# Expertise of the *EDGJ* Review Board: Implications for the Future of the EDGD and *EDGJ*

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**Introduction**

The peer review process is nearly universal as a means for sustaining standards of excellence. In academic settings, scholarly peer reviews are conducted to judge the suitability of manuscripts for publication. As a result, there is at least the perception of academic quality.

Triaridis and Kyrgidis (2010) concluded that maturation of the peer review process was slow and somewhat chaotic. Furthermore, they noted that by the late 20th century many journals were obligated to adopt the peer review process out of necessity due to the increasing competition among journals for quality manuscript submissions and as a result of increasing specialization.

It has been observed that little evidence exists to support the use of the peer review process to ensure journal publication quality; however, the absence of evidence does not preclude excellence in journal publication (Jefferson, T., Rudin, M., Brodney Folse, S., & Davidoff, F., 2007). This has been attributed in part to the motivation of the reviewers themselves and their "…passion for their area of research and the desire to help advance their field" (Nature Medicine, 2007).

According to A. C. Clark and F. M. Croft (personal communication, June 10, 2012), the composition of the *EDGJ* review board was last examined during the 1999 Mid-Year Conference held at Ohio State University. The *EDGJ's* editor at that time, J. A. Birchman, noted that the focus was on (a) establishing reviewer term limits to provide others with the opportunity to serve and (b) identifying reviewer expertise (personal communication, June 18, 2012).

Most would probably agree that this is a prudent course of action. Properly administered, establishing reviewer term limits has the potential to reduce reviewer fatigue and facilitate the inclusion of more diverse perspectives that reflect the focus and scope of the EDGJ. This is significant as the nature of what comprises research and teaching in engineering design graphics continues to change over time.

Since 2006, one reviewer stepped down from the review board due to retirement from academe and three new reviewers were added. However, the addition of the new reviewers was based solely on expressed interest in serving on the board, not on area of expertise or any other specific criteria.

The intent of this study was to continue the work begun by Birchman in 1999 and to ultimately codify a process for administering the *EDGJ* review board. To do that, this study needed to characterize the *EDGJ* review board, factually and accurately. To an extent, the descriptors that characterize the *EDGJ* feature articles that are indexed by the Education Resources Information Center (ERIC) and the frequency with which the descriptors are used to characterize *EDGJ* feature articles indexed by ERIC suggests the level of review board expertise. The list of descriptors used to index *EDGJ* feature articles and the frequency with which they have been used to index *EDGJ* feature articles appears in Figure 1.

| | | |
|---|---|---|
| Engineering Education (94) | Models (18) | Science Curriculum (7) |
| Higher Education (85) | *Geometric Concepts (16)* | Three Dimensional Aids (6) |
| *Engineering Graphics (62)* | Engineering Technology (16) | Industrial Education (6) |
| *Computer Graphics (55)* | Design (16) | Curriculum (6) |
| *Visualization (46)* | Course Descriptions (13) | Student Attitudes (6) |
| *Computer Assisted Design (46)* | Educational Technology (13) | College Students (6) |
| *Spatial Ability (44)* | Physical Sciences (12) | Academic Achievement (5) |
| Science Education (33) | Technical Education (11) | Freehand Drawing (5) |
| Computer Uses in Education (32) | Curriculum Development (10) | Instructional Effectiveness (5) |
| College Science (31) | Geometry (10) | *Geometric Constructions (5)* |
| Computer Software (30) | Course Content (10) | Student Evaluation (5) |
| Teaching Methods (30) | Technology Education (9) | Student Projects (5) |
| Computer Assisted Instruction (27) | College Curriculum (9) | Foreign Countries (5) |
| Computer Simulation (25) | *Engineering Drawing (9)* | Undergraduate Study (5) |
| Engineering (23) | Science Instruction (9) | College Freshmen (5) |
| *Drafting (22)* | Graphic Arts (8) | Testing (4) |
| Problem Solving (21) | *College Instruction (8)* | |

*Figure 1. Descriptors That Characterize EDGJ Feature Articles.*

**Method**

Sample. Given the number of review board members and the intent of the study, the entire population of review board members was surveyed (N=14).

Instrumentation. In order to maximize the return rate, minimize the time and costs required for data entry, and minimize data entry errors, data were collected by means of an online survey. Given the sample size, it can be argued that the more prudent approach would have been to collect the data by means of telephone interviews. However, given the ease with which online surveys can be constructed and administered, the researchers opted for the online means for data collection. A table of instrument specifications was developed to ensure construction of the instrument coincided with the intent of the study.

Data Analysis. Because the goal of this study was to describe an existing phenomena, data analysis were limited to the production of descriptive statistics—i.e. measures of central tendency, measures of dispersion, measures of the distribution's shape, and measures aimed at describing the more unusual members of a population.

**Results**

The Review Board. Twelve of the fourteen review board members responded within the response period for an 86% response rate. Table 1 depicts the review board's membership experience in years.

*Table 1. Review Board Membership Experience Reviewing for the EDGJ.*

| Years | N | % |
|---|---|---|
| 1-3 | 2 | 17 |
| 4-6 | 4 | 33 |
| 7-9 | 1 | 8 |
| 10-12 | 3 | 25 |
| 13-15 | 1 | 8 |
| more than 15 | 1 | 8 |

Review Board Member Expertise. The review board members were provided an alphabetized list of the 50 ERIC descriptors that characterize *EDGJ* feature articles currently indexed by ERIC. In an attempt to ascertain the review board's expertise, the members were asked to self-report and rate, on a one to four scale, their level of expertise—none, low or limited expertise, moderate or some expertise, and an expert or almost an expert respectively.

Expertise was defined as knowledge, skills, and experience with respect to the descriptors used to index and retrieve feature articles published in the *EDGJ*. The results of the self-rating of descriptors by the review board members in terms of their expertise appears in Figure 2 and reflects the overall self-reported strength of the review board.

| | | |
|---|---|---|
| Academic Achievement (3.00) | Drafting (3.83) | Physical Sciences (2.50) |
| College Curriculum (3.08) | Educational Technology (3.00) | Problem Solving (3.17) |
| College Freshmen (3.00) | Engineering (2.83) | Science Curriculum (1.92) |
| College Instruction (3.42) | Engineering Drawing (3.75) | Science Education (2.00) |
| College Science (2.17) | Engineering Education (3.17) | Science Instruction (1.83) |
| College Students (3.17) | Engineering Graphics (3.75) | Spatial Ability (3.42) |
| Computer Assisted Design 4.00) | Engineering Technology (2.92) | Student Attitudes (2.92) |
| Computer Assisted Instruction (3.00) | Foreign Countries (2.33) | Student Evaluation (2.92) |
| Computer Graphics (3.58) | Freehand Drawing (3.08) | Student Projects (3.17) |
| Computer Simulation (3.00) | Geometric Concepts (3.67) | Teaching Methods (3.00) |
| Computer Software (2.92) | Geometric Constructions (3.58) | Technical Education (3.00) |
| Computer Uses in Education (3.17) | Geometry (3.17) | Technology Education (3.00) |
| Course Content (3.33) | Graphic Arts (2.50) | Testing (2.92) |
| Course Descriptions (3.17) | Higher Education (3.00) | Three Dimensional Aids (3.17) |
| Curriculum (3.17) | Industrial Education (2.75) | Undergraduate Study (2.92) |
| Curriculum Development (3.25) | Instructional Effectiveness (2.67) | Visualization (3.50) |
| Design (3.25) | Models (3.09) | |

*Figure 2. Expertise of the EDGJ Review Board.*

Association. The strength of the association between the frequency with which descriptors were used by ERIC to index feature articles published by the *EDGJ* and the level of expertise of the *EDGJ* review board yielded a coefficient of correlation where r = .2376. Analysis of a significant linear relationship and aptness of linear fit resulted in the acceptance of the two null hypotheses: the true slope is zero and the true correlation is zero.

**Discussion**

While there was a positive linear association between the two variables, an analysis of the data suggested this association was not strong enough to justify the use of these data to make practical decisions about the composition of the *EDGJ* review board. This disparity may to an extent be due to

the fact that ERIC has been indexing EDGJ articles since 1987 (v50, n1), or for about 25 years. Only one review board member has more than 15 years of experience reviewing for the *EDGJ*.

Future work on ascertaining the level of expertise of the *EDGJ* review board should include paring down the two data sets, identifying outliers, and undertaking further analysis. As an example, according to the self-reported data by the review board members, the top ten descriptors were Computer Assisted Design, Drafting, Engineering Drawing, Engineering Graphics, Geometric Concepts, Computer Graphics, Geometric Constructions, Visualization, College Instruction, and Spatial Ability. This is in contrast to the frequency of descriptor use by ERIC to index *EDGJ* feature articles, which appears in Figure 1 in italics.

**References**


Engineering Design Graphics Journal. (2012). Focus and Scope. *Engineering Design Graphics Journal.* Retrieved from http://www.edgj.org/index.php/EDGJ/about/editorialPolicies#focusAndScope

Jefferson, T., Rudin, M., Brodney Folse, S., & Davidoff, F. (2007). Editorial peer review for improving the quality of reports of biomedical studies. *Cochrane Database Syst Rev. 2007 Apr 18.* Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17443635

Nature Medicine. (2007). Why review? *Nature Medicine*, 13(8). Retrieved from http://www.nature.com/nm/journal/v13/n8/full/nm0807-887.html

Triaridis, S., & Kyrgidis A. (2010). Peer review and journal impact factor: the two pillars of contemporary medical publishing. *Hippokratia*, 14 (Suppl 1). Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3049421/