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Content analysis of abstract of professional articles published in home and abroad

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Abstract
The main purpose of the study was to evaluate and compare published professional articles of home and abroad as well as to determine specific content areas where local articles need improvement. Literatures related to professional writing and content analysis were reviewed to develop a standard analytical tool. Thereafter, twelve local and twelve foreign agricultural journals were selected randomly. From each of these groups, 120 articles were chosen and these were analyzed adopting content analysis research technique. Adequacy of content of each component of professional articles was measured adopting 5-point measuring scale such as- rightly adequate, adequate, moderately adequate, poorly adequate, and inadequate.

The tool included ten attributes related to abstract of professional articles. Mean relative score of foreign (63.8) and local (58.5) journal articles indicated that overall quality of abstract of foreign journal articles found better than abstract of local journal articles. However, individual characters like 'thoroughness', 'brevity', 'length/pace' and 'independence/stay alone' quality of both foreign & local journal articles are more or less similar and computed mean value was found below four which indicate need for improvement. Moreover, majority of foreign journal articles (45%) poorly fulfilled 'methodology' whereas local journal articles (41.6%) poorly fulfilled 'concluding remarks' in abstract. On the contrary, 'use of reference/quotation' and 'mechanical faults was not found in any of the selected articles. Hence, authors and editors of local journals need to put more attention specially in writing *concluding remarks* of abstract *for* improving the quality of articles.

Keywords: Content Analysis, Professional Articles, Abstract.

1. Introduction

1.1 General background

Published literature of a discipline such as journal articles, trade publications, monographs, conference proceedings etc. present the knowledge base of a given discipline and reflect the discipline's history, trends, research norms, and social structures of communication among scholars. By analyzing published record of the discipline much can be learned about a discipline itself. Mittermeyer and Houser (1979) [21] argue that "the literature of a discipline is or becomes the discipline itself". Windsor and Windsor (1973) [29] said that "the knowledge bank of any field is its published literature". Similarly, Feehan (1984) [13] pointed out that "the subjects concerns of a discipline are nowhere better reflected than in its research literature". Like many other fields, most research in library and information science is published as journal literature.

Journals form the backbone of research activities. They provide a platform for the communication of ideas, the exchange of experience and the transmission of current information. Their regular and usually frequent publication ensures that material contained between their covers is almost invariably more up-to-date than that contained in book form (Anand, 1991) [5].

Evaluation of scientific articles, wherever it may be published, requires due attention particularly when the evaluation of professionals are done through publications. But, how to evaluate a professional article scientifically remains a big question. Some experts of selection and promotion committee simply see the number of published paper in national and international journals into ones account. The notion of national and international publication is highly questionable if the quality of concerned journal is not taken into account. Evaluation of professional articles must follow a standard procedure. It should follow scientific procedure so that it is valid, reliable and anyone from any country can do the job without much difficulty.

Evaluation of research communication is a common task of professionals in scientific community. Each member in a scientific community is required to communicate their research findings in written form. The professors and experts evaluate their students' term paper, thesis/dissertations, review scientific articles, and evaluate scientific and consultant reports. Hence, all parties concerned should possess crystal clear insights about the required contents of scientific communication. But, unfortunately our scientists are busy in their respective areas of research and seldom have they cared for the quality of their writing. Similarly, they can do little in evaluating scientific communication. The present research seeks to provide them an in-depth outline of writing/evaluation scientific communication, so that by following it a competent scientist can evaluate a scientific report more efficiently and precisely. This will indeed help to improve the standard of our scientific writing: thesis-dissertation, research reports, technical publications and the same.

1.2 Objectives of the study

The major focus of the study was to analyze the presentation style of published scientific articles by adopting qualitative content analysis technique so that the writers know the limiting factors of their writing if any, and experts know the standard characteristics and components of abstract in scientific article when they are assigned to evaluate it. The specific objectives of the study are to:

1. Develop a detailed checklist for evaluating abstract of professional articles and scientific reports;
2. Evaluate professional articles adopting the checklist to determine the extent of adequacy of information in abstract sections of individual professional articles
3. Compare articles of home and abroad and find out deficiencies in abstract of these articles in respect of fulfillment of standard requirements of presentation.

1.3 Review of literature

1.3.1 Content analysis

Content analysis of development communication (BS-farmer interaction in extension visit) has been carried out by Ali, (1993) [1]. He analyzed data on three variables related to communication- attitude towards, contact with, and feedback to information sources. For this, four categories of communication behavior were developed. The study has implications for categorizing farmers with homogenous communicative behavior, understanding their interaction patterns, identifying their information needs, and for training the extension workers to meet these needs. Such other works in communications include content analysis of journals, speech, songs, office documents, letters, books of disputed authorship, TV/radio news, war time propaganda etc. (Holsti, 1969) [15]. A study on analyses of the structure of abstracts was done that have appeared in the CABI database over a number of years, during which time the authorship of the abstracts changed from CABI editorial staff to journal article authors themselves. The study reports the semantic organization and thematic structure of 12 abstracts from the field of protozoology in an effort to discover whether these abstracts followed generally agreed abstracting guidelines. The method adopted was a move analysis of the text of the abstracts. Thematic analysis shows that scientific abstract authors thematise their subject by referring to the discourse domain or the "real" world. Not all of the abstracts succeeded in following the guideline advice. However, there was general consistency regarding semantic organization and thematic structure. (Cross and Oppenheim, 2006). Content analysis of journal and literature published from UK and USA was done by Walia and Kaur (2012) [28] with aimed to identify the types of research papers/articles, current trends in the choice of subjects, being included in the Library and information science (LIS) journal literature published from UK and USA. The study also aims to find out the impact of information and communication technology (ICT) on LIS subject fields. A content analysis of 165 research papers and journals articles published in the year 2008 in six LIS journals was conducted. Findings indicate that 93 (56.36%) of the articles out of the total 165 were research based. The variation is found with regard to coverage of core subject areas published from UK and USA.

Nour's study (1985) [23] examined the issues of forty-one selected core journals for 1980 to determine methodologies, subject classification, and she also analyzed references, end notes and bibliographies following each article. Feehan (1984) [13], analyzed the issues and trends in library and information science research published in 91 English language journal articles during 1984. They identified all substantive articles and then examined the random sample of those articles, classifying each article as either research or non-research. The characteristics that they investigated include the subject dispersion of research activities and the type of libraries on which the research centers. Harter and Hooten (1990) [14], in their analysis of information science publications, modified the classification scheme developed by Feehan. Some investigators conducted content analysis of issues published in one particular journal only. Such as, Cline (1982) [9], in her study analyzed the publications appeared in 'College and Research Libraries' from 1939 through 1979 (40 yrs). Verma (1995) [27], in her study entitled "Analysis of Contributions of ILA Bulletin" analyzed 87 contributions of four volumes of 'ILA Bulletin' from 1989-90 to 1992-93. Another study of similar nature was conducted by Razvi and Khan (1996) [24], in which they analyzed 108 contributions of five volumes of 'Herald of Library Science published from 1990-1994. Tigga *et al* (2005) [26], conducted content analysis of 33 issues of 'DESIDOC Bulletin of Information Technology' published during January 1997 to July 2002. Tedd (2006) [25] reports the analysis of the journal 'Program: Electronic Library and Information Systems' and its contents over its first 40 years. In addition to the above mentioned studies there are various scholars who used content analysis method for conducting studies which focused on particular geographic areas such as; Cooper (1987) [10] studied articles published in three leading library journals in Mainland China during 1985. Kajberg (1996) [18] conducted the content analysis of library and information science serial literature published in Denmark to determine the subject focus of the literature from 1957-1986 and Alemna **(**1996) [3] analyzed the contents of periodical literature of library and information science in Africa during 1990-1995. Dorner study (2001) [12] reports on a study of content of library and information science journals published in Australasia. The purpose of this study was to analyze how the content of the Australasian LIS journals affecting knowledge creation among LIS community of professionals, technicians, academicians and students of Australasia. Number of content analysis studies has also been conducted focusing on a particular specialty or subject area within LIS. Such as, Houser (1988) used content analysis for conceptual analysis of the first 15 volumes, 1974-1984, of Journal of the American Society for Information Science (JASIS) to discover the nature of information science, to examine the relationship between information science and library science and to determine if information science is a new branch of science. McKechnie and Pettigrew (2002) [22], and Jeong and Kim (2005) [17] conducted a content analysis of LIS articles published in LIS journals to examine the use of theory in LIS research. Allard (2005) [4] in the article entitled 'The Librarian's Role in Institutional Repositories: A Content Analysis of the Literature' identified areas that are being addressed in the institutional repository (IR) literature, and determine what the role of the librarian will be in IR projects, whereas Liu and Wan (2007) [20] analyzed the publication trends of scholarly journal articles on open access in the library and information science literature from 2000 to 2005.

1.3.2 Characters of abstract

According to Elsevier Science Inc (Anon, 1995) "an abstract should contain all the elements of the paper in a short form: there should be one to three sentences to introduce the reader to the subject, to describe the experimental design and methods, to describe the results and to discuss the results". An abstract in conjunction with title describes the objectives of the study, methodology in brief, significant findings and a conclusion or implication of the study in a definite proportion (Ali, 1995) [2]. Abstract is simply a summary of the work or paper that others can use as an overview. It will help the reader to understand the paper and will help people searching for a particular work to find it and decide whether it suits their purposes. The steps of writing abstract are as follows:

- Identify the purpose of the study
- Explain the problem at hand
- Explain the methods
- Describe the results
- Give the conclusion. (Annon, 2014)

Abstract should be constructed in such a way that if someone takes it out from the article that will not diminish the content and meaning of the article at all. The important characteristics of an abstract are as follows (Annon. 2008) [8]:

Completeness: This requires the components in it with the following proportion

- Objective or purpose of the study (10-20%)
- Materials and methods or methodology (10-20%)
- Principal results (two-thirds of the abstract or about (60-70%)
- Significant conclusion if any (10-20%)

Brevity or briefness: Should be 3% of the text of an article

Independence: Should stay alone (no link word or phrase)

For content analysis, completeness/thoroughness, brevity/briefness, length/pace, independence/stay alone, use of reference/ quotation, mechanical faults (use of formula, figure etc.), purpose/objectives of the study, brief methodology, principal results/ significant results and concluding remarks were identified as characters of abstract of technical report.

2. Methodology

The study was conducted at the Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur-1706, Bangladesh. Content analysis research method was adopted for the study. It is an exploratory research as the relationship between source and communication was not determined in the study. Only the characters of abstract sections of scientific articles were explored and compared between foreign journal articles and local journal articles. Every character (both quality characters and structural characters) was analyzed using a 5-point scale 'rightly fulfill', 'adequately fulfill', 'moderately fulfill', 'poorly fulfill' & 'not at all fulfill' with corresponding score of 5,4,3,2, &1 respectively. There are three distinct types or levels of units in content analysis: sampling units, recording units & context units (Krippendorff, 1980) [19]. In the present study 'agricultural related journal articles' are treated as sampling unit. Two hundred fourty published professional articles, 120 articles from local agricultural journals and another 120 articles from international agricultural journals were required as research material. In this study 'scientific journal article' was treated as unit of analysis. For making representation firstly, 12 agricultural local journals and 12 international journals were selected.

Table 1: Selected local and foreign journals

Selected Local Journals	Selected Foreign Journals
1. Annals of Bangladesh Agriculture 2. Bangladesh Journal of Agronomy 3. Bangladesh Horticulture 4. Bangladesh Journal of Agricultural Economics 5. Bangladesh Journal of Agricultural Research 6. Bangladesh Journal of Animal science 7. Bangladesh Journal of Botany 8. Bangladesh Journal of Entomology 9. Bangladesh Journal of Extension Education 10. Bangladesh Journal of Plant Breeding and Genetics 11. Bangladesh Journal of Plant Pathology 12. Bangladesh Journal of Soil Science	1. Plant and Soil 2. Agro forestry system 3. Biodiversity Conservation 4. Comparative Hematology International 5. Agriculture System 6. Indian Journal of Agronomy 7. Australian Journal of Agricultural Research 8. Australian Journal of Soil Research 9. Crop Science 10. Experimental Agriculture 11. Indian Journal of Extension Education 12. Journal of Agricultural Science

Then latest five issues of selected journals were taken. Lastly from each selected issue first and last article were selected as sample articles. In this way, 120 national and 120 international agriculture related journal articles were selected as sample for content analysis. Collected data were coded, compiled, tabulated and analyzed in accordance with the objectives of the study. Qualitative data were converted into quantitative form. The SPSS/PC+ and Micro Soft Excel were used for analyzing the data. Relative score of selected articles were computed using the following formula:

$$\text{Relative score} = \frac{\text{Achieved score}}{\text{Possible score}} \times 100$$

Statistics like frequency count as well as mean and percentages were used to describe each and every single character of components of selected articles. For testing whether there existed any differences between the quality of articles of national and international journal, paired t-test was used.

3. Results and Discussion

3.1 Attributes of Abstract of Professional Articles

Based on information presented in section 1.3.2, attributes of abstract of professional articles were identified and presented in Table 2.

Table 2: Selected attributes to evaluate abstract of professional articles

Section of professional article	Selected attributes
Abstract	1. Completeness/thoroughness
	2. Brevity/briefness
	3. Length/pace
	4. Independence/Stay alone
	5. Use of reference/quotation
	6. Mechanical faults (use of formula, figure etc.)
	7. Purpose/objectives (of the study)
	8. Methodology
	9. Principal results/significant findings
	10. Concluding remarks

As shown in Table 2, ten attributes related to abstract of a professional article. All these components wise attributes were fitted with a 5-points scale (rightly fulfilled, adequately fulfilled, moderately fulfilled, poorly fulfilled and not at all fulfilled).

3.2 Quality of Abstracts of Professional Articles

Recent development in the computer-aided literature search significantly increased the importance of abstracting the scientific information. It is the 'abstract' that in addition with the 'title' of an article reaches the research workers and academicians of widely varied background. Most researchers hardly get opportunity to read details of a scientific paper other than its abstract. However, the abstracts we write often do not meet user needs. Many of the abstracts are so poorly written that they are of little value. Therefore, in this paper the researcher wishes to cast light on the components of an abstract how it would ideally be, to highlight the deficiencies that often remain in an abstract, and to make some suggestions that hopefully will encourage writers to produce better abstracts faster and more efficiently. Here, the abstract characters like 'completeness', 'brevity', 'length/pace', 'stay alone', 'use of reference/ quotation' 'mechanical faults', 'purpose/objectives', 'brief methodology', 'principal results/significant findings' and 'concluding remarks' of professional articles were analyzed following content analysis technique.

Overall abstract character of majority (73%) foreign journal articles fulfilled rightly & adequately whereas in local journal article, majority (80%) of them fulfilled adequately & moderately (Figure 1).

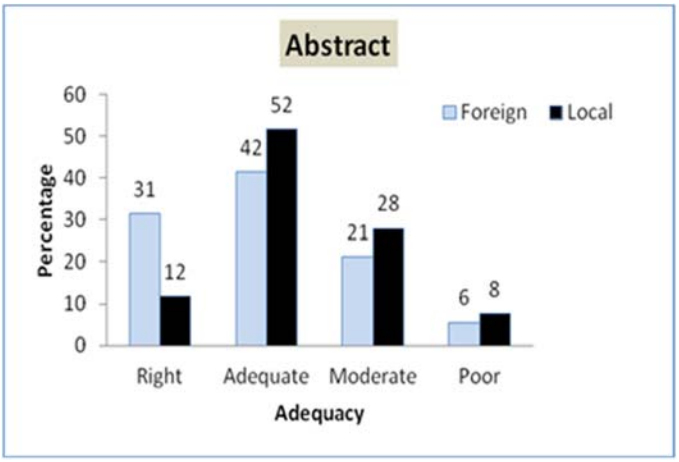

Fig 1: Comparison of foreign and local abstracts of published articles based on their adequacy of fulfillment of attributes

Computed mean value of abstract characters, like 'thoroughness', 'brevity', 'length/pace' and 'independence/stay alone' of both foreign & local journal articles were found below four (Table 5) out of five which indicate need for improvement. However, Table 3 distinctly indicated that, majority articles (45%) of foreign journal, poorly fulfilled 'methodology' in abstract and majority articles (41.6%) of local journal also poorly fulfilled 'concluding remarks' in abstract. 'Use of reference/quotation' and 'mechanical faults (use of formula, figure etc.)' were not found in any article of any journal.

Table 3: Distribution of selected articles based on their fulfillment of characters of abstracts

Characters	Fulfillment of Characters							
	Rightly		Adequately		Moderately		Poorly	
	F	L	F	L	F	L	F	L
	%	%	%	%	%	%	%	%
1. Completeness/thoroughness	1.7	-	53.3	48.3	45.0	51.7	-	-
2. Brevity/briefness	11.7	5.0	51.7	68.3	36.6	26.7	-	-
3. Length/pace	11.7	-	71.6	78.3	16.7	21.7	-	-
4. Independence/stay alone	11.7	11.7	43.3	33.3	45.0	55.0	-	-
5. Purpose/objectives of study	88.3	25.0	11.7	68.3	-	-	-	6.7
6. Methodology	11.7	13.3	16.7	50.1	26.6	23.3	45.0	13.3
7. Principal results/significant findings	76.7	31.7	23.3	45.0	-	23.3	-	-
8. Concluding remarks	38.3	6.7	61.7	21.7	-	30.0	-	41.6
Overall	31.0	12.0	42.0	52.0	21.0	28.0	6.0	8.0

F = foreign journal article, **L**= Local journal article

Table 4: Relative score of overall abstracts of selected journal articles

	Foreign Journal Article	Local Journal Article	t-valve	Sig. (2-tailed)
Range	56-76	46-72		
Mean	63.8	58.5	5.99	0.00**
SD	14.6	18.4		

****** indicates 1% level of significance

For further, clarification relative scores of abstract quality of each selected articles were computed and presented in Table 4. Mean weight of each character of abstract of foreign and local journal and their differences were computed and presented in Table 5. To test the significance of differences paired t-test was employed.

Table 5: Comparison of characters of the abstract of articles published in foreign and local journal

Characters	Mean		Mean difference	t-value	Sig. (2-tailed)
	Foreign	Local			
1. Completeness/thoroughness	3.57	3.48	0.08 (3.0)	1.16	0.25^{NS}
2. Brevity/briefness	3.75	3.78	-0.03 (0.8)	-0.47	0.64 ^{NS}
3. Length/pace	3.95	3.78	0.17 (4.5)	2.65	0.01*
4. Independence/Stay alone	3.67	3.57	0.10 (2-8)	1.10	0.28 ^{NS}
5. Purpose/objectives of study	4.88	4.12	0.77 (18.7)	10.99	0.00**
6. Methodology highlights in abstract	2.95	3.63	-0.68 (23.0)	-5.53	0.00**
7. Principal/significant findings	4.77	4.08	0.68 (16.6)	8.42	0.00**
8. Concluding remarks	4.38	2.80	1.58 (56.4)	13.34	0.00**
Overall	4.00	3.65	0.35 (9.59)	6.28	0.00**

*parenthesis indicates percentage

Mean relative score of abstract characters and their overall values of foreign journal articles significantly higher than that of local journal articles (Table 4, & Table 5) which indicated that overall quality of abstract of foreign journal articles found better than abstract of local journal articles. However, individual characters like, 'thoroughness', 'brevity/briefness', and 'independence/stay alone' quality of both foreign & local journal articles more or less similar as their respective mean differences were insignificance. Table 5 also revealed that, regarding 'concluding remarks' in abstract, mean value of foreign journal articles found significantly higher than that of local journal articles (percent mean difference 55.4) but for 'brief methodology' in abstract local journal articles found significantly higher than that of foreign journal articles (percent mean difference 23.0).

4. Conclusion

The important character of an abstract is completeness, that is, it contained objectives or purpose of the study, methodology, significant findings and concluding remarks in definite proportion. But majority authors of foreign journal did not take care about writing brief methodology in abstract and most authors of local journal missed concluding remarks in abstract.

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