop out of community college each year because they are enrolled in classes that are too difficult for them. Effective assessment and proper placement will save many of these students by removing the stress and anxiety associated with taking classes for which they are not prepared. Assessment and placement is, thus, an integral part of the application of learning theory and, as such, is directly related to the Learning Theory and Applications Seminar.

Significance of the Study to the Saddleback Community College District

The results of this study will be incorporated into the final report to the District Board of Trustees concerning all aspects of the pilot project. Knowledge of the evaluation procedures will allow for

more effective planning of the data collection needs and costs for the follow-up portion of a large District-wide assessment and placement program.

Review of the Literature

Rounds and Anderson (1984b) completed an exhaustive study of the assessment activities in California community colleges. Responses to their inquiries were received from 99 of the 106 colleges in the California system. They found that only seven colleges pointed with pride to the research carried on at their institutions, although such research was often the basis for lauding the programs at other schools. This is true even though it was felt that empirical data was the only defensible basis for assessment of these programs. Forty-seven colleges made comments categorized as describing technical needs for their programs. Twenty-four of these needs were further identified as research needs and fully one-third of these were related to the search for more appropriate cut-off scores for advising purposes. Four others observed the need for general student follow-up and longitudinal research and two colleges requested increased information about retention.

Rounds (1984a) studied in depth the assessment practices at the four California community colleges most often identified with effective assessment and placement programs in the State by the other California community colleges. At Sacramento City College the testing instrument was considered very successful because it did a good job of predicting whether a student could earn at least a C grade. Follow-up studies on the five percent who refused to accept the placement recommendations indicated most were unsuccessful. At the time of the study, Sierra

College was in the process of validating the cut-off scores for its locally developed mathematics test. Follow-up studies at Sacramento City College found that assessed students were better retained than those who were not assessed in each of the 47 different classes studied. Another study compared the final grades of students who tested into English 1A with those who came up the ladder of previous courses. Indications were that the tested group had better success. Both Fullerton College and Victor Valley College were engaged in studies of the established cut-off scores.

Clearly the establishment of test cut-off scores is a major concern of assessment research. That this is likely to be addressed by each college individually can be seen from the State of California Mathematics Diagnostic Testing Project (1986:2) which refuses to recommend cut-off scores based on State-wide performance on their tests. Their newsletter states "We do not provide these scores because we believe that cut-off scores used for placement purposes should be determined separately at each campus." The need for this activity is further supported by the finding of Rounds and Anderson (1984a) that locally developed assessment instruments were more used than any single published instrument in all areas except reading.

In an evaluation of skills assessment at Victor Valley College, California Holton (1985) reports an upward trend in retention over the four semesters of assessment activity. She also concludes that assessment testing may be a factor in the decline in enrollment of new students. At the time of the report the College was compiling expectancy tools for success in certain courses based on assessment scores. Success was defined as a grade of C or better.

Cohen (1984) describes the evaluation of the assessment program at Santa Barbara City College, California. The effect of student performance was evaluated by comparing the student final course grade distributions in English, essential skills, ESL and mathematics classes between Fall 1982 (before the assessment program began) and Fall 1983 using the chi-square statistic. The fourth week to end of the semester attrition percent was compared between these same two semesters. Generally an improvement of grade performance occurred and there was a notable drop in attrition. The effect on attrition remained somewhat in doubt because of the overall College drop in attrition perhaps due to the newly instituted ten dollar per course drop fee.

In a review of the Assessment Center at Sacramento City College, California Haase and Caffrey (1985) found that the percent of students passing the developmental English course essay examination was beginning to increase. The students who receive A's and B's in transfer level courses possess 13+ grade proficiency levels in both reading and English.

Anthony (1985), in a review of the assessment and placement program at Santa Ana College, California, found that the course attrition percent dropped in most of the mathematics and English courses in which students were placed between Fall 1983 and Fall 1984. An attempt was made to determine the correlation between placement test scores and final course grades. No correlation was found for six of the nine courses studied. The correlation coefficients for the other three courses, which were all mathematics classes, ranged from 0.21 to 0.44. The entire study was viewed as framing guidelines for expanded participation in the program and not as an evaluation of the process. In a further review of this program Anthony and Slark (1986) found

that in 7 out of 25 selected courses tested students had a higher rate of success than did the untested.

Hector (1984) used the correlation coefficient to determine the effectiveness of certain placement tests in predicting final course grades in selected college level courses. A significant positive correlation was found in eleven of the twelve cases studied. Values ranged from 0.21 to 0.54. Cut-off scores were determined by using scatter diagrams to minimize the two errc . false positives and misses. Students receiving a grade of C or better in the course were considered successful. To improve faculty and student acceptance of the cut-off scores a three tiered system of placement recommendations was developed. The levels were STOP, CAUTION and GO. Students with scores in the CAUTION region were advised to look at their high school performance and other factors before deciding on course selection.

In response to challenges to the placement cut-off scores used at DeKalb Community College, Georgia by external sources, Johnson (1984) used the Pearson product moment correlation coefficient to show a significant correlation between SAT scores and the placement test results. Coefficient values ranged from 0.64 to 0.76.

Influence of the Literature Review on This Study

Rounds and Anderson (1984b) set the stage for this study with their call for investigations that address cut-off score selection, student follow-up and retention. Following Anthony's (1985) example it was the purpose of this study to provide guidelines for an expanded assessment and placement process rather than to evaluate the process at this early stage of development.

Several studies (Anthony (1984), Hector (1984), Anthony and Slark(1986)) used the Pearson product moment coefficient of correlation to compare course grades with placement test scores and consequently this measure was used in this investigation. It was common in the literature for grades of C or higher to be considered an indication of successful student placement (Hector (1984), Holston (1985) and Rounds (1984a)) and this was taken as the comparable measure in this investigation. Hector's (1984) use of the scatter diagram to determine the cut-off scores was the technical basis of the similar effort in this investigation. Simple percents were used extensively by Cohen (1984), Haase and Caffrey (1985) and Holton(1985) to compare the performance between different groups of students. That technique was also adopted here.

Chapter 3

PROCEDURES

Evaluation of the Academic Success of Assessment and Placement Participants

Participants

A member of the Admissions Office staff was asked by the Assessment and Placement Pilot Project Coordinator to invite new college students to participate in the project and take the assessment test battery. Contact was made with each new college student who applied for admission while this staff member was on duty between November 4 and November 27, 1985. Of the 131 students asked to participate, 124 agreed. The Admissions Office estimated that 650 new students were admitted during this portion of November. The set of students who agreed to participate in the pilot project was divided into two groups. The first group (called the program group) consisted of those students who took the assessment tests and followed the placement recommendation. The second group (called the control group) was composed on those who failed to attend any of the testing sessions and those tested students who placed themselves contrary to the counselor's recommendation.

Data Collection

A memorandum was sent to each mathematics and English instructor of students who agreed to participate in the pilot project that requested the students' final course grades. In those cases where there was no response, the appropriate Division Dean was contacted and supplied the

necessary information from the grade collection sheet submitted by the instructor. All assessment test scores were provided by the Pilot Project Coordinator.

Analysis of the Data

For both the program and control groups, the percent of those who enrolled in a mathematics class and completed it with a grade of C or better was calculated. The mathematics assessment and placement was considered effective if the program group's percent was higher than that of the control group.

Because English placement already required completion of a prerequisite course or passage of an English Department assessment examination, the English assessment and placement was considered effective if the completion percent (calculated in the same manner as for mathematics) of the program group was at least as high as the control group's completion percent.

Evaluation of the Placement Instrument Cut-off Scores

Participants

Five mathematics and six English classes taught by instructors interested in the pilot project gave the appropriate part of the placement instrument as a class exercise at the beginning of the Spring 1986 semester.

Data Collection

The tests described above were scored and placement recommendations noted. These materials were not returned to the students. In addition

to the test scores, the final course grades for each of these students was needed. A memorandum was sent to each instructor whose class participated in this project that requested a copy of their final grade sheet. In the event an instructor did not respond, the appropriate Division Dean was contacted and supplied a copy of the grade collection sheet submitted by the instructor. In order to compare the pilot project placement instrument for English with the other current placement devices, the transcript for each student whose class took the English placement test was obtained from the Records Office.

Analysis of the Data

For each class that took a placement test, the relationship between the final course grade and student placement test score was calculated using the Pearson product moment coefficient of correlation (Mendenhall, 1983;433) that was defined to be

$$r = SS_{xy} / \sqrt{SS_x SS_y} \quad .$$

A value of r greater than or equal to 0.4 was interpreted to mean that the placement tests provided some significant prediction of future success in that particular course.

As a means of evaluating the cut-off scores used for placement, two dimensional (test scores versus course grades) scatter diagrams (Byrkit, 1980:363) were constructed as suggested by Hector (1984:8) for each test group. Cut-off scores were found that yielded ten percent or less misses. A miss was defined to be a student who earned a D or F in a course in which the assessment instrument recommended placement. The percent of false positives was calculated for these cut-off scores. A false positive was a student who scored below the cut-off level for a

course but was successful in it. If the rate of false positives was ten percent or less, these cut-off scores would have placed 80 percent of the students correctly. A recommendation was then made to adopt these new cut-off scores. Otherwise, no change was recommended for the cut-off scores.

Following the suggestion of Hector (1984) cut-off scores for each test group using a three tiered system of placement recommendation, STOP/CAUTION/GO, that yielded ten percent or less misses and ten percent or less false positives were found. This was not originally proposed in the practicum proposal but was considered a valuable addition to the investigation based on Hector's (1984) reported success.

The three concurrent mechanisms for English placement (pilot project placement, English Department test and placement due to passing the prerequisite course) were compared using the results of the pilot project exams given in the mathematics and English classes noted above. After looking at the student's transcript and the list of students who participated in the pilot project, the most probable method of entry for each student was determined. The pilot project recommendations were compared with those of the other two methods. If the number of discrepancies was less than twenty percent, the methods were considered equivalent. If they were thought not to be equivalent, a recommendation to the English Department to review the consistancy of the three mechanisms was considered appropriate.

Limitations and Assumptions of the Investigation

The numerical results of this study were limited specifically to the assessment instruments used in the pilot project and the curriculum

design at the Saddleback Community College District during the the 1985 -- 1986 academic year.

It was assumed that students who took the assessment instruments made an honest effort to do well.

It was assumed that all data analysis was to be interpreted as merely illustrative examples of the evaluation process and not an evaluation itself.

Definition of Terms

The following particular terms were used extensively in this study.

Program group was those students who took the assessment tests and followed the placement recommendation.

Control group was those students who failed to attend any of the testing sessions and those tested students who placed themselves contrary to the counselor's recommendation.

A miss was a student who earned a D or F in a course that the counselor, based on placement test scores, would have recommended placement.

A false positive was a student who scored below the cut-off level for a course but passed it with a grade of C or better.

The Pearson product moment coefficient of correlation, r, was defined to be

$$r = SS_{xy}/\sqrt{SS_x SS_y}$$

The STOP/GO cut-off score was such that a student scoring below that value was given the recommendation to not enter the class (i.e. STOP).

Instead a course was recommeded for which that score was a GO.

The STOP/CAUTION/GO cut-off score was such that a student scoring below the STOP/CAUTION score was given the recommendation to not enter the class (i.e. STOP). Instead a course was recommended for which that score was a GO. A student who scored at or above the CAUTION/GO cut-off score was given the recommendation to enter the class. Otherwise the student scored in the CAUTION zone and was advised to look at their high school performance and other factors before deciding on the course selection

Chapter 4

RESULTS

Specific evaluation elements for an assessment and placement program were identified through a review of the literature. An example of each element was developed using data from the District's pilot assessment and placement project.

Evaluation of the Academic Success of the Assessment and Placement Project Participants

Evaluation Element 1 -- Mathematics Placement

For both the program and control groups, the percent of those who enrolled in a mathematics class and completed it with a grade of C or higher was calculated. The mathematics assessment and placement was considered effective if the program group's success percent was higher than the control group's percent.

As an example of the application of this evaluation element, it was applied to the 124 students who originally agreed to participate in the pilot project. Nine of the 34 students in the mathematics program group enrolled in mathematics courses and three completed their course with a grade of C or better. The program group's success measure was 33 percent. Twelve students in the mathematics control group of 90 students enrolled in mathematics courses and three students completed their course with a grade of C or better. The control group's success measure was 25 percent. The mathematics assessment and placement was considered effective because the program group had a higher percent with success.

Evaluation Element 2 -- English Composition Placement

For both the program and control groups, the percent of those who enrolled in an English composition class and completed it with a grade of C or better was calculated. The English assessment and placement was considered effective if the program group's percent was at least as high as that of the control group.

As an example of the application of this evaluation element, it was applied to the 124 students who originally agreed to participate in the pilot project. Ten of the 35 students in the English program group enrolled in an English composition course. Three of these students completed their course with a grade of C or better. The program group's success measure was 30 percent. Six of the 89 students in the English control group enrolled in an English composition course. Three of these students completed their course with a grade of C or better. The control group's success measure was 50 percent. The English assessment and placement was not considered effective because the control group had a higher percent of success.

Evaluation of the Placement Instrument Cut-off Scores

The following evaluation elements were applied to the placement instrument scores received by students enrolled in certain mathematics and English composition classes who took the placement instrument as a class exercise. These evaluation elements were necessary to determine the validity of the tests and cut-off scores used for course placement.

Evaluation Element 3 -- Value of Placement Instrument Scores as Predictors of Final Course Grades

The Pearson product moment coefficient of correlation (Mendenhall, 1983:433) was used to determine the correlation between the students' final course grades and scores on the placement instrument. A value of the correlation coefficient, r, greater than or equal to 0.4 was interpreted to mean that the placement test scores provided a significant level of prediction of future course grades in that particular class.

As an example of the application of this evaluation element, it was applied to the eleven classes (seven different courses) that were given the placement instruments as class exercises. Two of the mathematics courses showed a significant level of correlation. Two of the English courses had a significant level of correlation with the objective portion of the English placement test. No other significant correlation was found. The complete results were placed in Table 1.

Evaluation Element 4 -- Evaluation of the STOP/GO Cut-off Scores

Two dimensional (test scores versus course grades) scatter diagrams (Byrkit, 1980:363) were constructed for each course in which students were tested. The STOP/GO cut-off scores for each course that yielded ten percent or less misses were found. If this score also provided ten percent or fewer false positives a recommendation was made to change the cut-off score to this value. Otherwise no change was recommended for the cut-off score.

As an example of the application of this evaluation element, it

Table 1

Correlation Between Placement Scores
and Final Course Grades

Instrument	Course	Number of Students	Correlation Coefficient, r	Indication of Significance
Mathematics Level I	Arithmetic, Math 350	31	0.50	Significant
Mathematics Level I	Beginning Algebra, Math 351	23	0.38	Not Significant
Mathematics Level I	Intermediate Algebra, Math 122	10	0.15	Not Significant
Mathematics Level II	Pre-calculus, Math 2	10	0.54	Significant
English Objective	Basic Grammar, Eng 300	34	0.45	Significant
English Writing Sample	Basic Grammar, Eng 300	34	0.22	Not Significant
English Objective	Fundamentals of Composition, Eng 200	34	0.43	Significant
English Writing Sample	Fundamentals of Composition, Eng 200	34	0.23	Not Significant
English Objective	Principles of Composition, Eng 1A	34	0.08	Not Significant
English Writing Sample	Principles of Composition, Eng 1A	32	0.20	Not Significant

was applied to the seven courses which were given the placement instrument as class exercises. The scatter diagrams were constructed and placed in the Appendix. For three of the courses it was possible to find a cut-off score which yielded both missess and false positives at the ten percent level or less. The cut-off scores were the same as currently used for one of the courses and, thus, two recommendations for change were made. These results were summarized in Table 2.

Evaluation Element 5 -- Evaluation of the STOP/CAUTION/GO Cut-off Scores

Two dimensional (test scores versus course grades) scatter diagrams (Byrkit, 1980:363) were constructed for each course in which students were tested. A three tiered cut-off score system was defined.

Table 2

Evaluation of STOP/GO
Cut-off Scores

Course	Instrument	Number of Students	Existing Cut-off	Cut-off for 10% Misses	Resulting False Positives is ≤10%?	Recommendation
Arithmetic, Math 350	Mathematics Level I	31	3	7	No	No change in cut-off score
Beginning Algebra, Math 351	Mathematics Level I	23	12	16	No	No change in cut-off score
Intermediate Algebra, Math 122	Mathematics Level I	10	21	21	Yes	No change, current cut-off score
Pre-calculus, Math 2	Mathematics Level II	10	17	12	Yes	Change cut-off score to 12
Basic Grammar, Eng 300	English, Objective and Writing Sample	34	300*	200	No	No change in cut-off score
Fundamentals of Composition, Eng 200	English, Objective and Writing Sample	34	200*	1A	No	No change in cut-off score
Principles of Composition, Eng 1A	English, Objective and Writing Sample	32	1A*	200	Yes	Change cut-off score to 200

* Course recommendation was made by a counselor based on the composite English objective and writing sample scores

The STOP/CAUTION cut-off score that yielded ten percent or fewer false positives was found. The CAUTION/GO cut-off score that yielded ten percent or fewer misses was found. These two scores defined the three tiered, STOP/CAUTION/GO, system.

As an example of the application of this evaluation element, it was applied to the seven courses (eleven classes) which were given the placement instrument as class exercises. The scatter diagrams were exactly those found for evaluation element 5. The cut-off scores for each course using a three tiered system were placed in Table 3.

Evaluation Element 6 -- Evaluation of Placement Consistency Between the English Department Test and the District Placement Test

The English course placement recommendation made by the District placement instrument was compared with the placement recommended for those who entered the tested classes via the English Department test. The number of discrepancies was counted. If the number of discrepancies was less than 20 percent, the methods were considered equivalent. If

Table 3

Evaluation of STOP/CAUTION/GO
Cut-off Scores

Course	Instrument	Number of Students	STOP/CAUTION Cut-off Score	CAUTION/GO Cut-off Score
Arithmetic, Math 350	Mathematics Level I	31	2	7
Beginning Algebra, Math 351	Mathematics Level I	23	12	16
Intermediate Algebra, Math 122	Mathematics Level I	10	20	23
Pre-calculus, Math 2	Mathematics Level II	10	14	20
Basic Grammar, Eng 300	English, Objective and Writing Sample	34	ESL	200
Fundamentals of Composition, Eng 200	English, Objective and Writing Sample	34	300	1A
Principles of Composition, Eng 1A	English, Objective and Writing Sample	32	200	200

they were thought not to be equivalent, a recommendation sent to the English Department to review the consistency of these two assessment devices was appropriate.

As an example of the application of this evaluation element, the 41 English 200 and English 1A students placed using the English Department exam who took the District English assessment instrument as a class exercise were considered. There were 41.5 percent discrepancies. A memorandum to the English Department notifying them of the apparent inconsistency between the tests would have been appropriate. It would have pointed out that the assessment instrument placed 31.7 percent lower and 9.8 percent higher than the Department test.

Evaluation Element 7 -- Evaluation of the Placement Consistency Between Prerequisite Course Success and the District Placement Test.

The English course placement recommendation made by the placement instrument was compared with the placement recommended for those who entered the tested classes through success in a prerequisite course. The number of discrepancies was counted. If the number of discrepancies was less than 20 percent, the methods were considered equivalent. If they were thought not to be equivalent, a recommendation sent to the English Department to review the consistency of these two assessment devices was appropriate.

As an example of the application of this evaluation element, the 34 English 200 and English 1A students placed by prerequisite course success who took the District English assessment instrument as a class exercise was considered. There were 73.9 percent discrepancies. A memorandum to the English Department notifying them of the apparent inconsistency between the two placement devices would have been appropriate. It would have pointed out that the assessment instrument placed 61.7 percent lower and 11.8 percent higher than the prerequisite course ladder.

Chapter 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

Discussion

A set of evaluation elements which could form the basis for the evaluation of a large scale District assessment and placement program was defined and demonstrated by example in the previous chapter. These examples pointed to a few potential weaknesses with some of the evaluation elements. If these weaknesses were removed the value of the evaluation elements would be significantly increased

The evaluation of the academic success of the assessment and placement participants treated all students who withdrew as unsuccessful. It would be desirable to remove consideration of students who withdrew for personal reasons unrelated to their academic ability to complete the course. This would be possible if a reason for withdrawal was recorded for each student drop petition.

As Anthony (1985) had previously observed, there was little correlation between the placement test scores and final course grades. Although the correlation coefficient is a common evaluative technique, its weakness in this application is not surprising. The correlation coefficient provides a measure of the degree to which one quantity (such as final course grade) changes in a proportional manner with another quantity (such as placement test score). If both quantities increase together with the same ratio of change (i.e. have a linear relationship), the correlation coefficient, r, equals 1. If there is no such linear

relationship, r equals zero. If there is a tendency for the quantities to increase together in only a vague linear fashion, r will range somewhere between zero and one.

It would be expected that the higher a student's score on the assessment test, the higher would be that student's grade for the course in which he was placed. It is thus common practice to call upon the correlation coefficient to give a quantitative measure of this relationship. There is a danger here, however. Because of the limited number of final course grade categories available (i.e. A,B,C,D,F) an initial linear relationship may become bent as students with ever higher placement test scores receive final course grades of A. An example of this is present in the District pilot project data. The Basic Grammar (English 300) students who took the objective portion of the English composition placement test had scores which ranged from 5 to 35 even though the cut-off score to move on to the next higher composition course was 19. A nice linear relationship (and r close to 1) between grades and scores up to 19 might be expected, but beyond that each student would be expected to receive an A. Even though the test scores increase, the final course grade can not increase and the previous linear relationship is broken and the value of r decreases.

This is not the only potential problem with using correlation in the context described above. Because of the wide variety of grading practices, final course grades may be a poor choice as a measure of student achievement. Aubrecht (1979:3), for this reason, found grades a poor choice as a measure of student progress on which to judge teacher effectiveness.

The purpose of the assessment test used in this investigation

was to measure readiness for a course. It had no ability to judge student motivation, dedication, desire and personal availability to do well in the course. It thus seems unreasonable to ask more from the testing instrument than to provide a threshold past which the student is declared competent to enter into the study of a particular level of material.

With all of this in mind it is doubtful that the correlation coefficient between placement test scores and final course grades (evaluation element 3) should be retained as an evaluation element.

The use of scatter diagrams to determine cut-off scores, as suggested by Hector (1984), was shown to be a straight forward process. Concern for the inflexibility of a single STOP/GO cut-off score was countered with the introduction of a three tiered STOP/CAUTION/GO system. Although the recommended cut-off scores are easy to calculate, the entire set of scores should be examined as a whole for consistency before changes are adopted. For example, using the data from the pilot project, the three tiered system yielded lower required readiness skills for Principles of Composition (English 1A) than for its prerequisite course, Fundamentals of Composition (English 200). This situation might suggest review of the appropriateness of the assessment instrument for English 1A placement.

Implications

This study has given the framework for the evaluation of the District assessment and placement program. It can thus be used as a planning tool for District management to determine the allocation of resources necessary to complete such a task. Although the evaluation

techniques are relatively simple, a large amount of data would have to be collected and manipulated efficiently to allow success of the program on a District-wide scale.

In each case were the evaluation of a specific assessment program was described in the literature, the program was found to have a positive influence on student achievement and retention. Such an impact is thus likely in this District. This will result in more efficient use of the institution's educational resources and the students' time and effort. Ultimately an even further improvement in the educational process of the Saddleback Community College District should be realized.

The literature clearly points to the need of all California community colleges to enter into the task of assessment and placement programs and placement cut-off score establishment. This study should provide assistance to other colleges new to this student service area.

Recommendations

Several recommendations are offered as measures which can increase the effectiveness and convenience of the evaluation process.

The assessment instruments should be administered to a large number of classes over the next several semesters. Only in this way can valid placement cut-off scores be established.

Student withdrawal petitions should carry an indication of the reason for the action (i.e. personal, academic, etc.). With this information in hand the academic success of the program participants can be more accurately determined.

No attempt should be made to correlate placement test scores

with final course grades. As discussed earlier, the correlation coefficient is not appropriate for this task. Also it is not the job of the test to predict the level of eventual success but just the readiness for the content of a particular course.

A computer program should be acquired that can search the student data base and pull out the final course grades for students indentified as participants in the assessment and placement project. The methods of data collection used in this small pilot project would strangle any large scale effort.

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APPENDIX

PLACEMENT TEST SCORES VS.FINAL COURSE GRADES
SCATTER DIAGRAMS

Final Course Grade	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
A	0	0	0	0	0	1	1	0	2	1	0	1	0	1	3	1	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	2	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	2	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	1	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
NCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	1	0	0	0	2	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
DR	0	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Math Level I Test Score

Figure 1

Scatter Diagram for Arithmetic (Math 350) Students

Final Course Grade	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	1	1	1	0	0	0	0	0
C	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	1	1	1	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
NCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
DR	0	0	0	0	2	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0

Math Level I Test Score

Figure 2

Scatter Diagram for Beginning Algebra (Math 351) Students

Final Course Grade	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
A	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0	0
C	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
NCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	0	1	0	0	0	1	1	0	0	1	1	2	0	1	0	0	0	0	0	0	0	0	0	0
DR	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

Math Level I Test Score

Figure 3

Scatter Diagram for Intermediate Algebra (Math 122) Students

Final Course Grade	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0
C	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
NCR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	0	0	1	0	0	0	0	0	0	0	[illegible]	0	0	1	2	0	0	0	0	0	0	0	0	0
DR	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

Math Level II Test Score

Figure 4

Scatter Diagram for Pre-calculus (Math [illegible] St[illegible]nts

Final Course Grade	ESL	300	200	1A
A	2	2	2	1
B	2	4	2	1
C	0	4	7	0
CR	0	0	0	0
D	1	1	1	0
F	0	4	0	0
NCR	1	0	0	0
I	1	0	0	0
W	1	1	3	1
DR	0	1	0	0

Recommended English Placement

Figure 5

Scatter Diagram for Basic Grammar (Eng 300) Students

Final Course Grade	ESL	200	300	1A
A	1	0	8	6
B	0	2	6	1
C	0	1	1	0
CR	0	0	0	0
D	0	1	1	1
F	0	0	5	1
NCR	0	0	0	0
I	0	0	0	0
W	2	1	2	0
DR	0	0	0	0

Recommended English Placement

Figure 6

catter Diagram for Fundamentals of Composition (Eng 200) Students

Final Course Grade	ESL	300	200	1A
A	0	0	6	5
B	0	1	9	3
C	0	0	5	1
CR	0	0	1	0
D	0	0	0	0
F	0	0	1	0
NCR	0	0	0	0
I	0	0	1	1
W	0	0	3	0
DR	0	0	3	2

Recommended English Placement

Figure 7

Scatter Diagram for Principles of Composition (Eng 1A) Students