

# **DEVELOPING A PROFESSIONAL STANDARD OF CARE FOR ACADEMIC ADVISORS OF STUDENT ATHLETES: USE OF INFORMATION BASED FORMATIVE EVALUATION IN ACADEMIC SUPPORT**

by

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## **Abstract**

Assisting ill prepared student athletes, many of whom are recruited from our nation's inner city schools, in their adjustment to a rigorous college level academic program is a formidable challenge for an academic support program. This study attempts to underscore the need for establishing, what might be termed, a "standard of professional care" for academic support personnel that is based on the formative evaluation of the student athlete's instructional needs. In this study the use of the information referenced testing (IRT) concept for addressing student athlete information needs is explored and the results of an experiment involving several N4A institutions are reported.\*

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\* The author is extremely grateful to the UCLA athletic department (Judith Holland, Joe Ward) for providing initial encouragement for using the IRT concept for its student athletes (see Bruno, Holland, & Ward, 1987). Special thanks to the wonderful cooperation and enthusiastic support from the N4A institutions that participated in the 1988 IRT experiment reported in this study. Academic advisors and support personnel from Louisiana State University (Jeff Orr), Indiana University (Anitra House), University of Oregon (Twinkle Morton), California State University-Fresno (Martha Wilson), University of California-Berkeley (Bruce Cohen), University of California-Los Angeles (Fred Stroock), and the California Community Colleges: Mt. San Antonio (Evans Roderick), Pasadena City College (Robert Cody) and Los Angeles Southwest Community College (Lise Spillman) coordinated the delivery IRT program at their school and made significant practical suggestions in using IRT for academic support.

## A. INTRODUCTION

The academic support of the student athlete poses a major professional challenge for athletic department academic support and counseling programs. The problem of having ill prepared (information wise) student-athletes attend our colleges and universities has precipitated recent NCAA policies and legislation in this area—notably proposition 48 (specifically rule 5-1-J which requires that a student athlete must have a minimum score of 700 on the SAT and a C average in a core of 11 high school courses in order to compete as freshman) and the more recent NCAA proposition 42 (governing scholarships for freshman student athletes who do not meet the standards expressed in proposition 48). The academic preparation issue regarding student athletes has also been given wide attention in the news media (Newsweek, 1989). Unfortunately much of this attention has been negative and has caused serious embarrassment to the college, the NCAA and to the student athlete. But from a policy perspective one should question whether we are concerned about the innate abilities of these student-athletes to do college level work or the information base that these student-athletes possess to do college level work. These are separate questions that require further professional understanding and delineation by the NCAA. Research in the area of student academic attainment seems as clear as any finding in the social science literature, namely that the latter problem of an “unstable” information base usually dominates over standard measures of innate ability or aptitude such as the SAT in predicting attainment.\* The subsequent academic attainment of most students — especially inner city students whose instructional program and high school preparation is at best “suspect,” (Bloom, 1981; Hunter, 1985) is heavily dependent upon information. While innate ability might permit the student to perform academic tasks quicker and possibly at a superior level of quality, it is usually the lack of information or misinformation (knowing wrongly) which places the greatest barrier to the educational attainment of most students.

Over the past several decades, the Scholastic Aptitude Test (SAT) has been represented as a “scientific” filter or *prima facie* evidence for screening students for college admission. The notion of “scholastic aptitude” formed the theoretical and moral justification for using the SAT for admission. The NCAA now relies on these SAT measures, in part, for formulating policies which are used to determine athletic eligibility (proposition 48 and 42) of the student athlete. The combined SAT scores of 700 on both SAT Verbal (350) and SAT Quantitative (350) or the 3rd percentile (97 out of 100 students score higher) is set as the minimum academic standard

\* An excellent case in point is Tony Rice, quarterback at Notre Dame who although scoring 690 on the SAT, is performing well as a psychology major (Newsweek, January 30, 1989). There are numerous other cases (both student-athlete and regular student) where students are “outperforming” what the SAT has predicted.

for a freshman student athlete to participate in sports. One might legitimately argue if the 3rd percentile is worthy of even being considered as a standard. An SAT score of 700 is in reality an arbitrary figure with little instructional or educational significance. Clearly, many student athletes do not perform well on tests that are specifically designed to produce a normal distribution of scores. These types of tests, called norm referenced tests tend to favor, regardless of innate aptitude, “information rich” academically prepared students from excellent instructional high school programs. The questions asked on a typical SAT exam are not basic “information” type questions, but trick questions or riddles that have a built in “difficulty” factor. A factor that is essential for ultimately achieving a normal distribution of scores. The SAT is thus a “norm” referenced test and not a “criterion” referenced test as many are led to believe. In psychometric terms, this property of a test item is called discriminant validity. If too many students get a particular test item correct on this type of exam, then the question is deleted from future exams. Ability to correctly answer these “riddles” on the SAT is assumed to be predictive of college aptitude and performance. This assumption is extraordinarily difficult to test (either way) since there are multitude of important factors which might influence the academic attainment for a specific student.

Recently the SAT has come under extreme negative criticism and research scrutiny. Psychometrically, the “myth” of Scholastic Aptitude is being exposed as a sham (Owen, 1985). Socially (Nairn & Nader, 1980; Olson, 1987), economically (Hill, 1987; Princeton Review, 1988), legally (Bruno & Hogan, 1985; Fairtest, 1989; Neill and Medina, 1988), and culturally (with its possible gender bias against female students [Rowe, 1987]), the SAT has come under attack.\* Surprisingly, girls do poorer than boys on the SAT yet have higher graduation rates and GPA's in college. Even SAT researchers are at loss to “explain” this phenomenon. SAT test scores have also been found or at least suspected of being significantly affected by test preparation (Princeton Review, 1988). This phenomenon introduces an element of economic bias in addition to possible gender and cultural bias. If test wiseness or test preparation (White, 1985a, 1985b, 1985c) rather than knowledge is an important factor in the determining the final SAT score, then these tests can be considered as inherently slanted against inner city minority students who can't afford to “purchase” this important information. In short, if tests such as the SAT are psychometrically, socially, or economically flawed (according to some researchers), why aren't NCAA policies which affects so much of the life of a student athlete (when and where he or she goes to school, if they will compete in sports, and which in turn affects how much they will earn in the future, where will they live and ultimately even, who will they marry, etc.) not receiving the utmost

\* Fairtest is presently contemplating legal action against the NCAA for using the SAT for determining eligibility (see NCAA News, January 18, 1989).

research and professional scrutiny from the NCAA (see Owen, 1985 and Nairn & Nader, 1980). Most likely, the SAT is used because there is nothing else "available" that is better to use as a common measure for determining eligibility.

The SAT is also considered as "scientific" and "objective". Yet it is only the scoring of the test (optically scanned) that is objective and the "science" is based on an extremely narrow view of aptitude. (Neill and Medina, 1988) These issues aside, it is important, for public relations purposes, to show that something is being done by the NCAA regarding the college admission of poorly prepared student-athletes.\* If one views the challenge of the ill prepared student athlete in an affirmative mode, then possibly we should pay less attention to the score received on a very suspect type of exam (such as the SAT) and more attention to auditing (then addressing) the actual information base of these student athletes. While the former (the SAT) might predict (in a few cases) who will get the A's in college, the latter type of testing procedure (information audit with intervention) might better assist the student athlete in deriving educational benefit from their college experience. Certainly competence in the basic skill areas (information wise) are necessary and should be considered as fundamental for the future academic attainment of the student athlete. For student athletes to derive the maximum benefit from their investment in school—education not a diploma, mastery of basic skills is essential.\*\*

## B. PUPOSE

In the summer of 1988 (and continuing in the summer 1989), a small group of N4A institutions explored the use of a new type of testing procedure called information referenced testing (IRT) for the academic support of its student athletes. Preliminary designs of the IRT concept applied to student athletes was reported in to the N4A's Academic Athletic Journal (Bruno, Holland, & Ward, 1987). The goal of this research was not only to derive more sophisticated measures which might have better "predictive" qualities (how well would the student athlete perform in school), but better "diagnostic-prescriptive" qualities. The effort here was not to focus and

\* Certainly the fact that other students are admitted to the university based on their SAT scores gives rise to the notion of a double standard. Many would argue that the SAT should not even be used for regular college students (Owen, 1985, Nairn & Nader, 1980). Many schools have dropped the use of the SAT (Chronicle of Higher Education, 11/11/87) and the president of the ACE has gone on record as seeking an end to the use of standardized tests in admissions (Chronicle of Higher Education, 11/25/87).

\*\* Suppose a student athlete was attending the Julliard School of Music and didn't know how to read music. While the student athlete might eventually get a degree from Julliard, he or she would certainly not get a Julliard education. There is a major qualitative difference between a diploma and an education.

concentrate only on the statistical significance of the procedure (in prediction) but the educational significance (what can be done to actually help the student athlete). In short, we were exploring the use of a procedure which might have an affirmative, proactive, and "opportunity" for educational intervention type of quality. This latter feature of an assessment program is extremely important for academic support personnel since many student athletes come from (1) homes with low human capital investments (educational level of parents), (2) homes that are generally information poor in terms of the basic skills, and more importantly, (3) schools where they were advanced through the various grade levels with almost no systematic formative evaluation (the monitoring process by which we can ascertain if a student is actually learning). Unfortunately, the phenomenon of "social" promotion, not "information" promotion, is most evidenced at the same inner city schools that are producing many of the "blue chip" student athletes for NCAA schools. Huge numbers of students from these schools (athlete and nonathlete) thus have significant gaps and misinformation in their information and knowledge bases.\* In short, many students, including student athletes, fall through the cracks in many inner city instructional programs since there is no formal mechanism (either at home, or at school, or with their peer group) to determine if these students have a reliable information base upon which to base future learning. The culture of poverty in the inner city produces large numbers of students who "drop out" and student athletes who would under most circumstances "drop out" if they weren't participating in a sports program. The students, including the student athlete, are not only economically poor, but are information poor as well.

## C. THE INNER CITY STUDENT ATHLETE

In an excellent article on how testing affects inner city, low-achieving students, James Raffini (1986) postulates that students defend their ego by developing a sense of apathy towards school — especially testing. In

\* It is extremely unfortunate that due to the failure of many large urban school districts to deliver a quality instructional program, the NCAA has to address the problem in a higher education environment. The process of insuring that student athletes possess the "basic skills" should begin in elementary school (where it is far easier to solve), not in college. While the total number of student athletes in the proposition 48 category (below 700 on the SAT mainly) is low (estimated at approximately 600), most of these student athletes are black from inner city schools and in the two highly visible and revenue producing college sports of basketball and football. Issues surrounding the enforcement of proposition 48 raised questions of discrimination and possible racism. The problem is exceedingly complex and underscores the "equal opportunity" vs. "academic preparation" tradeoff question. The NCAA might entertain "taking charge" of the academic preparation of student athletes from inner city schools by sponsoring formative evaluation type programs beginning as early as Junior High School. As these students begin to "bond" to sports skills they should also begin a parallel bonding to academic skills. In terms of equal opportunity it will also present a wider range of college choices for the student athlete upon graduation from high school.

addition to the apathy problem, most of these inner city students are not empowered with information to do anything to improve their learning situation. Their bonding, therefore, to educational institutions and values is extremely weak because of poor information in the basic skill areas.

Raffini postulated the direct relationship between academic achievement and self-esteem. The bottom line for the student is that it is not too "satisfying" to be in an education "game" where you are constantly "humiliated" because you don't have the skills and information necessary to participate and attain.\* As Raffini (1986) states:

Below average students protect themselves against failure in an educational competition they cannot win. But they could win if schooling tied success to effort, time on tasks and performance standards—rather than ability.

#### D. STANDARD OF CARE FOR ACADEMIC SUPPORT

The challenge expressed by the above situation for advisors in academic support programs is to define what might best be described as a "standard of professional care" for working with the ill prepared (information base) student athlete. The centerpiece for the "standard of care" is enhanced formative evaluation or sophisticated and systematic audits of the actual information base of the student athlete. What is proposed here is a medical view of assessment and testing for academic support. With this type of model students can respond to assessment questions with an I don't know, I am sure, I am nearly sure, etc. or "less restrictive" type of response. What is produced with this procedure is not a grade equivalent or percentile score, but an individually prescribed education plan (IEP)—or a plan of action based on an information referenced, and not a norm referenced standard. The IEP further empowers the student athlete to being the process of addressing the needs of his/her own particular information base using the information referenced standards (not guessing) of being informed, partially informed, misinformed, or uninformed for evaluation.\*\*

\* Many researchers, feel that testing can in some be viewed as a legalized form of "child abuse" since it devastates the morale and self esteem of children without giving them the necessary feedback to improve their situation.

\*\* An analogy of formative evaluation in the private sector might be an eye examination where the patient guesses or squints at one of four letters on an eye chart. Imagine that the patient bubbles in the letter and the doctor tries to determine a prescription for eye glasses from the responses on the answer sheet. Recognition and confidence in the recognition of the letter (not just recognition) is required for effective information based formative evaluation. IRT attempts to follow this type of "confidence" model by employing a sophisticated computer based scoring system. The procedure is also optically scannable and takes little additional time compared with present practices. See Bruno, 1988 for more details regarding the scoring system.

The ultimate professional objective of academic support personnel therefore should be not merely a diploma (reactive tutoring to get the student athlete through school) but an education (proactive tutoring to address basic information needs to derive benefit from the schooling experience).

From an organizational perspective three important forces or interest groups are involved with the academic support objectives of the athletic department. Each has its own concern, which if not professionally addressed, will impact on the athletic department's academic support program in a detrimental manner.

- A. The faculty member who has to deal with ill prepared student athletes in class. This legitimately leads to professors having a lowered satisfaction with teaching and makes the athletic department support services suspect. It damages the reputation of the university.
- B. The coach who has to win ball games with these academically ill prepared student athletes. Coaching satisfaction is lowered when games are lost because of the lack of availability of certain talents. It damages the athletic department sports program.
- C. The student athlete who must eventually deal with an "information rich" society or world. Lowered satisfaction of the student athlete with school because of social promotion and an unreliable information base (misinformation, lack of information, and partial information) to get something out of the courses being taken. It damages the student athlete's ability to compete outside of sports and to make a contribution to the community.

The academic advisor thus become the tri-part bridge to these three parties and the professional standard of care must include strategies which increase the satisfaction of each.

Consider for a moment the concept of educational bonding.

Bonding or Commitment (in direct proportion)	Satisfaction (happiness, recognition, rewards, sense of purpose, etc.)
Bonding or Commitment (in inverse proportion)	1
	Time — Resource Effort (study skills, preparation, work habits, etc.)

$$\text{Bonding} = \frac{\text{or Satisfaction (S)}}{\text{Time — Resource Effort (T)}} = \frac{S}{T}$$

Using the above relationship we can define four important classes of student athletes. Each classification presents difference challenges for academic support personnel.

$\frac{S \uparrow}{T \uparrow}$  = Maximizes— They want to get something out of school, but are so “inefficient” that school consumes too much effort and they get discouraged eventually and “burn out” of the instruction program.

$\frac{S \downarrow}{T \uparrow}$  = Dissatisfier— This student athlete gets little satisfaction from (Drop out) school and is also technically inefficient (poor study habits, preparation, etc.). School is not (no effort) worth the effort and he or she eventually fails or drops out of the instruction program.

$\frac{S \downarrow}{T \downarrow}$  = Satisfies— This student athlete is not getting much out of (Minimal effort) school, but is technically efficient in just getting by and gets a diploma but a poor quality education.

$\frac{S \uparrow}{T \downarrow}$  = Optimizer— This student athlete is not getting much satisfac- (Optimal effort) tion out of school but is also technically efficient with regards to the effort. This type of student athlete should be our goal.

A standard of care for academic support personnel would attempt to increase  $S \uparrow$  while decreasing  $T \downarrow$  or enhance the technical efficiency (Time-Response-Effort) in the student-athlete. An information base “audit” of the basic skills is one mechanism for making student-athletes more technically efficient. Using the results of the information audit for “proactive” interventions, the S/T Ratio can be increased dramatically for most student athletes. Since the currency, by which the student athlete purchases the information needed to pursue their own personal career objectives ( $S \uparrow$ ) is the basic skill areas—mathematics, language, and reading the formative evaluation process is essential. To stimulate human capital formation in student athletes so that they can make an optimal investment in school thus becomes the general major behavioral objective of the academic support program.

### E. INFORMATION REFERENCED TESTING AND ACADEMIC SUPPORT

As previously noted, the information referenced testing (IRT) is designed using the concept of a medical model of assessment. With IRT, not only is the recognition of the answer important, but confidence in that recognition is equally important. The questions asked on IRT assessment

are not “riddles,” as with the SAT type exam, but basic fundamental information based questions needed for college level work. These questions tend to define the currency needed to “purchase” the information presented in various career path options (academic majors) available to the student athlete.

The IRT program focus is presently in the assessment areas of reading, language arts, and mathematics information. The IRT analysis attempts to determine, with a unique test scoring system called MCW-APM, where a student athlete is informed, misinformed, uninformed, and partially informed.\*

The IRT assessment program produces a specific diagnostic prescription or an individual education plan (IEP) using an information referenced standard (informed, uninformed, misinformed) for each student athlete. The IEP contains detailed instructional cross references to assist athletic department tutors in their “proactive” work with the student athlete.

The IRT analysis also produces a specific information base profile for all the student athletes examined so that the athletic department can design its own “customized” special review classes and workshops before the beginning of fall classes. Both types of IRT analyses will be described, in more detail, later in the discussion.

### F. IRT 88 RESULTS

The following institutions participated in the summer, 1988, information referenced testing experiment.

	# of Students	# of Exams	Total
UCLA	32	4	128
UCB	35	4	140
U of O	27	4	108
IU	35	4	140
LSU	28	4	112
CSU	18	6	108
MTSAC	18	4	72
PCC(F)	23	4	92
PCC(S)	30	4	120
SWCC	49	4	196
LHS	52	4	208
Total exams			1,404

\* Modified Confidence Weighted-Admissible Probability Measurement or MCW-APM is a modification that is derived from the more generic APM (Admissible Probability Measurement) type testing. The Rand Corporation in the early 1970s, provided much of the theoretical research into this type of information based on APM testing (Brown, 1970; Brown & Shuford, 1973; Sibley, 1973; Shuford & Messingale, 1966; Bruno & Shuford, 1973). Recent research in MCW-APM test scoring includes applications to policy-legal issues (Bruno & Hogan, 1985), below grade level students (Bruno, 1986), special action admissions (Bruno, 1988) and test-retest reliability (Albedi, 1988).

While it is difficult to determine the full, ultimate impact of IRT on the student athlete, the reactions were generally very positive. With regard to the MCW-APM type test scoring system, as compared to the traditional Right-Wrong (R-W) test scoring, the following results were obtained when student athletes were asked the following questions.

Which procedure provides the teacher (academic advisor) a more accurate picture of what you really know?

	Number	Percent
R-W	71	12
MCW-APM	385	68
Either	77	13
Neither	34	6

Which system would you prefer to use in the future?

	Number	Percent
R-W	78	13
MCW-APM	386	67
Either	81	14
Neither	27	5

Which system provides the best information for the academic support program to help you in school?

	Number	Percent
R-W	56	10
MCW-APM	438	77
Either	48	8
Neither	23	4

Is the MCW-APM scoring procedure as easy to use as R-W?

	Number	Percent
Yes	365	65
No	193	34

How many minutes did it take you to learn the MCW-APM procedure?

	Number	Percent
0-5	332	58
6-10	141	24
11-20	53	9.3

Examining specific large N4A institutions the following high acceptability of IRT among student athletes was obtained:

"Best Information For Teacher"

	RW (Right Wrong)	MCW-APM (Information Referenced Testing)
UCLA	5	22
UCB	4	28
U of O	4	19
IU	7	20
LSU	5	19
CSU - Fresno	2	14
MT SAC	2	15
SWCC	3	41
Total	32	178
Percent Acceptable = 84%		

In summary, student acceptability of MCW-APM was excellent. Both the IRT concept (using MCW-APM) and its use in formative evaluation and proactive tutoring by the athletic department was rated approximately 8:1 over present assessment methods.

Academic support program personnel acceptance was also high. IRT was viewed as a cost efficient and accurate procedure for the formative evaluation (see later discussion) of the student athlete and for generating information needed to design appropriate instruction interventions.

In the 1988 study, student athletes took the same examination with both the traditional R-W and the IRT test scoring MCW-APM formats. The study found that there were enormous amounts of important formative evaluation information that were filtered with presently used R-W assessment methods. This finding underscores the severe limitations of assessing (in terms of accuracy), the student athlete's knowledge or information base with forced choice traditional R-W test scoring methods.

Note the range of confidence in "correct" information for different ranges of R-W scores. At ranges of 70 to 80% correct using the R-W procedure, the actual confidence in correct information for these student athletes is in the unstable region (.33 = a random guess). Many of the student athletes had actual confidence in incorrect information (see Figure 1) yet scored between 70 and 80 on the R-W exam. Thus, the very group of students, most in need of an accurate assessment of their information base, has the largest "error" associated with its assessment. This confirms similar findings in the psychometric literature (Doscher & Bruno, 1987; Wick, 1983) as well as the perceptions of the student athletes used in this study (see above).

## G. STUDENT ATHLETE INDIVIDUAL EDUCATION PLAN

The most important output in the IRT procedure is the student athlete individualized education plan (IEP). The IEP is used by both the student athlete and the assigned tutor for diagnostic and prescriptive intervention purposes. The specific student athlete areas of misinformation, lack of information, etc., with detailed instructional cross references are presented in the IEP. The IEP also provides an overall information referenced assessment and summative (for predictive purpose) evaluation. The specific intent of the IEP is for formative evaluation and is used to build reliable information in the information base of the student athlete. A typical IEP produced by the IRT procedure can be found in Figure 2.

The athletic department also receives an information referenced profile that clusters all IEP's across all student athletes examined. This IRT analysis depicts common areas of misinformation, lack of information and, partial information. This analysis is used by academic support personnel in designing specific instructional objectives for classes, special seminars, and review sessions. A typical information profile type of analysis for an athletic department is depicted in Figure 3.

Finally, a summative evaluation of the information state of the student athlete is prepared. The information is used for purposes of matriculation, counseling, and advisement into certain courses or sections. This IRT analysis clusters all IRT assessments across one student athlete, then lists the student athletes alphabetically. The analysis also ranks, each student athlete in terms of levels of reliable information across all areas assessed. A sample clustered summative evaluation is depicted in Figure 4. An information referenced standard of mastery (informed, misinformed, uninformed, partially informed) is used as the basis of the IRT summative evaluation.\*

## H. INSTITUTIONAL EVALUATION

Participants at the N4A session on IRT in San Francisco, (1989) who used IRT this past summer (1988), were in unanimous agreement regarding the value of the IRT program for Academic Support and wanted to see it continued. Many felt it addressed a genuine need in academic support, especially for the "at risk" blue chip inner city student athlete. These were the specific advantages cited by last years (1988) users of IRT.

\* When asked if they would like to see the IRT program used in the future, over ninety percent of the student athletes surveyed favored the use and continuation of the IRT procedure by the academic support program of their Athletic Department.

- An excellent affirmative method for articulating to across campus departments, the sophisticated manner in which the athletic department is assisting its student athletes.
- IRT has all but replaced costly previous diagnostic academic support procedure used by the campus. It allowed us to focus and target our own resource to address specific student athlete information needs.
- The design IRT program and its scoring system seemed to generate less test anxiety on the part of the student athlete than our regular testing programs.
- The Individual Education Plans or the IEP's generated by the IRT procedure served as an excellent mechanism for articulating and coordinating our tutorial services. It made the academic tutorials extremely cost efficient by minimizing instructional "down time."
- The IRT concept not only provided predictive information about a student athlete but information needed for designing effective instructional interventions (formative evaluation).
- The IRT concept is affirmative, proactive for the student and cost efficient for the athletic department, especially with its use of detailed instructional cross references in the IEP.
- The use of IRT for academic support is being used as an effective tool for recruitment of student athletes since it underscores the seriousness of our commitment to academic support program. It also gives the student athletes confidence that their particular instructional needs will be met by our academic support program.
- The IRT exams will be useful for helping the student athlete prepare for later pre-professional exams in teaching, law, business.

Some of the specific concerns raised by the IRT procedure (based on discussions in San Francisco) included:

- Availability of time to assess and design an comprehensive intervention program. The schools using the quarter system were at an enormous advantage in this regard. Schools on the semester system will have to fit "proactive" academic support into a small time frame. It was suggested that the testing be completed before school begins and the proactive tutoring process begin in the fall.
- It would be nice to fit PLATO instructional cross references into the IEP's for those schools which have this capability.
- Debate pro and con over the value of language arts IRT assessment for written expression. Most agreed that it is more a question

of the personnel the athletic department has to address language problems. The information is valuable but not as valuable as the math information. Some schools, however, did find the language IRT valuable.

## I. SUMMARY

In summary, stimulating and building human capital formation of student-athletes through the formative and summative evaluation process is a major mission of academic support programs. For low achieving students athletes, the academic support program will be nearly the only source for developing the skills needed to derive benefits from their human capital investment in school. Formative evaluation is the centerpiece for enhancing human capital formation and the later human capital potential of the student athlete. Formative Evaluation skills should therefore reflect themselves as a centerpiece for a professional standard of care for academic support personnel. The purging of misinformation and the filling in of an incomplete information base of the student-athlete should be considered as fundamental to the mission of academic support. Information based formative evaluation thus has the dual objective of both assisting and partly defining a professional standard of care for academic support personnel.

Some of the notions of information referenced standards of mastery as presented in this study serve to underscore an interesting alternative to current testing practices. The IRT assessment procedures seem to be consistent with the notion of promoting "equal educational opportunity" through information equality.

In conclusion, any measure the NCAA proposes in the area of determining athletic eligibility will encounter some controversy.\* The issue then becomes which measure or combination of measures (which can include the SAT) is fair, consistent and logical for increasing the likelihood of a successful academic and college experience for the student athlete. Ideally these measures should be affirmative, diagnostic, and proactive in the sense of empowering the student athlete (and the athletic department) with specific recommendations and prescriptive information.

The goal of an education, not a diploma, for the student athlete requires a reexamination of academic support procedures which involve not

\* For example, the self interest of the community colleges, traditionally an institution where most proposition 48 type students would participate in sports, would tend to favor retention of NCAA propositions such as 48 and 42.

They have excellent instructional programs and feel they can better help the student athlete. From the student athlete perspective, however, they would want to participate in highly visible sports programs and from an "economic" perspective (at least in sports) they would probably be better off at the four year institution.

only the interest of the student athlete but the academic faculty and the general community (or society) after graduation. The separate practical and philosophical goals of the college faculty, the athletic department and the student athlete, though difficult to obtain, are not mutually exclusive to each other.

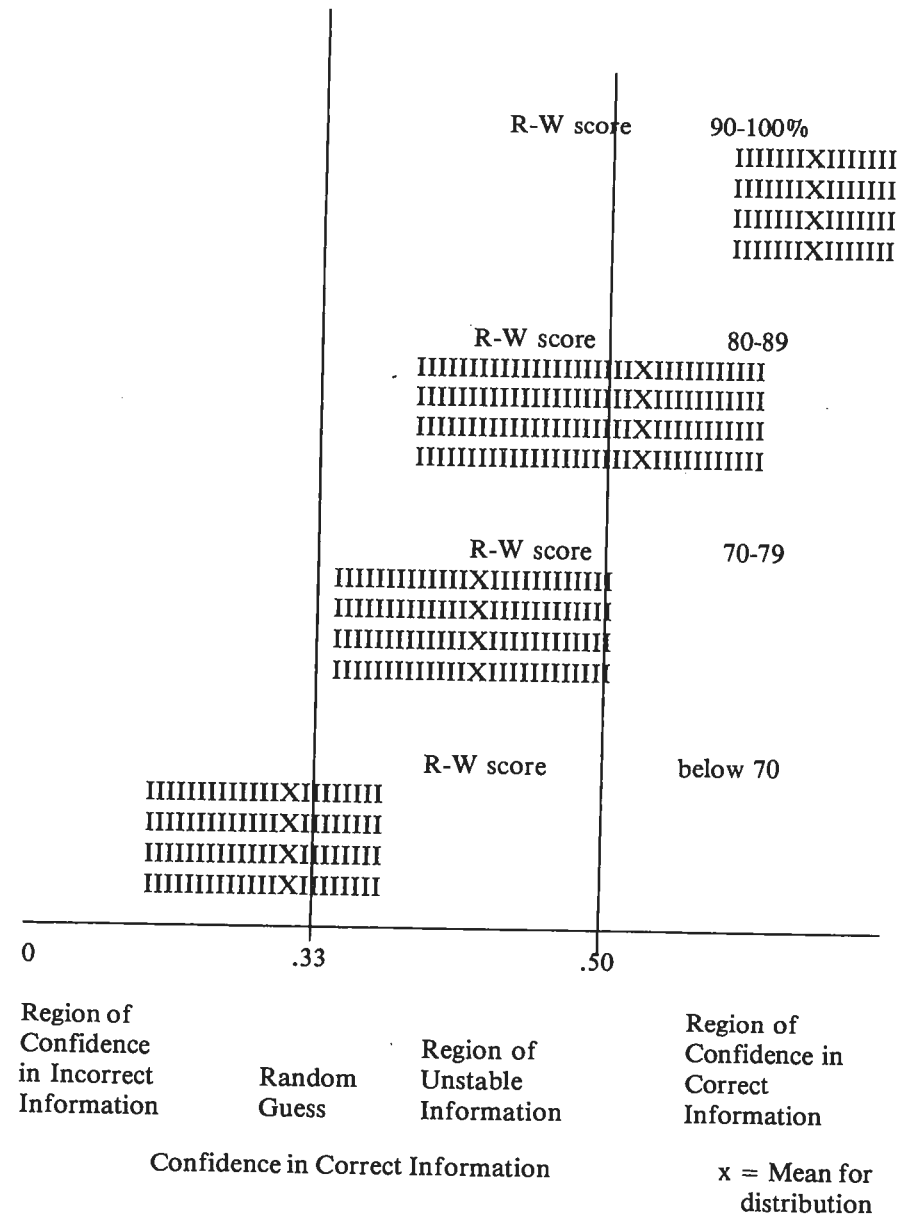
Finally, a professional standard of care for academic support personnel can be considered as part of the bridge needed to achieve educational, societal as well as athletic objectives. More importantly perhaps, continued research efforts in this area will tend to underscore the commitment of the NCAA and N4A to promoting "equal educational opportunity" along with quality athletic programs while not compromising on academic quality. The seemingly impossible task of simultaneously achieving all three objectives (academic quality, athletic quality, and equal opportunity), will require the utmost of our research and professional efforts. Information Referenced Testing for academic support of the student athletes is hopefully one important step in this direction.

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### Figure 1

Range of Confidence in Correct Information Given  
Ranges in Percent Correct Score for Student Athletes Taking  
the Exam using Both R-W and MCW-APM Test Scoring Formats

Test item	Infor. state	Description Instructional Cross Referenced
5	M	Mixed number multiplication B. M. Schaums, Ch. 3, p. 29-49
11	M	Units of measurement-kilograms B. M. Schaums, Ch. 6, p. 9, 20, also 125-128
.	.	.
.	.	.
31	M	Linear equations (slope) B. M. Schaums, Ch. 7, p. 93-110

Examinee uninformed (lacks information) responses—concepts that you didn't know. Have your instructor explain these concepts to you.

Test item	Infor. state	Description Instructional Cross Referenced
23	U	Exponential equations B. M. Schaums, Ch. 8, p. 110-145
24	U	Log equations B. M. Schaums, Ch. 9, p. 146-176
.	.	.
35	U	Word prob.—ratio and proportion B. M. Schaums, Ch. 6, p. 82-92
.	.	.

Examinee partially informed items on examination—concepts where you weren't sure of the answer. Have your instructor review these concepts with you.

Test item	Infor. state	Description Instructional Cross Referenced
18	P	Word prob.—multiplication B. M. Schaums, Ch. 1, p. 1-9
.	.	.
.	.	.
.	.	.
30	P	Linear equations (slope) B. M. Schaums, Ch. 7, p. 93-110

Figure 2

Typical Student Athlete Individual Education Plan (IEP)  
(M = Misinformed U = Uninformed P = Part Informed I = Informed)

Misinformed examination items for your examinees. Your examinees have wrong information in these concept areas—misinformation.

Have workshop coordinator develop instructional materials and demonstrate misconceptions. Follow this with accurate information.

Item	Number	Percent	Concept Description/ Cross Reference
27	15.00	0.45	Calculations with scientific notation B. M. Schaums, Ch. 2, p. 9-29
20	12.00	0.36	Word problem—rate-time-distance B. M. Schaums, Ch. 4, p. 43-51
31	11.00	0.33	Linear equations (slope) B. M. Schaums, Ch. 7, p. 93-110
.	.	.	.
.	.	.	.

Uninformed test items on the examination—examinees generally lack information in these concept areas. Basic instruction is needed. Have workshop coordinator prepare instructional materials to teach these basic concepts.

Item	Number	Percent	Concept Description/ Cross Reference
25	15.00	.045	Plane geometry B. M. Schaums, Ch. 11, p. 198-228
23	14.00	.042	Exponential equations B. M. Schaums, Ch. 8, p. 110-145
35	7.00	0.21	Word prob.—ratio and proportion B. M. Schaums, Ch. 6, p. 82-92
.	.	.	.
.	.	.	.

Partially informed concept areas—your examinees have incomplete or unstable information in these concept areas. Thorough review is needed in these areas.

etc.

Figure 3

Athletic Department Information Profile:  
Clustered IEP's of Student Athletes

(Alpha- betical listing)	%MCW	%Info. Use	%Uninf.	%Confid.	Class Assessment	Exam
Student A	0.97	0.97	0.0	0.91	Fully Inf., Adv. to next L,	1
	0.98	1.00	0.0	0.96	Fully Inf., Adv. to next L,	2
	0.96	0.97	0.02	0.88	Fully Inf., Adv. to next L,	3
	0.86	0.86	0.0	0.54	Part. Inf., Review & instr.,	4
Student B	0.80	0.81	0.16	0.39	Part. Inf., Review & instr.,	1
	0.75	0.60	0.60	0.29	Uninf., Instruction needed,	2
	0.97	0.97	0.0	0.91	Fully Inf., Adv. to next K,	3
	0.80	0.80	0.0	0.37	Part. Inf., Review & instr.,	4
Student C	0.80	0.79	0.22	0.39	Part. Inf., Review & instr.,	1
	0.65	0.25	0.33	0.24	Part. Mis., Some reeducation,	2
	0.86	0.86	0.02	0.54	Part. Inf., Review & instr.,	3
	0.81	0.76	0.13	0.39	Part. Inf., Review & instr.,	4
Student D	0.75	0.75	0.11	0.29	Uninf., Instruction needed,	1
	0.74	0.57	0.51	0.28	Uninf., Instruction needed,	2
	0.79	0.79	0.02	0.37	Part. Inf., Review & instr.,	3
	0.80	0.80	0.0	0.38	Part. Inf., Review & instr.,	4
.	.	.	.	.	.	.
.	.	.	.	.	.	.

Figure 4

Academic Advisor Analysis Clustered Summative Evaluation  
for Use in Matriculation, Counseling and Advisement

%MCW = Information Referenced Score (0 to 1.00) where 1.00 = 100% correct and 100% confidence in the correct information

%Info = Percent time a student athlete is correct when 100% sure of an answer

%Uninf = Percent "I don't know" responses

%Confi = Average confidence in "correct information" on the exam

Class

Assessment = Information Referenced Standard of Mastery

Exam

Number = 1 = Math 2 = 2 3 = Language 1 4 = Language 2