The 20,000 Article Problem:
How a Structured Abstract Can Help Practitioners Sort Out Educational Research

BY EDWARD J. MIECH, BILL NAVE, AND FREDERICK MOSTELLER

Structured Abstract

Background: Today over 1,000 education journals publish more than 20,000 articles in the English language each year. No systematic tool is available at present to get the research findings from these tens of thousands of articles to the millions of education practitioners in the United States who might use them.

Purpose: To help practitioners sort out findings from education research, we propose that education journals consider adopting a *structured abstract,* an innovation that focuses on the article format itself. The structured abstract would take the place of the paragraph-style narrative summary that appears at the beginning of most articles.

Intervention: A structured abstract is a formal and compact summary of an article's main features and findings. Like a table or figure, it has a predictable structure that compresses information into a small space and can be read independently from 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 elements that apply to all articles (background, purpose, research design, and conclusions) and several additional elements that apply to some articles but not to others (e.g., setting, population, intervention, data collection and analysis, and findings).

Research Design: Analytic essay.

Conclusions: The structured abstract offers a robust vehicle to help practitioners systematically access, assess, and communicate education studies and research findings.

ONE RECENT Saturday, Beth, a fourth-grade teacher in a large midwestern city, was talking on the phone with her sister Louise, who teaches fifth grade in a mid-size city in the Southeast. Louise was telling Beth about a state conference for educators that she had attended a few weeks earlier.

One of the keynote speakers at the conference had extolled the virtues of peer tutoring in reading for elementary students and had claimed that the research showed that this strategy benefited both the student being tutored and the student doing the tutoring. As Louise was talking, Beth was scanning a mental image of her own classroom, identifying students who might benefit from such tutoring. Beth thought she might try

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the idea, but when she asked for more details about how to set up the peer-tutoring process, Louise said that the speaker, a professor from the local teachers college, had not provided any such details in his talk, nor had he provided any references to specific articles that teachers could refer to for more information. "Well," Beth thought, "I'll just drive downtown to the university library and use their computers to find some articles on peer tutoring. How hard can that be? I learned how to do that in my graduate classes years ago."
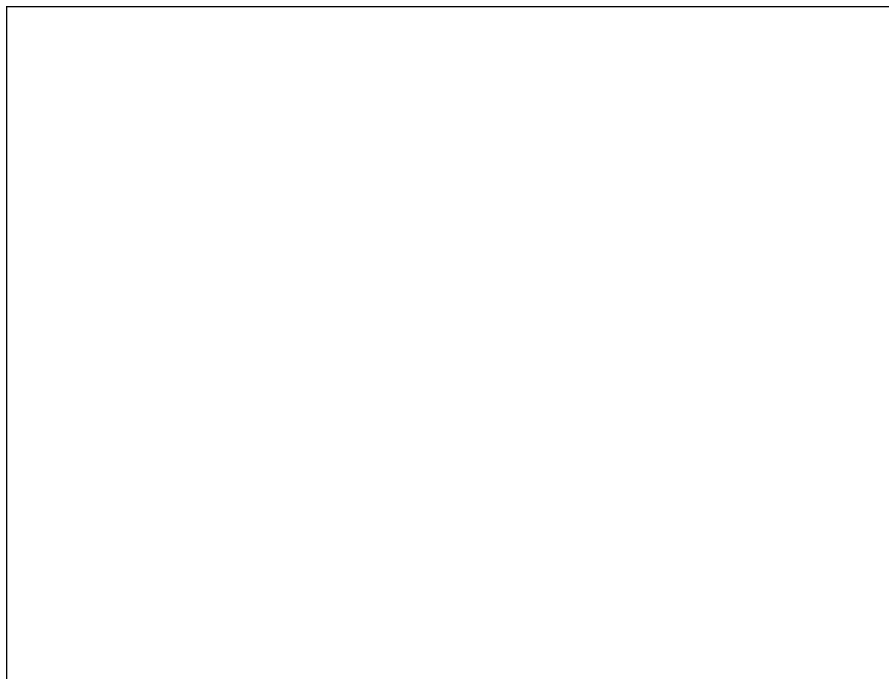
When Beth arrived at the library, she sat down at one of the computers in the reference section, pulled up the ERIC database, and typed in the key words "peer tutoring." Undaunted by the response that ERIC was prepared to display hundreds of articles that had something to say about peer tutoring, Beth began to scan systematically the titles and abstracts of the articles listed. She quickly found that she couldn't readily tell which of the articles might be the best source for the information she want-

ed. When she did find an article that seemed promising from its abstract, as often as not it turned out that this university library did not subscribe to the journal in which it had been published.

Several hours later, after scanning a dozen or so articles that the library did have on its shelves, Beth had photocopied three that had information that would help her set up her own peer-tutoring program in reading. But as she drove home, she kept thinking that there must be a better way, a more efficient way, to get information from relevant educational research into the hands of practitioners like her.

WHY RESEARCH DOESN'T REACH TEACHERS

As the hypothetical scenario above illustrates, educational research does not readily reach the people who might actually put it into practice. This breakdown in communication occurs in part because of several overlapping and complex issues. These include the large perceived gaps that separate the worlds

of educational research, practice, administration, and policy making; the sheer size and diversity of the education community, which in the U.S. alone has over 3.6 million teachers and 100,000 principals in elementary and secondary schools; and the sprawling nature of educational research, which has traditionally encompassed a wide variety of researchers, institutions, subject areas, agendas, contexts, and forums for publication.

However, there is also a technical dimension to this challenge of extending the reach of research studies and findings into the realm of educational practice, which we call here "the 20,000 article problem." At present, the *Kappan* is one of more than 1,100 education journals published in the English language. Collectively, they publish more than 20,000 articles each year. Practitioners can access these tens of thousands of articles in a fairly narrow set of ways: acquiring a hard copy of the journal article through a personal or an institutional subscription or through a library; gaining online access to the full text of an article through a journal's website or via a database service; receiving a copy at a conference or workshop; or obtaining a copy from a colleague who has access to the hard copy or digital versions of the article.

In addition to access, practitioners must also have the time and inclination to sort through the various journals to find and evaluate articles of potential interest. This threefold requirement of access, time, and motivation creates a serious bottleneck that restricts the flow of information and research findings to practitioners.

The structural innovation we propose here specifically addresses the 20,000 article problem: *how to help millions of people in education connect with the tens of thousands of articles*

published each year in education journals that might prove useful to them in practice. We believe that the structured abstract, an innovation that focuses on the format of the article itself, can help overcome the existing impediments to disseminating the findings of research. Below, we place the idea of a structured abstract in context and define its key elements.

CONTENT OVER FORM

Education journal articles, like educational research in general, address a broad and varied set of issues. Each journal makes its own editorial decisions and policies. As a result the published articles cover an astonishing variety of topics with a large assortment of research strategies. Beneath all of this variation, though, lies a familiar and predictable format for journal articles that the field of education shares with the other social sciences. This basic format of a research article always includes three elements:

- title,
- listing of author(s) and institutional affiliations, and
- the body of the article, often divided into sections focusing on introduction, analysis, findings, and conclusions.

A research article almost always includes three additional elements as well:

- a reference section,
- a short narrative summary or editor's introduction, and
- an acknowledgments section.

Any practitioner who walks into a library, picks up an education journal at random, and then chooses an article at random in that journal will almost certainly find at least five of these elements. Individual education journals may format each element slightly differently (e.g., where the institutional affiliation is listed, the style for the references section), but this set of elements is usually consistent across articles and across journals. *Kappan* articles, for instance, usually include some version of five of the six.

Four of these elements provide clues about the full article itself. The title suggests the topic, while the authors and their institutional affiliations and the acknowledgments can offer hints about the caliber, reputation, and perspective of the researchers. The short editor's introduction typically provides a general overview of the subject matter. The references indicate what prior research is considered relevant and to which ongoing discussions in research this article might contribute.

None of this partial information, however, either individually or collectively provides the detailed, specific information necessary to interpret and understand the findings and conclusions presented in the article. That information can be located and extracted only by scanning the body of the article to identify its key features, and readers must then consider them together when evaluating the published results. The time required to "size up" an article in this way depends on the skill and experience of the reader and on how well organized, well written, and thorough the body of the article is.

Thus the task of sorting out research findings in journal articles is often not an easy one. Moreover, the search becomes 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 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 educator that this detailed information may be sitting on the shelves of local libraries in the form of microfiche or bound journals.

Improving the dissemination of educational research therefore requires improving practitioners' access to detailed information about the various studies and research findings reported in journal articles. It also requires finding a better way to share and communicate these findings with others who might find them useful. At present, motivated individuals with access to full-text journal articles have a limited range of options for getting a study into the hands of others: they can photocopy, fax, or sometimes e-mail a copy of the article. Once the copy arrives in the recipient's in-box, however, the process starts anew, and the recipient must have the motivation, time, and skills to examine the study and its research findings to assess its relevance and importance to educational practice.

This traditional way of disseminating educational research allows the findings of many valuable studies to get lost in the shuffle. This well-known failure of research to reach practitioners may occur because of breakdowns at three key junctures in the flow of information and knowledge.

First, busy educators may not have the access, time, or motivation to scan scores of full-text journal articles in order to find the few articles of special interest to them. As a result, most choose to do without the benefit of education journals rather than to be overwhelmed by them.

Second, most computer-generated searches yield only sketchy and incomplete information about studies

and findings, and it is extremely difficult to appraise their relevance and importance to specific realms of educational practice.

Third, the format of the full-text journal article can compound the difficulties of disseminating educational research to others. Just as practitioners may find it labor-intensive to identify studies of special interest in the first place, those who later receive copies of those articles from colleagues may find it cumbersome to work through a 20-page article in an effort to determine whether or not it is relevant and useful to them.

THE STRUCTURED ABSTRACT

The structured abstract addresses all three of these issues. It occupies, both literally and figuratively, the middle ground between the title and main body of the article. The title hints at what an article is about, but it offers so little information that it is usually an unreliable marker. Just as readers shouldn't judge a book by its cover, they shouldn't judge an article by its title. The body of the article, on the other hand, provides the specific details necessary for a critical appraisal of a study and its findings, but it requires readers to commit themselves to working through a bundle of pages to locate the crucial information. And in the end, it might not be there.

At one to two pages long, the structured abstract 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. Thus it serves as an information tool that enables readers to consider and sort through large numbers of articles in search of studies of particular interest. The structured abstract also serves as a useful vehicle for sharing and communicating educational research, as its compact format is well suited for reaching the attention of practitioners who have many competing demands on their time. Moreover, it is a good fit with ongoing trends in technology, for it is a convenient size for e-mailing and for reading on portable handheld devices.

Finally, the structured abstract offers a balanced way for journals to provide relatively detailed information about studies and findings online, while still allowing a journal's publisher to maintain control over access to the journal's intellectual content. With the structured abstract freely available online, people conducting electronic searches will have access to an intermediate level of information about a study's key features and findings. This level of detail can help someone looking at a large number of articles to assess the kinds of research that have been conducted on a particular topic and to judge the general direction of the research findings. The structured abstract will also enable online researchers to decide which articles need to be accessed and read as full-text documents — a feature that is likely to lead to a greater overall demand for journal articles reporting research. These structured abstracts could also be made collectively available online through electronic information services.

A fundamental principle behind the idea of 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 like 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, i.e., it can be read and understood independently from the main body of the article.

Education journals would probably have slightly different versions of structured abstracts that would all convey essentially the same information, just as journals have different styles for presenting 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 (background, purpose, research

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Figure 1. A Template for a Structured Abstract

Background/Context: Description of prior research on the subject and/or its intellectual context and/or its policy context.

Purpose/Objective/Research Question/Focus of Study: Description of what the research focused on and/or why.

Setting: Specific description of where the research took place or was focused.

Population/Participants/Subjects: Description of the participants in the study: who, what, how many, and other key features.

Intervention/Program/Practice: Specific description of the intervention, including what it was, how it was administered, and its duration.

Research Design: Description of the kind of research design (e.g., qualitative case study, quasi-experiment, secondary analysis, analytic essay, randomized controlled field trial).

Data Collection and Analysis: Description of plan for collecting and analyzing data, including description of data.

Findings/Results: Description of main findings with specific details.

Conclusions/Recommendations: Description of conclusions and recommendations of author(s), based on the findings.

design, and conclusions) and five additional elements that apply just to some articles (setting, population, intervention, data collection and analysis, and findings). Figure 1 (preceding page) shows a template for a structured abstract that includes all nine elements.

As a rule of thumb, we recommend that structured abstracts be between 200 and 400 words in length. This provides sufficient space for a description of the key features and findings of a study yet still fits on at most two sheets of paper.

An example of a structured abstract — for the very article you're reading — appears at the beginning of this piece. Readers can judge for themselves how a 239-word structured abstract compares with the usual *Kappan* subheads, which are even briefer than most editorial notes that accompany research articles. If such structured abstracts were to become widely used, especially in journals that publish educational research, readers would be able to focus their limited reading time on those research articles that are most likely to be of immediate practical interest to them.

This innovation has enormous potential to extend the reach of educational research. The experience of the structured abstract in medical research provides a useful example from a different field of inquiry. In 1987, a call for the use of structured abstracts in medical journals appeared in the journal *Annals of Internal Medicine*. And that journal itself adopted the structured abstract format six months later.[1] The number of medical journals that voluntarily adopted the structured abstract grew exponentially, and within five years most of the leading medical journals in the United States and throughout the world had adopted some form of a structured abstract. Within three years of the original call,

the U.S. National Library of Medicine included the full text of structured abstracts in the federally funded MEDLINE database that is accessible and searchable by the public.

The adoption of the structured abstract has been reported as "straightforward" editorially: "After a brief settling-in period, editorial revisions have been no more extensive than for material in the rest of the articles, alleviating an early concern that the preparation of structured abstracts would require a substantial increase in editorial resources."[2] How far the structured abstract has permeated medical journals in a relatively short period indicates that it has proved both practical and genuinely useful in medical research. Very little formal evaluation, however, has been done on the effects of the structured abstract in medicine. Indeed, this is an area in which education could provide useful insights through close analysis of the implementation of the structured abstract in a new field.

The structured abstract is an innovative and useful information tool that can help busy people in education access, assess, and disseminate the findings of research. In England, the structured abstract 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*. Recent research into the use of structured abstracts in social science journals by British psychologist James Hartley has found that structured abstracts are easier to read, more informative, and clearer than their traditional counterparts.[3]

Over time, education journals have developed a predictable format for articles that report research findings that are potentially useful to practi-

tioners and other researchers. But the potential value of educational research to practice can be realized only if these research studies and their findings actually reach those who can use them. No one should assume that important research studies and findings automatically make their way into the world of educational practice. Journals such as the *Kappan* are particularly important forums for disseminating research findings, for they provide stable, institutional vehicles for the publication of new and original research on a broad array of educational issues.

We suggest that a more formal structured abstract should replace the editor's introduction (or subhead) and that structured abstracts should eventually become part of the basic format of every article in this and in other journals. The structured abstract provides a much-needed bridge between those who conduct research and those who need to use its findings. It can make the findings of research readily available to those without direct access to the original research journals. And it can easily mesh with electronic modes of distribution. We believe that the use of structured abstracts in disseminating educational research is an innovation whose time has come.

1. Ad Hoc Working Group for Critical Appraisal of the Medical Literature, "A Proposal for More Informative Abstracts of Clinical Articles," *Annals of Internal Medicine*, vol. 106, 1987, pp. 598-604.

2. R. Brian Haynes et al., "More Informative Abstracts Revisited," *Annals of Internal Medicine*, vol. 113, 1990, pp. 69-76.

3. James Hartley, "Is It Appropriate to Use Structured Abstracts in Social Science Journals?," *Learned Publishing*, vol. 10, 1997, pp. 313-17; James Hartley and Matthew Sydes, "Are Structured Abstracts Easier to Read than Traditional Ones?," *Journal of Research in Reading*, vol. 20, 1997, pp. 122-36; and James Hartley, "Applying Ergonomics to *Applied Ergonomics*: Using Structured Abstracts," *Applied Ergonomics*, vol. 30, 1999, pp. 535-41. Hartley has investigated the potential benefits of structured abstracts in social science research for more than a decade.   **K**

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