

## Why We Need a Structured Abstract in Education Research

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*Background:* Approximately 1,100 education journals collectively publish more than 20,000 education research articles each year. Under current practice, no systematic way exists to move the research findings from these studies into the hands of the millions of education practitioners and policymakers in the United States who might use them.

*Purpose:* To help disseminate education research findings, we propose that education journals consider adopting a *structured abstract*, a structural innovation that focuses on the format of the article itself. The structured abstract would replace the paragraph-style narrative summary—typically either an APA-style abstract or “editor’s introduction”—now present at the beginning of many articles.

*Intervention:* A structured abstract is a formal and compact summary of an article’s main features and findings. As does a table or figure, it has a predictable structure that compresses information into a small space and can be read independent of the main body of the article. The structured abstract is longer and more detailed than the standard paragraph-style narrative summary. On the printed page, the structured abstract appears between the title and the main body of the article. It includes basic items applying to all articles (i.e., background, purpose, research design, and

conclusions) and several additional items that apply to some articles but not to others (i.e., setting, population, intervention, data collection and analysis, and findings).

*Research Design:* Analytic essay.

*Conclusions:* The structured abstract is a viable and useful innovation to help practitioners and policymakers systematically access, assess, and communicate education studies and research findings. Relative to current practice, the structured abstract provides a more robust vehicle for disseminating research through traditional routes as well as through new channels made possible by emerging technologies.

Findings from educational research may be our greatest resource for supporting and improving educational practice. The latent value of educational research to practice, however, can be realized only if these research studies and findings actually reach individuals and groups who can use them. Research findings are not self-disseminating, and one cannot assume that important research studies and findings automatically make their way into the world of education practice of their own accord. How to move research findings into the field in an effective and meaningful way has long been a complex, challenging question in education.

This challenge is partly due to the sprawling nature of education research. Education research has traditionally encompassed a wide variety of researchers, agendas, institutions, subject areas, contexts, and forums for publication. The field is broad and decentralized, and the result

is a vast body of information that can prove difficult to access, sort out, or comprehend.

The challenge is also partly due to the sheer size and diversity of the education community. The United States has more than 3.6 million teachers in elementary and secondary education, more than 100,000 principals, and about 15,000 school districts, each with its own set of district administrators, school board members, and concerned citizens. The parents and family members of the 60 million students in elementary and secondary education represent another constituency, as do the policymakers and legislators in the 50 states (along with the District of Columbia) and at the federal level. Postsecondary education represents another 1 million faculty members, along with an enrollment of 15 million undergraduates and 1.8 million graduate students.

Education research often does not reach people who might use it in educational practice for many other important reasons in addition to size and sprawl. Almost any educator can attest to the large perceived gaps that separate the worlds of education research, practice, administration, and policymaking from one another. These gulfs among the different education communities tend to be deep and wide, presenting genuine barriers to the possibility of education research systematically influencing education practice, and vice-versa.

### Accessing Research Findings Reported in Education Journal Articles

However, this problem of extending the reach of research studies and findings into the realm of educational practice also has technical dimensions. The technical innovation we propose here focuses on a major component of this issue: how to help millions of people in education connect with

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the tens of thousands of articles of education research that might prove useful to them in practice. Education journals constitute one important forum for disseminating research findings because they provide stable institutional vehicles for authors to publish new and original research on a broad array of educational issues. At present, more than 1,100 education journals collectively publish more than 20,000 education research articles each year.<sup>1</sup>

Today, consumers of education research can access findings of education studies under a fairly narrow set of circumstances. These conditions include access to a hard copy of the journal article through a personal or institutional subscription or through a library, on-line access to the full text of an article through a journal's Web site or a via a database service, and receipt of a copy of the article from someone else who has access to the hard copy or digital version.

Furthermore, in addition to access, individuals must have the time and motivation to sort through the various education journals to find and evaluate articles of potential value to themselves and their colleagues. This threefold requirement of access, time, and motivation creates a formidable bottleneck on the flow of information and findings to people in education who might use those findings to inform practice or policy.

### **Current Basic Format for Journal Articles**

Education journal articles, like education research in general, address a broad, varied set of issues in education. Each education journal makes its own editorial decisions and policies, resulting in published articles that cover an astonishing variety of topics with a large assortment of research strategies. Beneath all of this variation, though, resides a familiar and predictable format for journal articles that the field of education shares with the other social sciences. This basic format always includes a title, a listing of author(s) and institutional affiliation(s), and the body of the article, often divided into sections focusing on introduction, methods, analysis, findings, and conclusions. It also almost always includes a reference section; a short, paragraph-style narrative summary; and an acknowledgments section. Individual education journals may format each element in a slightly differ-

ent manner (e.g., where the institutional affiliation is listed, the style for the references section), but this set of elements is fairly consistent across articles and across journals.

These elements each provide partial clues about the full journal article but do not—either individually or collectively—convey the detailed, specific information necessary to interpret and understand the findings and conclusions of the article. The reader can locate and extract that information only by scanning the body of the article to identify its key features, which the reader must then consider jointly when evaluating the published results. The time required to “size up” an article by finding and evaluating its salient information depends on the skill and experience of the reader and the extent to which the article itself is well organized, well written, and thorough.

Thus, the task of an individual reader who seeks out the research findings of an education research article is often not an easy one. Nevertheless, the search is much more difficult when conducted on a computer. Most online and database searches for education studies or research findings yield only the barest reference information, typically providing bibliographic details and a brief, very general overview. A critical appraisal of a study's findings is daunting—if not impossible—when specific information is not available about the study's background, purpose, setting, participants, intervention, research design, data collection and analysis, or conclusions. It comes as cold comfort to many a busy person in education that this detailed information is sitting on the shelves of local libraries in the form of microfiche or bound journals.

### **The Need for a Structured Abstract in Education Research**

The traditional way of disseminating education research is unfortunate in our opinion because so many valuable education studies and findings get lost in the shuffle. We believe that the structured abstract, an innovation that focuses on the format of the article itself, can help overcome many of these status quo impediments to disseminating education research findings. A structured abstract would systematically offer individuals greater *access* to detailed information about research findings reported in education journal articles, a better way to *assess* this information through

a format that efficiently compresses it, and a ready-made vehicle to share and *communicate* the findings with others who might use them in practice.

The structured abstract occupies, both literally and figuratively, the strategic middle ground between the title and main body of the article. The title of an article hints at what the article is about but offers so little information that it usually is an unreliable marker: Readers cannot judge an article by its title. The main body of the article, on the other hand, provides the specific details necessary for a critical appraisal of a study and its findings but requires the reader to work through pages of text to locate the crucial information.

The structured abstract, at one to two pages long, provides a formal and compact summary of an article's main features and findings. This concise summary provides a wealth of specific details about an individual article and thus serves as an information tool that allows readers to consider and sort through large pools of articles when searching for studies of potential interest. The structured abstract likewise serves as a useful vehicle for sharing and communicating education research, in that the compact format is well suited for reaching the attention of busy people. It is also a good fit with ongoing trends in emerging technology, as the structured abstract is the right size for being read in e-mail messages received via computers and portable handheld devices.

Finally, the structured abstract offers a balanced way for journals to provide detailed information about education studies and findings online while still maintaining control over access to intellectual content. With the structured abstract freely available online, people conducting computer-generated searches have access to an intermediate level of information about a study's key features and findings. This detailed information can help someone looking at a large number of articles assess the scope of research that has been conducted on a particular topic and the general direction of the findings. People conducting computer searches will also be able to use the structured abstract as an information tool to determine which articles they need to access and read as full-text documents, likely leading to a greater overall demand for journal articles of education research. Web sites of individual journals

can make these structured abstracts available; in addition, education information services that already exist, such as the federally funded Educational Resources Information Center (ERIC) system, could make the structured abstracts from hundreds of journals collectively available online.

### **The Structured Abstract in Education Research: An Example**

Figure 1 (see p. 32) presents a comparison of the actual abstract (formatted according to the guidelines of the American Psychological Association [APA]) for an original study on class size that appeared in a top-tier education research journal in 1990 and a structured abstract for the same article. Readers can see and evaluate for themselves from this example how a 389-word structured abstract compares with a 150-word narrative introduction in providing the necessary information for quickly accessing and assessing the study's main features and findings.

### **The Structured Abstract in Education Research: Basic Design**

A fundamental principle behind the structured abstract is that it is a serious part of the article itself and is edited with the same attention and rigor as the rest of the article. A structured abstract is similar to a table or figure in that it has a predictable structure, it compresses a great deal of information into a relatively small space, and it is self-sufficient insofar as it is complete and able to be read and understood independent of the main body of the article.

Education journals would be expected to have slightly different versions of the structured abstract that all convey essentially the same information, just as journals have different styles for conveying the same bibliographic information in the reference section. The structured abstract is characterized by two sets of elements: four basic elements that apply to all articles (i.e., background, purpose, research design, and conclusions) and five additional elements that apply to some articles but not others (i.e., setting, population, intervention, data collection and analysis, and findings). A template for a structured abstract that shows all nine elements is displayed in Figure 2 (see p. 33).

As a general rule of thumb, we recommend that structured abstracts be between 200 and 400 words in length. This provides sufficient space for details about key

features and findings of a study, yet the abstract would still fit on a single page.

The structured abstract is both similar to and different from the paragraph-style narrative summary found in current practice. They are similar in that the basic contents of the structured abstract are essentially the same as the elements of journal abstracts recommended by the *Publication Manual of the American Psychological Association*, the reference text that many in education research and publishing consider authoritative on matters of style (APA, 2001). The APA guidelines recommend that authors prepare a "brief, comprehensive summary of the contents of the article" that is "accurate, self-contained, concise and specific." The guidelines then suggest what should be included in an abstract for four kinds of articles: an empirical study, a review or theoretical article, a methodological article, and a case study. The elements proposed for each of these abstract types are consistent with the nine basic elements described here for a structured abstract.

APA-style abstracts and structured abstracts differ, however, in that a structured abstract would be hamstrung by a 120-word limit, whereas a paragraph-style narrative summary would not necessarily be improved by doubling or tripling its length and having a three-paragraph abstract instead of a one-paragraph summary at the beginning of an article. The APA guidelines dictate a word limit of 120 words and imply that abstracts should be in paragraph style, and in this case the strictness of the word limit seems to impose some discipline on the somewhat loose and open format of the paragraph. The structured abstract, on the other hand, allows for greater length but within a highly structured format, providing a detailed and user-friendly framework to organize and display this additional information. The result is a longer and more robust abstract wherein greater length does not compromise clarity or concision but instead allows the abstract to convey substantially more key information to the reader in a stand-alone format that can be understood independently of the main article.

### **Conclusions**

The technical innovation of the structured abstract has enormous potential to extend the reach of educational research. Education journals, naturally, will play the crucial

role in their implementation, in that individual journals will decide whether to adopt structured abstracts and in what form. To assist individual journals in this decision, we suggest that they give serious consideration to the way in which education practitioners and policymakers currently access, assess, and disseminate information about education studies and findings reported in journal articles and to how a structured abstract could help improve that process.

When a journal does decide to adopt a structured abstract on a trial or permanent basis, we recommend that the journal also consider an evaluation plan to assess the effects of the structured abstract in practice. An important limitation of the structured abstract is that its format, while designed to facilitate access to education research, could nevertheless be misused to distort, oversimplify, or overgeneralize research findings. Careful, ongoing evaluation of the design and implementation of the structured abstract in education can help in identifying these limitations in practice and in developing effective safeguards and strategies to address them. These evaluations can likewise help individual journals understand the impact of the structured abstract on their readership and inform the decision making of other education journals contemplating whether to adopt the structured abstract.

The use of the structured abstract in medicine provides a relevant example from another field of inquiry. In 1987, a call for a structured abstract in medical journals appeared in the journal *Annals of Internal Medicine*, and *Annals* adopted the structured abstract format itself 6 months later (Ad Hoc Working Group for Critical Appraisal of the Medical Literature, 1987). The number of medical journals that voluntarily adopted the structured abstract grew exponentially, and within 5 years most of the leading medical journals in the United States and throughout the world had adopted some form of a structured abstract. Within 3 years of the original call for a structured abstract, the U.S. National Library of Medicine included the full texts of structured abstracts in the federally funded MEDLINE database that is accessible and searchable by the public. Editorially, the adoption of the structured abstract has been reported as "straight-forward": "After a brief settling-in period, editorial revisions have been no more extensive than for material in the

**Original APA-style abstract:**

A large-scale experiment is described in which kindergarten students and teachers were randomly assigned to small and large classes within each participating school. Students remained in these classes for 2 years. At the end of each grade they were measured in reading and mathematics by standardized and curriculum-based tests. The results are definitive; (a) a significant benefit accrues to students in reduced-size classes in both subject areas and (b) there is evidence that minority students in particular benefit from the smaller class environment, especially when curriculum-based tests are used as the learning criteria. A longitudinal analysis of a portion of the sample indicated that students in small classes outperform their peers in kindergarten classes of regular size and also gain more in reading outcomes during the second year. The question of why these effects are realized remains largely unanswered, but in light of these findings, is particularly important to pursue. (Finn & Achilles, 1990).<sup>2</sup>

**Structured abstract:**

**Background:** Class size reduction continues to attract attention as a school reform measure. Prior research on the effects of class size has been inconclusive, leading to ongoing controversy and debate about the magnitude, if any, of a “class-size effect” on learning outcomes for children.

**Purpose:** To assess the effects of a statewide experiment where class size was substantially reduced in kindergarten and first-grade classes.

**Setting:** 76 public elementary schools drawn from inner-city, urban, suburban, and rural locations in Tennessee. A total of 328 kindergarten classes and 347 first-grade classes participated in the study.

**Subjects:** 6,570 students enrolled in kindergarten in the 1985–1986 school year.

**Intervention:** Students were randomly assigned by project staff to one of three class types: small (13–17 pupils), regular (22–25 pupils), or regular with a teacher aide (22–25 pupils). Students assigned to small classes stayed in small classes for kindergarten and first grade.

**Research Design:** Randomized-controlled field trial.

**Data Collection and Analysis:** The Stanford Achievement Tests in reading and mathematics were administered in the spring of each school year, and a set of Tennessee curriculum-referenced tests were administered at the beginning of first grade. Means on each outcome measure were calculated for each class, then separately for White and minority students in each classroom. Two analyses were conducted using multivariate analysis of variance: a cross-sectional analysis of the entire first-grade sample and a longitudinal analysis of a subset of pupils ( $n = 2291$ ) who were in the study for both kindergarten and first grade and had complete SAT achievement test data.

**Findings:** Significant benefits of class size reduction were seen across all academic measures. The cross-sectional analysis of first graders yielded an overall difference of about one fourth of a standard deviation among students in small classes vs. regular classes. Minority students benefited in particular, averaging a difference of a third of a standard deviation over their regular class counterparts on five of the six academic measures. In the longitudinal analysis, students in small classes had a highly statistically significant advantage in reading and mathematics over regular classes in both kindergarten and first grade.

**Conclusions:** This study demonstrates that small classes have an advantage over larger classes in reading and mathematics in the early primary grades. The analysis also strongly suggests that small classes especially benefit the academic performance of minority students.

FIGURE 1. Comparison of actual paragraph-style narrative summary and proposed structured abstract for an original study that appeared in the Fall 1990 American Educational Research Journal.

rest of the articles, alleviating an early concern that the preparation of structured abstracts would require a substantial increase in editorial resources” (Haynes, Mulrow, Huth, Altman, & Gardner, 1990, p. 70).

The extent to which the structured abstract has permeated medical journals in a

relatively short period indicates that the structured abstract is practically useful and also fulfills a genuine need in medical research. However, there has been very little formal evaluation of the effects of the structured abstract in medicine, and this is an area in which education could provide

needed insights through close analysis of its implementation in a new field.

The structured abstract is an innovative and viable information tool that can help busy people in education access, assess, and disseminate education studies and research findings. In England, the structured abstract

<p><i>Background/Context:</i> Description of prior research on the subject and/or its intellectual context and/or its policy context.</p> <p><i>Purpose/Objective/Research Question/Focus of Study:</i> Description of what the research focused on and/or why.</p> <p><i>Setting:</i> Specific description of where the research took place.</p> <p><i>Population/Participants/Subjects:</i> Description of the participants in the study: who (or what), how many, key features.</p> <p><i>Intervention/Program/Practice:</i> Specific description of the intervention, including what it was, how it was administered, and its duration.</p> <p><i>Research Design:</i> Description of the research design (e.g., qualitative case study, quasi-experiment, secondary analysis, analytic essay, randomized-controlled field trial).</p> <p><i>Data Collection and Analysis:</i> Description of plan for collecting and analyzing data, including description of data.</p> <p><i>Findings/Results:</i> Description of main findings with specific details.</p> <p><i>Conclusions/Recommendations:</i> Description of conclusions and recommendations of author(s) based on findings and overall study.</p>
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FIGURE 2. Proposed template for a structured abstract for education research journal articles.

is already used by several journals that publish research in the social sciences, including the *British Journal of Educational Psychology*, the *British Journal of Psychiatry*, and the *British Journal of Clinical Psychology*. British psychologist James Hartley's recent research on the use of structured abstracts in social science journals has shown that structured abstracts are easier to read, more informative, and clearer than their traditional counterparts (Hartley, 1997, 1999; Hartley & Sydes, 1997).

Education over time has already developed a predictable format for journal articles. As mentioned earlier, this format consists of three basic elements for each article: title, listing of author(s) and institutional affiliation(s), and the body of the article. It also includes three additional elements common to most articles: a reference section; a short, paragraph-style narrative summary; and an acknowledgments section. In addition, general consensus has developed over preferred formats for tables and figures, where authors use a predictable structure to compress detailed information into a small space, allowing this information to be understood independent of the main body of the article.

As part of this gradual development of practical and efficient structures in education research to communicate key information to readers, we propose that a

more formal structured abstract replace the paragraph-style narrative summary and that structured abstracts eventually become part of the basic format of every journal article. The structured abstract is uniquely positioned to help research studies and findings reach people in education who can use them by providing a needed bridge between those with and without easy access to journal articles, between hard copy and digital modes of distribution, and, most important, between the worlds of education research and practice.

#### NOTES

The writing of this article was supported by a grant from the Andrew W. Mellon Foundation to the American Academy of Arts and Sciences. We are grateful to Robert Boruch, Brian Haynes, and James Hartley for sharing with us their insights about the use of structured abstracts in other disciplines. We also thank the journal editors and the four anonymous reviewers for suggestions that resulted in substantive changes and improvements to this article.

<sup>1</sup> The Source Journal Index database for ERIC, the federally funded Education Resources Information Center, listed 1,177 journals as of September 2003. More than 20,000 individual articles were indexed annually in ERIC from 1995 through 2000; in subsequent years, close to 20,000 individual articles have been published annually, but these articles are not yet fully indexed because this process takes several years to complete. While ERIC is com-

prehensive, there are at least a few education-related journals and articles that ERIC does not cover; thus, these figures are conservative.

<sup>2</sup> Copyright 1990 by the American Educational Research Association; reproduced with permission from the publisher.

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Manuscript received January 13, 2003  
Revisions received March 7, July 7, and  
September 18, 2003  
Accepted October 1, 2003