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ABSTRACT

Past researchers of education candidates have remarked that educational administration (EA) has attracted students of below-average verbal, quantitative, and analytic scores as measured by standardized tests. This is a two-fold problem: (1) Principals with high overall academic ability are more likely to be viewed as leaders in re-intellectualizing instruction with teachers so that they achieve academic success with nearly all students; and (2) principals should be highly analytic about their work in storing and retrieving information in ways that result in high-quality decision making and problem solving. In this study, researchers examined the Graduate Record Examination of examinees intending to enter EA graduate programs from 1982-96. Two key findings were that examinees planning graduate work in the field of education have lower verbal, quantitative, and analytic scores than those of examinees in the other 7 fields, and within the field of education, the verbal scores of examinees intending to study administration are 11 points lower than the mean for the entire field of education. Suggestions for improving the problem and recommendations for future research are provided. (Contains 30 references.) (DFR)

# A Crisis in the Principalship?: The Intellectual Firepower Needed for 21st Century Schooling vs. Candidate GRE Scores

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Abstract

Past reviewers of education candidates (Achilles, 1984; Griffiths, Stout, & Forsyth, 1987) have remarked that education administration has attracted students of below-average verbal, quantitative, and analytic scores, as measured by standardized tests. This is a major problem for administration programs for two reasons. Principals with high overall academic ability are more likely to be viewed as leaders in re-intellectualizing instruction with teachers so that we achieve academic success with nearly all of our students. Second, principals should be highly analytic about their work in storing and retrieving information in ways that result in high quality decision making and problem solving. In this study researchers examined the Graduate Record Examination of Examinees intending to enter EA graduate programs from 1982 to 1996. Two key findings were: (a) Examinees planning graduate work in the field of education have lower verbal, quantitative, and analytic scores than those of examinees in the other seven fields (e.g., arts and humanities, physical sciences); (b) Within the field of education, the verbal scores of examinees intending to study administration are 11 points lower than the mean for the entire field of education. Suggestions for improving the problem and recommendations for future research are provided.

# A Crisis in the Principalship?: The Intellectual Firepower Needed for 21st Century Schooling vs. Candidate GRE Scores

Will future principals have the intellectual firepower to deal with the new millennium challenges? This question grounds this paper and relates to the conference theme: 21st century challenges to education administration (EA). Public education must have bright, competent principals to deal with change, ambiguity, and diversity) characterizing all 21st century organizations.

This issue is timely because national concern about public school leadership led in part to the historic meeting on February 25, 2000 of the "big ten" professional associations having interests in educational administration (EA) standards, accreditation, assessment, and certification of school leaders for the coming decade. Perhaps hidden in this "political thicket" through which NCPEA and other associations must navigate (Martin, 2000) is the underlying issue of principal candidate intellectual quality. The hypothesis grounding this paper is that if we do not attract bright candidates in the first place, other policy issues (e.g., national standards and NCATE certification) may be mute.

Keedy and Grandy (1999) examined the Graduate Record Examination computer files from 1982 to 1996 of examinees intending to study school administration. That education major scores were the lowest of the eight fields (e.g., physical sciences, humanities) was not reassuring. What troubled the researchers more, however, was that EA examinees scored the lowest of the education subfields (e.g., elementary education). We fall

far short are of attaining Griffiths et al.'s standard for recruitment.

In this paper we explore ways to address low intellectual quality in principal candidates. After briefly reporting the study findings, session leaders will elicit participant reaction to two strategies for recruiting quality candidates: reducing self-selection and making teaching a more attractive career to end the "brain drain" in the teacher corps (which forms the "pool" for most principal candidates). The session then shifts to a collaborative format in identifying strategies in candidate recruitment from the audience. Participants will receive handouts describing the problem, the study, and potential solutions.

Like many smoldering issues within the EA field, this issue is hardly new. Griffiths, Stout, & Forsyth (1987) reported that during the years 1981-1984 EA majors ranked fourth from the bottom of 94 intended majors.[1] Griffiths et al. (1988) recommended that only those candidates with scores in the upper 50th percentile of all examinees be accepted into EA programs. We therefore concur with the 1987 Griffiths et al. assessment of the low GRE scores of principal candidates: "Lest some think too much emphasis is placed on the intellectual criterion for educational administrators, they should be reminded that there are no recorded examples of good dumb principals or successful stupid administrators" (p. 290).

## Why Use Graduate Record Examinations as an Entrance Criterion?

Why are GRE scores important? We provide three reasons.

The GRE Sample Size

GRE examinees constitute a national sample of prospective school principals and are probably the largest and most representative sample available as a basis to judge the intellectual prowess of EA candidates. We do admit, however, to three limitations to use of GRE scores. First, it was limited to all US citizens who took the GRE and specified that they planned to study education administration (EA). Second, some principal candidates do not take the GRE, so they were not included in this analysis. Third, not all GRE examinees complete the course of study. (Also, some EA candidates for various reasons do not become school principals.) Last, the data studied here can be generalized only to GRE test takers who intended to enroll in graduate school and study EA.

Principals as Academic Leaders

Reformers now expect schools to succeed with nearly all students. In the mid 1980s school policy took an abrupt turn when decision making began to devolve to the school level. In exchange for this autonomy principals and teachers were to be held accountable for student outcomes (Alexander, 1986). This policy exchange places immense pressure on schools to re-think how curriculum is taught and instruction delivered (Keedy, 1994). We now are expecting school personnel to make their own decisions about vastly improving their instructional capacity on a school-by-school basis. (See Spillane & Thompson, 1997.[2])

What can principals as school leaders do about improving school capacity? One way is for principals and teachers to change how they relate on an informal basis (see Keedy & Finch, 1994). An

example of this new collegial relationship can be found in the Coalition of Essential Schools literature.[3] Researchers, such as Cushman (1992), Muncey and McQuillan (1993), and Prestine (1991) found that principals and teachers in the Essential Schools related in ways different from the hierarchical, depersonalized ways that have long typified public schools. Since teachers have always operated in a highly politicized environment,[4] most teachers, according to Cushman, will not make the first moves toward learner-centered instruction until they see principals modeling comparable changes with themselves. Essential School principals define how they envision revitalizing classrooms and form these visions around exploiting opportunities offered by their school contexts (see Keedy, 1992). They persist in asking teachers to analyze and reflect on how and why they teach in certain ways: What assumptions about teaching and learning drive traditional frontal teaching as opposed to the assumptions empowering students as independent learners? (For several of these assumptions, see Keedy & Achilles [1997].)

A crucial question becomes: Can or would principals with low GRE scores relate collegially in "re-intellectualizing teaching" if they themselves are not viewed as academic leaders by teachers? Principals with low academic abilities may have little professional credibility in interacting as critical friends as many Essential School principals do with teachers. If we want the United States to be Number One in the world in mathematics and science (a national goal established at the Charlottesville summit), do we want principals with low scores that measure aptitude for graduate school work running our schools?

An Assumed correlation Between GRE Scores and Cognitive Abilities

Administrators in general are confronted with problems and making decisions (Simon, 1957). School administrators in particular work in a fast-paced, fragmented, and unpredictable environment (Peterson, 1977-78). An administrator's cognitive ability therefore is operationalized through storing and retrieving previously-stored information and making decisions based on these explanatory frameworks.

Advances in cognitive science provide the basis for our second assertion. Researchers found that domain experts perceived large, integrated patterns in problem situations quickly and represented these situations in terms of solution structures rather than as surface features (Glaser, 1991). Experts represent problems by categories and direct their problem solving by eliciting knowledge structures, or schema, which include potential solution paths (Chase & Simon, 1973; Chi, Feltovich, & Glaser, 1981). Expert problem solvers also use more abstract categories with reference to principles and have better and faster pattern recognition skills (Bereiter & Scardamalia, 1986).

Other researchers have applied the findings of cognitive science to the practice of education administration. Leithwood and Stager (1989, pp. 141-146) compared expert with non-expert principals in their problem-solving abilities. Particularly in dealing with unstructured problems, they found that:

(1) Expert principals recognized various problems from past experience and therefore solutions were familiar;

(2) Expert problem solvers were explicit about their assumptions regarding the hypothetical nature of problems presented to them;

(3) In their thinking about goal-setting, experts could frame off implications for problems not directly concerned with students and programs more than non-experts;

(4) Experts applied more principles (long-term goals grounded in fundamental laws, doctrines, assumptions) than non-experts. Regarding his entry as a principal, one expert suggested: "If the kids are turned off, they will start to look for things to criticize." Using this abstraction in providing an over-arching structure for problem solving, he then decided what issues and events should get his attention.

(5) Experts spent more time framing the problem, collecting information, and planning for the solution.

In sum, successful principals should be highly analytic about their work. Principals need to learn from experience, to organize information into explanatory frameworks, and to draw upon these frameworks in problem solving; these skills approximate inductive reasoning (linking similar particulars into categories and patterns). Drawing upon categories to deal with problems and connecting them to school goals operationalize deductive reasoning.

The cognitive requirements of domain experts, problem-solvers, and expert principals seem to relate to the cognitive skills measured by the GRE[5]:

> The verbal measure tests the ability to analyze and evaluate written material and synthesize information obtained from it,

analyze relationships among component parts of sentences, and recognize relationships between words and concepts. The quantitative measure tests mathematical skills and understanding of elementary mathematical concepts, as well as the ability to reason quantitatively and to solve problems in a quantitative setting. The analytical measure tests the ability to understand structured sets of relationships, deduce new information from sets of relationships, analyze and evaluate arguments, identify central issues and hypotheses, draw sound inferences, and identify causal explanations. (The Graduate Record Examination Board, 1996, p. 7)

GRE Scores of EA Candidates (1982-1996)

The 15 years from 1982-1996 constitute a critical time frame, since the year 1983 marked the beginning of the current reform cycle. If the GRE has remained low through 1996, then we continue to have a major problem with candidate quality. On the other hand, if GRE scores indicate substantial improvement, we can be cautiously optimistic about the viability of university-based EA programs.

In 1996 the GRE was taken by nearly 300,000 U.S. citizens. Almost 40,000 planned graduate work in education, and about 5,000 planned to specialize in EA. Examinees provided additional information about themselves, including undergraduate major, gender, age, and parents' education.

The analyses relevant to this paper's theme are below:

(1) Number of GRE test takers intending to study EA

The number of US citizens taking the GRE and planning graduate study in EA rose 35% over the 15-year period, from just under 4,000 in 1982 to just over 5,000 in 1996. However, the growth rate of all examinees during that period was 68%, so part of the increase in EA can be attributed to the greater number of people taking the GRE and planning to attend graduate school. As a percentage of all test takers, candidates in EA actually declined from 2.3% to 1.8%. The percentage of EA examinees who were female increased from 50% in 1982 to 60% in 1996. Since 1988 there has been a gradual decrease in the number of males, and the number of females has continued to increase.

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Insert Figure 1 about here

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(2) GRE scores of examinees in EA compared with the scores in other fields of study in 1996

The mean GRE verbal score of all US citizens taking the GRE was 485. The standard deviation was 96. Examinees planning graduate work in all areas of education averaged 448, and the average score in EA was 437, which was half a standard deviation below the average for all test takers. (See Table 1.)

Insert Table 1 about here

Table 1 compares EA with the eight major fields identified by ETS. Also shown are the differences (Dif-V, Dif-Q, and Dif-A) between the average scores of examinees in EA and examinees in each of the other areas. It is evident from the table that the average verbal score of examinees in EA is more than a full standard deviation lower than the average score of examinees in arts and humanities. Average scores in business and in health sciences and services are 20 points (one-fifth of a standard deviation) higher than in EA.

Examinees in engineering and physical sciences, not surprisingly, have higher quantitative skills than examinees in EA. The differences, however, are quite large: nearly 2 standard deviations (210 points) for engineering students, 1 and a half standard deviations (186 points) for examinees in physical sciences, and nearly a full standard deviation (112 points) for examinees in biological sciences. Even test takers in arts and humanities score half a standard deviation (59 points) higher in quantitative skills than do examinees in EA.

The reader might notice that test takers planning to major in EA were 11 points lower than the field of education in general.

The small difference in verbal score average between examinees in EA compared with those in all areas of education grew

slowly after 1986 (see Figure 2). Since 1989 there has been a decline in verbal score averages, and scores in EA have paralleled that decline. Patterns in quantitative and analytical scores have been similar. In Figure 2 we graph the relationship among EA test-takers, test-takers in the entire field of education, and test-takers in all fields combined.

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Insert Figure 2 about here

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(3) Test Scores in General As Related to Age

In the population as a whole, verbal scores remained the same or rise slightly with age, and quantitative scores declined. We assume this is a practice effect dependent largely on the kind of employment the older person has had prior to taking the GRE. Most college graduates work in areas that stimulate verbal skills, and, unless they are scientists or engineers, they have fewer mathematically challenging activities in their lives.

The average verbal score of test takers in EA is higher for test takers in their forties. Quantitative and analytical score averages decline rather sharply, especially after age 50, just as they do in the general population. The decline in quantitative scores for females in EA is quite large--nearly 1.5 standard deviations.

On average, examinees in EA tended to be somewhat older than examinees in other fields, with the exception of those in health

sciences and services. There are no age ranges, however, in which the average scores of test takers in EA are as high as the average scores for all examinees. Therefore, the age of EA majors does not explain their lower-than-average test scores.

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Insert Figure 3 about here

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## Discussion and Recommendations

These findings might not make EA professors comfortable with the analytic potential of principal candidates who took the GREs. As pointed out by Seeley as far back as 1981, schools now are expected to succeed with far more students than merely the top 20 percent. Yet do our EA programs have principal candidates with the potential to reframe their thinking in action (Argyris & Schon, 1974; Silver, 1982) in ways that schools can become learning communities (Senge, 1991) and high-productivity organizations (Finn, 1990)?

Despite the recommendation by Griffiths et al. (1987, p. 292) that we accept only those candidates with GRE scores in the upper 50 percentile of all examinees, we are not even close to this standard. This problem of low standardized test scores, however, has been around for a long time. Teachers, who form the "pool" from which school administrators are selected, have exhibited a similar level of academic ability across several measures at least since the 1980s. In 1982 high school seniors planning to teach ranked 26th in the Scholastic Aptitude Tests out of 29 rankings.

Their SAT average of 813 (a combined score of verbal and mathematics) was below the national average of 839. Physical science majors had the highest average (1054) while trade and vocational students (739) were last (Achilles [1984] citing U.S. News and World Report, 14 March 1983, pp. 37-40).

What should as professors of EA do about this problem? Perhaps we can argue the problem away on the basis that GRE scores may not be predictive of administrative proficiency. But what can we put in its place? There might be other measures of administrator analytic abilities and their potential for administrative quality other than the GRE. Paula Silver's work included measures of assessing principal capacity for information processing and conceptual abilities in 1975. If the GRE and the Miller Analogy Test are considered too academic to have measurement potential for administrative potential, then can we use more direct measures of analytic abilities?

Second, we can reduce the "sieve" of candidate self-selection, whereby teachers decide they want to become principals and enter masters and certification programs. The University of Louisville and Jefferson County Public Schools (Kentucky) have partnered a program (Identifying and Developing Educational Administration Leaders for Schools) in which a major assessment criterion is a recommendation by a candidate's principal. The principal also must agree to participate in mentoring activities with the recommended candidate, so it is in the principal's self-interest to recommend only a quality candidate. While not a "silver bullet," this procedure does have some effect on stopping up the sieve of candidate self-selection.

Third, policymakers need to make teaching a more attractive career. Without major career inducements, the pool from which most principals are selected will continue to be second-rate. A policy alternative is recruiting principal candidates with higher analytic skills from other fields, such as business and the military. Another recruitment strategy is luring liberal arts majors who tend to have higher GRE scores into teaching and administration. The Holmes Group now recommends that teachers first obtain an undergraduate degree in an academic field before entering a masters degree in teaching. Is there potential here for recruiting potential candidates from teachers in this five-year masters program? Teach for America also recruits liberal arts majors to the teaching career. Are there candidates available from this source?

Last, if one accepts our premise that analytic skills measured by the GRE are important to administration (and perhaps to teaching as well), EA programs should be housed in Carnegie I and II research universities which tend to attract students with higher GRE scores. Major state universities with high academic standards, however, may no longer have as many students intending to prepare for teaching (Sykes, cited by Achilles, 1984). Other institutions with open admissions policies may attract teachers of lower abilities who lack other options.

Is there a trend to eliminate EA programs from research universities? In one state's recent downsizing of EA programs, the university system's general administration eliminated a EA program at one of the state's two major research universities (see Keedy & Heuts, 1997). Does this phenomenon bode well for university-based EA programs? To exert some political pressure on higher education

state systems, each state should have an active EA professors organization capable of monitoring potential program downsizing and influencing reform-minded legislators.

As EA professors, we need to do something and not just sit on our hands. We may be traveling on a dangerous road. That the GRE for examinees planning graduate work in EA has not improved since 1984 relative to that in other fields does not bode well in a reform era in which bold and innovative approaches to education and social problems are needed. Despite warnings from Griffiths in 1987 about our crisis, we are still not attracting candidates with higher analytic abilities, as least as measured by the GRE.

## Endnotes

[1]The source is The Guide to the Use of the Graduate Record Examination Program (1985), Educational Testing Service, Princeton, NJ, pp. 22-26.

[2]According to Spillane and Thompson (1997), teachers need to learn not only more subject matter and skills. They also must unlearn much of what they already know (e.g., assumptions about the classroom conditions for maximizing student learning). This "reconstructed learning" requires sustained, honest, substantive interaction about new ideas with people who understand these new ideas for effective instruction at least a little better than most teachers. (Also see David [1994, p. 4] for this concept of capacity building.)

[3]The Coalition of Essential Schools has particular relevancy to our argument because some of their urban and inner-city schools attain higher-than-expected student outcomes. New York City's Central Park East Secondary School typically sends 95 percent of its students to postsecondary education (see Meier, 1997).

[4]For a thorough analysis of the tenuous political survival of US teachers, especially in small towns and rural areas, read Zeigler (1967).

[5]Griffiths et al. (1987, p. 290) imply agreement with our assumption about the broad connection between the GRE and principal on-the-job performance: "The Graduate Record Examination is the single best indicator of the mental ability of graduate students."

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