

Certification Panel Discussion

The following papers deal with the pros and cons of certification of SAS programmers. The panel was organized by Elliot Cramer, University of North Carolina. Other panelists include:

- ☐ David Peterson, PRI Associates
- ☐ Jack Callisher, Trilogy Consulting Corporation
- ☐ Bob Virgile, Robert Virgile Associates

A copy of the SAS Certification Opinion Poll appears on page 388.

The SESUG Executive Committee is including these materials to promote discussion of a timely (and controversial) topic. Their presence does not indicate endorsement of any position, testing technique, or certification organization.

The Case for Certification

Jack Callisher, Trilogy Consulting Corporation

Certifying SAS programmers is a must. In a consulting situation in order to best match the needs of a client with the best qualified consultant, you have to have a way to validate an individuals background and experience. These same considerations also apply in a hiring situation when employers are seeking to permanent SAS programmers. Over the years I have used a number of different tools including SAS technical questionnaires, collections of sample code, and technical interviews to determine a consultant's level of expertise. A combination of these tools has helped me succeed in placing the right consultants with the right clients. I propose that a certification procedure be based on these same tools and thereby insure the same success I've experienced.

Evaluation and Certification of SAS programmers: A Panel Discussion

Moderator: Elliot M. Cramer, University of North Carolina

The evaluation, licensing, and certification of SAS programmers is a topic that has been of some interest to the SAS community. There have been 11 communications regarding credentialing and education in the SAS-L forum since May 1993, and a number of papers at SUGI have dealt with education and evaluation. A recent article in DATA-MATION ("How To Certify That Training Works," September 1, 1993) dealing with the more general issue of certification has argued that formal or informal certification is inevitable. This panel discussion that will explore the issues involved in the evaluation and certification of SAS programmers.

How the American Statistical Association has Dealt with Certification Issues

David W. Peterson, PRI Associates, Durham, NC

ABSTRACT

This article recounts some of the initiatives undertaken by the American Statistical Association to decide whether it should offer certification to statisticians, and describes some of the features of the certification system under discussion. It also describes some of the arguments for and against certification that have been raised. It is suggested that this information may be helpful in addressing the issue of whether certification for SAS programmers is desirable.

INTRODUCTION

The debate on the certification of SAS® programmers has a close contemporary parallel within the American Statistical Association (ASA), where discussions about the certification of statisticians have been underway for at least twenty years, and especially widespread and lively during this past year. As one weighs the advantages and drawbacks to SAS programmer certification, it seems worthwhile to recount some of the steps taken by the ASA to foster discussion of the issue, and to note some of the points raised thus far.

SETTING UP THE DISCUSSION

The ASA established a Committee on the Certification of Statisticians to encourage discussion of the matter, to suggest ways in which certification might be implemented, and to identify both its desirable and undesirable aspects. The committee, chaired by Dr. Robert Parker of Vanderbilt University, set up an e-mail bulletin board through which ASA members and others could exchange their views on the topic, and used both regular meetings of the ASA and its affiliates as well as their publications to solicit further views and to apprise the public of the committee's activities and progress. One especially informative issue of the *Amstat News* (November 1993) carried a pair of articles, one arguing convincingly for certification, the other raising strong arguments against. (The latter article supplied e-mail addresses to which one could send votes against certification — not quite a 900 phone number, but the same idea.) An earlier

article (June 1993) in the same journal supplied a Certification Interest Form, which a reader could fill out and mail to the committee to register his or her interest in becoming certified. As part of its feasibility studies, the committee met with several potential examination contractors, who recommended that an attempt be made to analyze the jobs of statisticians, to identify those skills necessary to be a successful statistical practitioner.

The current committee has now completed its work, and has submitted a proposal for certification, some of the details of which are discussed below. This proposal was published in draft form in the July 1993 *Amstat News*, and supplemented thereafter in response to comments the committee received. The proposal now rests with the ASA Board of Directors, which recently undertook a broad mail survey of its membership to determine general attitudes toward certification and the approximate number of people who will seek it. It is likely that a new committee on certification will be appointed to carry on from here.

ELEMENTS OF THE ASA'S PROPOSED CERTIFICATION PROCESS

The Board of Directors of the ASA resolved last December that "various sub-disciplines of statistics have different needs" and that "[t]o fulfill one such need the ASA should continue to work toward providing, as a service to qualified individuals who so request, certification attesting to their competence in statistics." Thus a key feature of the process being contemplated is that it not be mandatory, and that statisticians who have other ways of establishing credibility need not pursue certification. Certification therefore is quite distinct from licensure.

Other key features of the certification process proposed are (i) it will use both an examination (to assess knowledge) and a portfolio (to assess experience); (ii) during its phase-in period, it will not require statisticians with sufficiently strong portfolios to take the examination in order to become certified; and (iii) certification will lapse after a fixed period, but can be renewed based on a current portfolio.

Certification by portfolio would require submission of (i) a resume showing evidence of knowledge of statistics, (ii) evidence of active statistical practice for at least the most recent five years, (iii) a three-page type-written statement from the applicant describing areas of significant recent professional experience, and (iv) the identities of three references familiar with the applicant's work. The fee for certification would be about \$200, and the duration of the certification would be about five years.

KEY POINTS IN THE DISCUSSION

As might be expected, some statisticians strongly favor certification, while others strongly oppose. Some of the more cogent arguments on each side are described below.

What is the Point?

The purposes of certification are several. At the grass roots level, certification is a badge of accomplishment for the individual and an indication to a potential employer that this person has certain job-relevant skills. This has obvious benefits in helping insure that jobs needing statisticians are filled by people competent to do the work. Statistics is a broad ranging field, and unlike some disciplines such as law or medicine, many of its most able practitioners do not have college degrees in the discipline itself. Thus, while the MD or JD degree almost always separates the physician or lawyer from the non-physician or non-lawyer, the professional economist, sociologist, engineer or psychologist may be as or more competent at certain statistical applications than is another person holding a degree in statistics. Certification is a way that such practitioners can identify themselves to the public as qualified statisticians.

On a grander scale, by helping distinguish persons who have good practical statistical knowledge from those who do not, certification should cause the quality of statistical work to improve, thus making society better off, and, perhaps as a byproduct, improving the public's perception of the profession. Now more than ever before, it is easy for the novice to do complicated statistical calculations without fully understanding their implications, a circumstance that can lead to serious errors in research, manufacturing, public policy, public safety and justice. Certification may help reduce the incidence of such errors by making it less likely that employers will entrust such work to people incompetent

in statistics. Indeed, by instituting a certification process, the profession will signal to both its members and the general public its concern for ethical behavior and technical competence, an effect that should improve both the practice of statistics and its perception by the public.

Why Won't it Work?

Certification will require the establishment of an expensive and unnecessary bureaucracy, which ultimately will become the gatekeeper to the profession. Statisticians will feel pressured to become certified, and certification, though not mandatory at first, will become the defacto standard for the profession. This is especially undesirable in a field such as statistics, which is so extremely diverse that no certification test can reasonably cover all of the facets most important to at least some specialties, nor, even if this were possible, could any statistician reasonably be expected to have knowledge so broad. Furthermore the process would tend to cause training programs in statistics to focus only on that codified body of knowledge necessary to gain certification, thus stultifying the educational process and depriving society of the most creative statisticians to come.

Any practical certification test will be so elementary that it will not screen out people incapable of handling the kinds of complex problems one faces outside the classroom. Thus, certification runs the risk of endorsing people who cannot do good statistical work, and the employer who relies on the certification credential will be sorely disappointed. Indeed, it is the weakest members of the profession who have the most to gain by certification; the strong do not need it, for their abilities are or soon will be known.

Furthermore, the practice of statistics is so widespread that any attempt at this point to regulate it will be in vain. Certification is a step toward forming a guild, but unlike other guilds, the tenets of the statistical profession are now so widely known and ingrained in other professions that any attempt by statisticians to reclaim those tenets and place their application solely in the hands of persons anointed by the certification process will be met with disinterested shrugs from others who use them daily and well.

The best way to improve the practice of statistics is to do good work, not to devise artificial seals of approval. Good work is the result of good training, both of statisticians and of people who employ statisticians. It

is along these lines that the energies of the ASA should be directed, rather than to the establishment of a new bureaucracy.

CONCLUSION: SOME THOUGHTS REGARDING SAS CERTIFICATION

Many of the points made above regarding the certification of statisticians can be paraphrased to apply more or less directly to the certification of SAS programmers. If certification is to be given thorough and dispassionate discussion, that discussion needs to be organized and mediated by a committee from a professional association such as SUGI, to make sure that all sides are fairly heard, and that a position on the issue is fashioned that has the support of a substantial portion of the community of SAS programmers. If the certification debate within the statistical community is any guide, there will be strong arguments put forth by strong voices on each side of the issue.

One important difference between statisticians and SAS programmers is that the former already have a type of certification in the college degree system, whereas no institution of which I am aware offers a degree in SAS programming. This may be one of the more compelling arguments in favor of SAS certification.

REFERENCES

Most of the information for this article was compiled from articles and notices in the *Amstat News*, the monthly newsletter published by the American Statistical Association. The issues used were those for April 1993 through February 1994. For an especially thoughtful presentation of the case in favor of a limited program for certification of statisticians, see Imrey, Peter B. (1994), "Statistical Values, Quality and Certification," *The American Statistician*, 48, 65-70. It is followed by numerous assenting and dissenting comments, as well as the author's reply.

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Obstacles to SAS® Programmer Certification

Robert Virgile, Woburn MA

Obstacle #1: A Lot of Technical Work

Creating test questions is more difficult than you would think.

Questions must be changed at least annually.

New, comparable programming tests are more difficult to create than new math or English test.

In math, change a coefficient and you have a new quadratic equation. The level of difficulty remains the same. English can supply a virtually unlimited number of "that" vs. "which" questions.

Creating short, advanced level problems is ridiculously difficult. I've been doing it at the rate of 20 problems per year. Even at that rate, top-level programmers solve 80% to 90% of the problems.

Obstacle #2: A lot of Administrative Work

Type, print and distribute copies to many sites, while keeping questions secret.

Administer test.

Grade test.

Distribute scores.

Keep records.

Obstacle #3: A Fair Grading Method

It is very difficult to standardize test difficulty so that an 85% score means the same thing from year to year.

A pass/fail approach might automatically flunk one third of the test-takers regardless of their score.

However, this method makes it more difficult to pass during the first couple of years of testing.

Can answers receive partial credit?

Obstacle #4: Diversity of the Software

Do you test on basics only, or do you consider macro language, SAS/GRAPH®, SAS/FSP®, SAS/STAT®, SAS/AF®, SAS/ACCESS® and more.

Many job openings and career paths require some of these other technical skills. An excellent programmer might know very little about statistics.

Obstacle #5: Will Certification Accomplish Anything?

Will employers make better hiring decisions?

What about other success factors such as

communication skills, desire, individual vs. corporate personality? We're assuming that in the hiring process, technical skills are difficult to evaluate but other skills are not. Is this possible?

If companies evaluate candidates poorly, will certification fix the problem or will it provide a false sense of security?

Many companies use other programming languages. If a company can evaluate a candidate's COBOL skills, it can probably evaluate SAS skills as well. And if the company can't evaluate COBOL skills, will SAS certification matter?

Will programmers learn by studying for the test? Of course they will. That's a major benefit. But some of what they learn will be test-taking skills, and some will be technical skills not needed on the current job. Would the time be better spent solving real life programming problems?

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