# Editorial: A New Direction for the IEEE TRANSACTIONS ON EDUCATION: Part II. Increasing the Relevance of Your Manuscript

## I. INTRODUCTION

MEMBERS of the global community of engineers and educators share their work through the IEEE TRANSACTIONS ON EDUCATION. To enhance this interaction, the Editorial Board (Associate Editors and Editor-in-Chief) intends that the journal will emerge as the definitive source of scholarship for education in electrical engineering, computer engineering, software engineering, computer science, and other fields within the scope of interest of the IEEE. For this to be accomplished, the quality and value of the published work must increase. One step toward this goal has been to develop and propagate new review criteria, adopted in July 2013 [1], that articulate expectations for published papers. This is the second in a series of editorials designed to help authors address these review criteria effectively, and thus improve the likelihood that their manuscripts will be accepted.

## II. REVIEW CRITERIA AND THREE AREAS OF SCHOLARSHIP

The IEEE TRANSACTIONS ON EDUCATION publishes original scholarly contributions to electrical engineering, computer engineering, software engineering, computer science, and other fields within the scope of interest to the IEEE. In writing the review criteria, the Editorial Board started with three areas of scholarship from the framework developed by Boyer [2]: discovery, application, and integration. They then constructed review criteria for each area of scholarship. Six of the criteria are common across the three areas of scholarship: relevance, context, findings, conclusions, organization and clarity, and illustrations. The focus of this editorial is the criterion of relevance; specifically, how can authors increase the relevance of their manuscript?

## III. RELEVANCE

Relevance is characterized differently for the three areas of scholarship.

- *Scholarship of Application*: How relevant are issues, practices, and applications described in the manuscript to education in electrical engineering, computer engineering, and fields within the scope of interest of IEEE? How explicitly and clearly are significant issues articulated? How much interest is there among engineering educators in the issues, practices, and applications presented in this manuscript?
- *Scholarship of Discovery*: How relevant is the research described in the manuscript to education in electrical engineering, computer engineering, and fields within the scope of interest of IEEE? How explicitly and clearly are significant issues articulated?
- *Scholarship of Integration*: Is the need for the anticipated synthesis justified sufficiently? How relevant is the synthesis described in the manuscript to education in electrical engineering, computer engineering, and other fields within the scope of interest of IEEE? How explicitly and clearly are significant issues articulated?

Although details of relevance differ across the three areas, the central question is the same: To what degree will the global community that reads the TRANSACTIONS be interested in the manuscript being evaluated? The remainder of this editorial is intended to help authors address this central question.

## IV. TWO CONTRASTING EXAMPLES

This section offers two contrasting examples of how authors might address relevance. These examples are not taken from actual manuscripts, but rather combine features common to many recently submitted manuscripts.

### A. Example 1

In this manuscript, the authors describe details of their program and their institution. Description of the work (e.g., application, research, or synthesis) focuses on why the work was done to address local needs (sometimes described in extensive detail) and how the work was accomplished in the context of the specific program. The authors conclude that the work benefited their specific program.

### B. Example 2

In this manuscript, the authors identify an issue common to programs (e.g., electrical engineering, computer engineering, software engineering, computer science, etc.) across the globe. They describe why the issue is significant for many diverse programs and how they were motivated to address this issue. The authors may provide details about how the issue manifests itself in their program at their institution, but the focus is on the common issue. When describing development of an application, they focus on challenges that faculty members teaching similar

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subjects are likely to face. When writing conclusions, the authors emphasize potential benefits or insights for a broad spectrum of programs.

Clearly, the second example is more effective in addressing relevance.

## V. Steps to Increasing Relevance

There are many different ways in which an author can perform work, and then prepare manuscripts to report this work, that will help the eventual readers see connections to their own situations. The following recommendations, while not exhaustive, may help authors increase relevance.

- Identify issues likely to resonate with faculty members at multiple institutions. For example, many programs teach courses in electronics. What are common problems that students have learning electronics?
- Identify a common trend of changes in instructional strategies, e.g., increasing use of instructional strategies (variously referred to as blended learning, flipped classrooms, inverted learning, or hybrid learning) or the growing use of massively open online courses (MOOCs). Manuscripts addressing global trends will be relevant to many researchers/instructors.
- Often, faculty members engage in conversations with other faculty members teaching similar courses. What common threads run through these exchanges?
- Before starting to write the manuscript, the author should identify the key idea to be presented and decide if it is applicable only at a very local level (i.e., within a particular discipline, institution, environment, etc.) or if the idea has wider application. A more portable idea can be applied by a larger proportion of readers/reviewers, and thus be more relevant.
- What concepts and/or skills do students struggle to master in a particular course? How widespread are these student experiences? What evidence could be provided to support the assertion that many students struggle with the same challenge? What published papers supported this assertion?
- Many programs within the scope of interest of the IEEE have been accredited. Are there components of the work presented in the manuscript that can address accreditation requirements or specific program learning outcomes, such as ethics, lifelong learning, design, problem solving, etc., and that would be applicable in other contexts?
- Is the manuscript addressing a long-standing problem that can now be solved because of recent developments in pedagogy or technology?
- Instructional strategies supported by results synthesized from multiple cohorts either across multiple institutions or over multiple years may be more useful, and therefore more valued by reviewers, than instructional strategies supported by results from one cohort of students.
- Novelty of a focus in a manuscript should be highlighted by comparing it to similar papers in the literature. If no papers can be found that have tried a similar approach, then the innovation should be highlighted.
- Consider other papers that you have read. Did some seem more relevant to you, as a reader? What did the authors do to help establish relevance?

## VI. Evaluating Relevance

Authors, reviewers, and the Editorial Board evaluate relevance. To some degree, this is a subjective perception, contingent upon the individual's professional experience, situation, and goals. Research on cognition reported in, for example, the book *Thinking Fast and Slow* [3], suggests that in any evaluative process, the autonomous part of the mental system (called "System 1" in [3]) presents immediate judgments of relevance based on the individual's personal experience. A challenge for anyone evaluating relevance of a manuscript is thus to temper immediate personal reactions by considering their perspective of the global community who educate future generations of engineers. In order to reach a solid judgment regarding relevance, an individual must strive for distance and perspective [4] before deciding if typical members of the global community served by the journal would find a manuscript relevant. Individual opinions about relevance may differ, but judgments based on recommendations from multiple reviewers will provide a sound final evaluation.

## VII. Conclusion

In summary, this editorial has made four points.

- Establishing the relevance of the manuscript is crucial.
- Manuscripts should be written with the intent to address relevance.
- Many different approaches can be taken to increasing relevance, both when performing the work and when preparing a manuscript.
- Evaluating relevance requires inclusion of perspectives beyond those of the individual reviewer.

As the relevance of published papers increases, the value of the Transactions to its readers will grow. We encourage authors to contribute to this scholarly effort. Future editorials will offer guidance and recommendations with respect to other review criteria.

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## References

[1] J. E. Froyd, "Editorial: A new direction for the IEEE Transactions on Education: Part I. Developing shared understanding of the scholarship of application," *IEEE Trans. Educ.*, vol. 56, no. 4, pp. 373–376, Nov. 2013.

[2] E. L. Bover, *Scholarship Reconsidered: Priorities of the Professoriate*. Princeton, NJ, USA: Carnegie Found. Adv. Teaching, 1990.

[3] D. Kahneman, *Thinking Fast and Slow*. New York, NY, USA: Farrar, Straus, and Giroux, 2011.

[4] C. Heath and D. Heath, *Decisive: How to Make Better Choices in Life and Work*. New York, NY, USA: Crown Business, 2013.

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