

A Methodological Analysis of Articles Published in Malaysian Journals of Education

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Abstract: *The purpose of the study was to survey the research techniques reported in articles published in Malaysian educational journals, and to identify the standards that are deemed acceptable by these journals for assessing the adequacy of empirical research methods used in the articles. The study also explored differences between Malaysian journals and two prominent international journals in education with respect to the standards they adhered to when documenting methodological variables. To attain these objectives, all articles published between 1991 and 1997 in selected Malaysian journals were content-analyzed and compared to those published in the highly respected international journals from 1995 onwards. For each article, variables pertinent to research design and methods, sources of data, data collection procedure, and statistical analysis were coded using a structured checklist. Results were consistent with those of other studies in that: (i) there were a substantial number of studies using qualitative techniques, and more studies were qualitative than quantitative in nature, (ii) the most commonly used inferential techniques in the Malaysian journals were the ANOVA-based procedures, and (iii) the standards for documenting methodological adequacy deemed acceptable by the Malaysian journals did not exactly reflect the state of the art.*

Periodic updates of data on research methods reported in the literature give useful information about research theories and practices in education. The data would indicate the degree of "fit" between research methods taught in graduate level university courses and actual research practices.¹ In the researcher's opinion, a methodological analysis on the research works published in professional journals would at least create a greater awareness of the predominant research

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techniques and the changing patterns of their applications. The findings would be of special interest to educational researchers, lecturers of research methodology and educational statistics courses, and aspiring master's and doctoral candidates. Of particular significance, a documentation of actual research practices may provide a defensible empirical basis for research, and for instructional and curriculum development practices.

Although convincing arguments have been made in favor of periodic analysis, not enough effort has been devoted to reviewing the prevailing research practices in education, especially in Malaysia. Consequently, existing empirical evidence regarding the nature of research methods in educational journals is limited. Despite a plethora of studies reported in selected APA journals that have surveyed major statistical techniques,² information on the standards adhered to by the editorial boards of the journals when assessing methodological adequacy is either lacking or unavailable. Similarly, studies available in the literature which have addressed the adequacy of methodological standards used by the editorial boards of the professional journals are limited to specific issues,³ or specialized areas of study, for example reading.⁴

In addition, much of the analysis in the above works focussed on research reported in American journals. Thus far, not much is known about the use of educational research methods in other parts of the world, including that reported in the Malaysian educational journals. There appears to be a lack of understanding about the research techniques acceptable to the editorial boards of Malaysian journals, and the degrees of rigor exercised by them, albeit the first journal in education was published almost three decades ago in 1970. Therefore, the need to seriously examine the research techniques predominant in Malaysian educational journals is both appropriate and timely.

With an aim to fill the gap in the literature, this study explored the techniques used in educational research reported in Malaysian journals since 1991. More specifically, the study surveyed the techniques of empirical research documented in these journals. In addition, it identified the standards that the journals deemed acceptable for methodological adequacy with special emphasis on the quantitative research. To enrich information, the researcher compared the techniques of research and the standards set for documenting methodological variables between articles published in the Malaysian journals and the prominent international journals in education.

The literature suggests that the approaches followed in classifying research techniques are many. One approach found in a previous inquiry used a disciplined-based classification scheme.⁵ Another approach involved a categorization of research methods according to statistical techniques.⁶ An approach that integrated these two schemes has also been adopted.⁷

Regardless of the variation in the classification schemes, the researcher has identified a particular theme recurring in these works; the use of educational research techniques appears to change across time. Elmore and Woehlke found that the use of ANOVA-based techniques was predominant in the 1979-1983 AERJ articles, but more recently they observed that the preference had shifted to the application of intermediate statistics (multivariate analysis, data reduction schemes and nonparametric statistics).⁸ Elmore and Woehlke also noted that there were an increasing trend in the use of advanced statistical techniques (e.g., factor/cluster analysis, LISREL, Bayesian statistics, and modeling), and substantial increases in the use of "graphic" and "qualitative" methods.⁹

With regard to the issue of methodological adequacy, Venezky (1984) claimed that, "A bad study of an important issue can be more informative than an elegant study of a meaningless issue."¹⁰ However, research that contains serious flaws in its methods and statistical analysis may lead to faulty conclusions or ideas about education and teaching which, if implemented indiscriminately, could create deleterious consequences in curriculum and classroom practices. To reduce the likelihood of deriving inaccurate conclusions from methodologically unsound research and, thus, questionable findings, much effort has been made, especially in quantitative research, to establish firm methodological standards. A classic example of this effort is the work of Campbell and Stanley who identified classes of methodological variables that can represent threats to internal validity of a research.¹¹

To ensure a reasonable degree of internal and external validity, many contemporary textbook writers have suggested that a study disclose the following information: (i) sampling procedure; (ii) unit of statistical analysis; (iii) psychometric properties of the measuring instrument; (iv) response rate/mortality rate; (v) results of tests for statistical assumptions; (vi) protection against the inflation of error rate; (vii) statistical power; and (viii) detailed description about the characteristics of the sample and setting. Surprisingly, however, a

cursory review of the related literature revealed that authors ignored these “standards.” For example, Willson discovered that less than half (45%) of the ANOVA-based studies had applied random assignment, and only 15% had used random selection of experimental subjects.¹² Also, not very many articles had stated the reliabilities of their measures, for example 34% in Ridgeway, Dunston and Qian’s analysis¹³ and 55% in Willson’s review.¹⁴ Accordingly, it is interesting to see if the same lax practice persists in local journals.

A number of factors determine a researcher’s adherence to methodological standards. Two of these factors are his knowledge—declarative, procedural and conditional—and his beliefs about research. A researcher’s set of beliefs about research is embedded within a value system that is strongly dictated by his religious background and cultural affiliation. In simple terms, there is likely a strong association between a researcher’s conformity to methodological standards and his religion and culture. In the Islamic heritage, in particular, Muslim scholars have been observing accepted methodological standards very strictly,¹⁵ the failure of which would affect their status as a scholar. In their practice of research, Muslim scholars have evidently placed a great emphasis on adherence to methodological standards. The manifestation of this value is distinctly visible in their works. Based on this premise, this study attempted to explore the possible relationship between religious and cultural variables and a researcher’s adherence to accepted methodological standards in educational research. More specifically, the study intended to examine the patterns of conformity to methodological standards between Malay Muslim researchers and their non-Malay, non-Muslim counterparts.

METHOD

All articles published in *Jurnal Pendidikan* (University of Malaya) and *Jurnal Pendidik dan Pendidikan* (Universiti Sains Malaysia) from 1991 to 1997 were examined. The study included publication since 1991 in order to increase analytical precision, although a five-year coverage of research articles is sufficient even if the objective is to identify trends in the use of research methods.¹⁶ To provide reasonable quantitative comparisons, only those articles published between 1995 and 1997 in the American Educational Research Journal (AERJ) and the British Educational Research Journal (BERJ) were reviewed (Table 1). Articles that were not based on empirical research, such as book reviews, statistical derivation, measurement validation, research using

simulated data, and conceptual and theoretical expository, were omitted from this study. Also, the articles that appeared in volume 32 (1) of the 1995 AERJ were not reviewed because the issue was not retrievable from the local libraries.

The selection of the two Malaysian educational journals was based on *a priori* consideration. These are the two most credible and consistent local publication channels for researchers to present their work. The AERJ and BERJ were selected for this survey because they are internationally acclaimed and highly regarded in the educational community, and also because they focus on quantitative and qualitative empirical research.¹⁷

To conduct a content analysis, the researcher constructed a review checklist. It is a coding scheme that comprises variables related to research techniques, sampling, data collection procedures, and statistical analysis. In this study, the categories used to code research techniques were experimental, survey, correlational technique, qualitative technique, and a blend of quantitative and qualitative techniques. The categorization was based on disciplinary philosophic traditions rather than on statistical techniques as subscribed by to earlier reviewers.¹⁸ To identify the methodological standards subscribed to by both the Malaysian and international journals, eight additional variables were coded for each article: (1) sampling technique; (2) validity of the instrument; (3) estimate of reliability; (4) response rate/mortality rate. (5) statistical technique; (6) treatment of statistical power. (7) treatment of statistical assumption; and (8) protection against inflation of error rate.

A total of 250 articles were examined and of this number, 60% (158) were found to have satisfied the stated inclusion criterion; these are the articles reporting the results of empirical works (Table 1). Of these selected articles, 89 reported the use of statistical analysis and almost one-third (60) used inferential techniques in their analysis of data (Table 2). It should be clarified that since the researcher was the only coder, stability indices were estimated to document intra-coder reliability, and the intra-coder agreements were found to range between 81% and 100% (Table 3).

RESULTS

The following presentation of data analysis first addresses the frequency of research techniques used in the three categories of educational journals (Malaysian, American and British), and then

compares the standards of documenting methodological variables accepted by these journals. The discussion on the latter aspect focuses on several selected elements of internal validity of the 60 research articles that used inferential statistics.

Techniques of Educational Research

Table 1 summarizes the percentage and frequency distribution of research techniques used in the Malaysian educational journals, AERJ and BERJ. Of the 48 articles published in the two Malaysian journals, a majority (50%) used survey and correlational techniques. Only 8.3% of the articles used experimental techniques, most of which applied non-equivalent group comparisons. In addition, a substantial number of the articles used either qualitative (29.2%) or a blend of qualitative and quantitative techniques (12.5%). These empirical qualitative studies attempted to describe naturally occurring educational phenomena. They emphasized holistic interpretation by taking into account the social-cultural context of the behaviors of interest. Basically these studies were influenced by the qualitative traditions of ecological psychology, ethnographic of communication or symbolic interaction and they adopted techniques and approaches including case study, action-research, participant observations, and in-depth interviews.

Table 1: Percentage Distribution of Reported Research Techniques

<i>Techniques</i>	<i>1991-1997 (n)</i>	
	<i>Malaysian Journals</i>	<i>1995-1997 (n)</i> <i>AERJ</i> <i>BERJ</i>
Experimental	8.3 (4)	17.2 (10) 3.8 (2)
Survey/Correlation	50.0 (24)	41.4 (24) 34.6 (18)
Qualitative	29.2 (14)	32.8 (19) 53.8 (28)
Combination of Methods	12.5 (6)	8.6 (5) 7.7 (4)
Total	48	58 52

A somewhat similar pattern of distribution in the use of research techniques characterized the articles published in the AERJ. Although the American journal published more research works that used experimental designs (17.2%) compared to the Malaysian journals, the most frequently used methods in the AERJ were surveys and correlational techniques (41.4%). The AERJ editorial board seemed to have given a fair amount of attention to qualitative techniques (32.8%). Also, an almost equal number of articles in each journal combined qualitative and quantitative research techniques. The BERJ, however, presented more (53.8%) researches using qualitative techniques compared to the other journals, and gave little emphasis to articles using experimental design. Only 3.8% of experimental research were published in the British Educational Journal.

A pertinent variable of interest is the distribution of statistical techniques across 89 articles that had used statistics, be they inferential or descriptive, in their data analysis. Table 2 shows the distribution of the techniques according to categories of publication. Two features were outstanding. First, the most frequently used analysis in the Malaysian journals was the descriptive statistics. Second, the data indicated that in the Malaysian educational journals, a majority (17.1%) of the inferential techniques employed ANOVA-based procedures, including one way ANOVA, factorial ANOVA, and ANCOVA.

Surprisingly, none of the Malaysian-based articles employed multivariate analysis or modeling techniques. Modeling allows for an empirical testing of a theoretical model. It includes hierarchical linear regression, logistic regression, structural equation model, multi-dimensional scaling, path analysis, LISREL, and confirmatory factor analysis. Multivariate techniques such as MANOVA, MANCOVA, repeated measures ANOVA, multivariate regression, cluster analysis, and discriminant analysis provide protections against the inflation of error rate when testing several dependent measures simultaneously.

In comparison, multivariate analysis and modeling were the most commonly employed inferential techniques reported in the AERJ, each of which had a frequency of 33.2%. Although 41.7% of the BERJ articles merely applied descriptive statistics, a percentage comparable to that of the Malaysian articles (58.9%), a good 20% applied advanced procedures, the modeling techniques, to address their research problems. Advanced statistical procedures were not used in any of the Malaysian-based articles.

Table 2: Percentage Distribution of (Major) Statistical Techniques

<i>Statistical Technique</i>	<i>1991-1997 (n)</i>		<i>1995-1997(n)</i>	
	<i>Malaysian Journals</i>		<i>AERJ</i>	<i>BERJ</i>
Descriptive	2.9 (18)		3.2 (1)	41.7 (10)
Correlation	8.8 (3)		-	8.3 (2)
t-test	5.9 (2)		3.2 (1)	-
ANOVA-based	17.7 (6)		19.4 (6)	12.5 (3)
Multiple Regression	2.9 (1)		6.5 (2)	-
Multivariate Analysis	-		33.2 (10)	8.3 (2)
Modeling	-		33.2 (10)	20.8 (5)
Data Reduction	2.9 (1)		-	-
Non-Parametric	5.9 (2)		-	8.3 (2)
Combination of Parametric & Non- Parametric	2.9 (1)		3.2 (1)	-
Total	34		31	24

Acceptable Methodological Documentation

It should be emphasized that the present study did not attempt to judge the degree or the quality of methodological rigor—with respect to validity—which researchers adhered to when conducting their research. Rather the study aimed at identifying the levels of rigor accepted by each journal's editorial board in reviewing articles that used inferential techniques. To address this concern, a number of conventionally accepted criteria were considered. Table 3 describes the prevalence of six of the criteria in the journals under study.

Of the 16 inferential studies published in the Malaysian journals, only 12.5% employed randomization in selecting and assigning units of analysis. In contrast, 50% of the articles adopted the non-probability sampling procedure, while the remaining articles (37.5%) gave no information about the criterion. Therefore, the results showed that a majority (87.5%) of the studies accepted for publication in the Malaysian journals did not use random sample although they applied inferential statistics to yield their findings.

In comparison, moderately high percentages of the studies in AERJ (40%) and BERJ (35%) did not indicate the use of randomization. Furthermore, there were five studies in each of the respectable journals that analyzed secondary data to address their research problems, rendering it difficult to determine how the samples had been selected.

With respect to instrumentation, there are several noteworthy results. First, only 56.3% of the articles in the Malaysian journals attempted to establish the validity of their measures. On the other hand, more than 60% of the works published in the AERJ and BERJ indicated the validity of their instruments; some of them at least made references to previous studies. Second, the Malaysian journals accepted more research works that did not indicate the response rate for their instrument, compared to the AERJ and BERJ. The percentages of reporting the response rate in these journals were 18.8%, 53.3% and 28.6% respectively. Third, while only about one-third of the articles in the Malaysian journals (and BERJ) explicitly reported the estimates of reliability, a majority (73.3%) of the articles accepted by the AERJ were found to indicate the consistency index.

Fourth, this study also found that the lowest response rate accepted by the Malaysian journals was 52% ($M = 64.4$), while the lowest rates accepted by the AERJ and BERJ were 45% ($M = 79.6$) and 43% ($M = 68$) respectively. Fifth, the lowest degree of reliability that appeared in the Malaysian journals was .42 compared to .59 for the AERJ and .62 for the BERJ. However, the results should be interpreted with caution because the different studies had used different correlation techniques.

Finally the study found that none of the articles gave any information about the statistical power, protection against the inflation of family-wise error rate and the treatment for statistical assumptions. This finding is ironic because the use and the importance of these variables are covered even in introductory textbooks on statistics.

Table 3: Acceptable Standards According To Selected Elements of Internal Validity

<i>Elements of Internal Validity</i>	<i>1991-1997 (n) Malaysian Journals</i>	<i>1995-1997 (n) AERJ BERJ</i>	<i>Stability Index</i>
<i>Sampling Technique</i>			.81
Secondary Data	-	16.7 (5)	35.7 (5)
Randomization	12.5 (2)	43.3 (13)	28.6 (4)
Non-Probability	50.0 (8)	36.7 (11)	14.3 (2)
No Information	37.5 (6)	3.3 (1)	21.4 (3)
<i>Validity of Measures</i>			.93
Established	56.3 (9)	63.3 (19)	71.4 (10)
No Information	43.7 (7)	36.6 (11)	28.6 (4)
<i>Response/Mortality Rate</i>			1.0
Documented	18.7 (3)	53.3 (16)	28.6 (4)
No Information	81.3 (13)	46.7 (14)	71.4 (10)
<i>Estimates of Reliability</i>			1.0
Estimated	31.3 (5)	73.3 (22)	21.4 (3)
No Information	68.8 (11)	26.7 (8)	78.6 (11)
Response Rate: Mean	64.4	79.6	68.0
Lowest	52.0	45	43.0
Lowest Reliability	.42	.59	.62

Methodological Elements and Racial Background

To substantiate the argument that a researcher's conformity to methodological standards is associated with his value systems, descriptive analysis was applied on the data collected from the articles published in Malaysian educational journals. Table 4 shows the

percentage distribution of major statistical techniques used according to authors' racial background. While a big majority of the Muslim Malays (65%) used descriptive statistics, there was variability in the coverage of statistical applications among the non-Malays researchers. The data showed that among the non-Malay authors, 35.7% used descriptive statistics, 21.4% used ANOVA-based procedures and 7.1% applied data reduction scheme.

Table 4: Percentage Distribution of (Major) Statistical Techniques by Race (N=34)

<i>Statistical Technique</i>	<i>Malay</i> <i>n = 20</i>	<i>Non-Malay</i> <i>n = 14</i>
Descriptive	65.0	35.7
Correlation	5.0	14.3
<i>t</i> -test	5.0	7.1
ANOVA-based	15.0	21.4
Multiple Regression	5.0	-
Data Reduction -	7.1	
Non Parametric Analysis	5.0	7.1
Combination of Parametric & Non-Parametric Analysis	-	7.1

Table 5 summarizes the percentage distribution of Malaysian authors' adherence to the conventional standards. With the exception of sampling technique, conformity to methodological standards between the Malays and the non-Malays is somewhat comparable. The results of data analysis showed that none of the Muslim Malay authors used randomization in their study, despite the fact that they applied inferential tests as a means to generalize the results of their study. On the contrary, 22.2% of the non-Malay researchers indicated the use of randomization in their works. Be that as it may, it is also apparent that the Malay researchers failed perform better than did their non-Malay counterparts in conforming to the other aspects of methodological standards.

Table 5: Conformity to Standards According to Malaysian Authors' Race

<i>Elements of Internal Validity</i>	<i>Malay (n=7)</i>	<i>Non-Malay (n=9)</i>
Sampling Technique		
Randomization	-	22.3
Non Probability	57.1	44.4
No Information	42.9	33.3
Validity of the Measures		
Established	57.1	55.6
No Information	42.9	44.4
Response rate/Mortality Rate		
Documented	14.3	22.2
No Information	85.8	77.8
Estimates of Reliability		
Estimated	28.6	33.3
No Information	71.4	66.7

Obviously the results showed that the strict adherence to scholarly requirements as practiced in the Muslim tradition is not replicable in this modest effort. By and large, the Muslim educational researchers in Malaysia did not observe the demanding requirements of human sciences. One possible reason for this finding is that, unlike the scholarly works in Islamic studies, the standards set for methodological adequacy in education appear to be detached from religious values. The lack of attachment between Islamic values and research practices on educational phenomena might have substantially contributed to these results. The second possible reason is that the involvement of Malay Muslims in educational research is very much in its infancy. Perhaps, there is room for improvement with regard to the researchers' mastery of research skills and knowledge.

CONCLUSIONS

The results of this study have made some interesting observations about research techniques used in the published articles and the

standards for methodological variables accepted by journal editors. A major finding is that a majority of articles in the Malaysian educational journals and the AERJ used survey and correlational techniques. On the other hand, the qualitative method is the most frequently reported method in the BERJ. In the Malaysian journals, the qualitative methods ranked second to survey and correlational methods in terms of the frequency of being used.

Using a statistical-based scheme for classifying research techniques, the findings showed ANOVA-related procedures as the most frequently used statistical tests in the Malaysian educational journals. The finding is consistent with that of Elmore and Woehlke when they reviewed the 1978-1987 articles published in three APA journals.¹⁹ However, in recent years techniques related to multivariate analysis and modeling are becoming more prevalent in the prominent international journals.

In relation to methodological standards, the Malaysian educational journals accepted a large number of articles that neither applied randomization nor provided information about the psychometric properties of their instruments. Somewhat similar findings were reported in an earlier work on APA journals.²⁰ However, in the present study, the majority of articles in the AERJ reported the psychometric properties of their instruments. Besides the differences evident in the use of educational research techniques across the publications, the findings emphasize the existence of gaps between actual research practices as published in the professional journals and methodological ideals as taught in university courses. Obviously more questions can be raised pursuant to the results of the present effort. Therefore, it is imperative that greater concern be given to methodological issues, without which educational research would fail to effectively contribute to the process of knowledge construction.

Notes

1. L. Goodwin, & W.L. Goodwin, "Statistical Techniques in AERJ Articles, 1979-1983: The Preparation of Graduate Students to Read the Educational Research Literature," *Educational Researcher* 14 (1985)2:5-1
2. See for example, E.S. Edgington, "A New Tabulation of Statistical Procedures in APA Journals." *American Psychologist* 29 (1974): 25-26; P.B. Elmore, & P.L. Woehlke, "Statistical Methods Employed in American Educational Researcher and Review of Educational Research Journal from

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3. J.P. Shaver, & R.S. Norton, "Randomness and Replication in Ten Years of the American Educational Research Journal," *Educational Researcher* 9 (1980)1: 9-15.

4. D.E. Alvermann, D.W. Moore, (1991). "Secondary School Reading," In R. Barr, M.L. Kamil, P. Mosenthal, & P.D. Pearson (Eds.) *Handbook for Reading Research*, vol. 2 (White Plains, NY: Longman, 1991), 951-983; L.M. Lysynchuk, M. Pressley, H. d'Ailly, M. Smith, & H. Cake, H. (1989). "A Methodological Analysis of Experimental Studies of Comprehension Strategy Instruction," *Reading Research Quarterly* 24 (1989):458-470.

5. H. Walker, "Methods of Research," *Review of Educational Research* 26 (1956): 323-344.

6. See, Edgington, "A New Tabulation"; Elmore & Woehlke, "Research Methods"; and Goodwin & Goodwin, "Statistical Techniques."

7. Willson, "Research Techniques."

8. Elmore, & Woehlke, "Statistical Methods."

9. Elmore, & Woehlke, "Research Methods."

10. R.L. Venezky, "The History of Reading Research," In P.D. Pearson, R. Barr, M.L. Kamil, & P. Mosenthal (Eds.), *Handook of Reading Research*, vol 1 (White Plains, NY: Longman, 1984), 17.

11. D.T. Campbell, & J.C. Stanley, "Experimental and Quasi-experimental Designs for Research on Teaching," In N.L. Gage (Ed.), *Handbook of Research on Teaching* (Chicago: American Educational Research Association, 1963), 171-264.

12. Willson, "Research Techniques."

13. V.G. Ridgeway, P.J. Dunston, & G. Qian, "A Methodological Analysis of Teaching and Learning Strategy Research at the Secondary School Level," *Reading Research Quarterly* 28 (1993): 335-345.

14. Willson, "Research Techniques."

15. M.D. Bakar, "The Origins of Islamic Legal Theory (Usul al-Fiqh)," *Intellectual Discourse* 5, (1997): 121-144.

16. Goodwin & Goodwin, "Statistical Techniques."

17. Ibid.; Willson, "Research Techniques."

18. Elmore, & Woehlke, "Statistical Methods"; Elmore, & Woehlke, "Research Methods."
19. Elmore, & Woehlke, "Statistical Methods."
20. See for example, Willson, "Research Techniques."