Bridging the Interdisciplinary Gap in Abstract Writing for Scholarly Communication
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ABSTRACT

This paper reviews current research on the concept, quality and instructions on abstract writing issues in the disciplines of linguistics and information science. The purpose is to demonstrate their interdisciplinary relationship.

Research on the abstract genre in the areas of language and academic writing is first conducted and their major concerns identified. The study is followed by a discussion on the research by experts in the field of information science and their major concerns identified.

On the one hand, linguists are concerned that academic writers must abide by the rhetorical and linguistic conventions of their discourse communities and most research has been so far focused on whether or not abstracts produced in the real world actually reflect these conventions. On the other hand, information experts have been long been concerned with meeting the needs of information users and with the concern for producing and measuring abstracts that satisfy the quality expected in the area of abstracting and indexing. A comparison of research in these two disciplines exposes that there is indeed common ground between these two approaches.

The study concludes with the call for further research on abstract writing as an interdisciplinary interest between linguists and information experts.

Introduction

Scholarly communication involves transferring and exchanging information between the scholar-producer and information users, and the channel for this communication is called the information system. Learned societies that convene conferences, research articles publishers, the libraries that collect, organize, store and provide information via the electronic information carriers are fundamentally interrelated, co-dependent and collaboratively responsible for the “flow of information” (Hills, 1983). However, early studies in scholarly communication have found that such information flow has not always been smooth nor equitable (Lorenz, 1969) largely because of language barriers and distances. Later, the advent of advanced technologies in information transfer methods enabled by computerization added another problem. These developments resulted in a proliferation of information on the electronic information systems. Users are now faced with problems...
in not so much as having to filter in than to filter out the constant streams of information inundating their systems. In the attempt to resolve some of these problems nations agreed that they would undertake to scan and compile information under bibliographic descriptions and subject headings or index and store them in directories. At the same time, databases or collections of summarized texts called abstracts were organized and made accessible to information seekers via the information systems. Thus, it was during the 60s and 70s that the abstract first became a useful surrogate tool for quick and effective information retrieval.

In the 80s and 90s further technological advancements in high-speed computerization and the Internet facilitated even more widespread and expedient information transfer and retrieval. Information could now be stored in full texts in electronic forms for efficient retrieval, and free text searching became possible. Would these developments mean the death of abstract databases in the process of knowledge discovery? In their study, information professionals or experts, Pinto and Lancaster (1999), confirmed that abstracts are still useful summaries to human readers and explained how full texts often contain details that cloud efficient identification of significant and precise information intended by the author. Fidel (1986) stressed that in free text searching abstracts have become very important instead, because they are approximating the role of the index. Tenopir (1985) showed that reading abstracts is cost-effective but not less effective than reading the full text in knowledge discovery. Other information experts conducted studies concerned with establishing a set of criteria for abstract writing (Borko and Chapman, 1963) and with measuring the quality and claimed usefulness of abstracts. The status of the abstract has certainly risen because of current problems of information overload, rising costs of scholarly publications, and the continuing advances in information systems.

Parallel to this scenario, the language teachers have also been drawn into the process of scholarly communication. But for them, their focus is apparently different. Mainly, they have been landed with the pedagogical responsibility of instructing novice writers to scholarly communication, or in linguistic terms, academic writing. Language providers like these would remember that the 1960s saw the birth of ESP (English for Specific Purposes) which has survived till this day. The ESP teacher bases his pedagogical practice on the principle that language is for communication, and if non-native learners were to survive their specialized programmes in English they need to be socialized or initiated into their new discourse environments. One of the most significant theories influencing the pedagogical practices of ESP teachers of academic writing is the genre theory (Swales, 1991). By this theory it is believed that writers first learn about the explicit knowledge of a particular form of writing by following its specific structures, identifying the specific information elements required, and keeping to the specific language rules it applies consistently. These conventions or rhetoric characterize a particular genre, of which the abstract is an example, and distinguish it from other genres.

Thus, when teaching the abstract genre, ESP instructors like us are mainly concerned with teaching novice writers the correct content elements expected of an abstract and the prescribed structure and writing style associated with it. In this manner the students could model their own scholarly writing style to these norms. No doubt this approach fulfills the communicative objectives of our ESP curriculum but is this satisfactory? What about developing writers’ awareness to the purpose of their writing? How about user needs awareness? Are we well informed about how information systems both electronic and print perceive the abstract? What is the role of abstracts in information systems? Are there areas of commonality between the language and information science (IS) that could have pedagogical and research implications for the ESP teacher and vice versa? We may need to reexamine our role as the language provider of the genre and extend it to examining a larger role in information science. In this paper, research on the concept of the abstract, qualities that characterize effective abstracts and instructions on abstract writing in the ESP discipline would be discussed, and compared
with the information professionals’ interests. The results may enable ESP instructors to draw useful pedagogical insights from the IS discipline for improved pedagogical practices.

Table 1 summarizes the ESP and IS perspectives of the abstract genre. There are some major differences between the two disciplines under the categories of concept, research focus and production or pedagogical concerns.
Table 1: ESP and IS Perspectives about the Abstract

<table>
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<th>ESP Perspective</th>
<th>IS Perspective</th>
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<tr>
<td>Summary, preview, overview</td>
<td>Surrogate text for IR</td>
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Concept

The first difference is in the conception of the abstract genre by both disciplines. Language instructors have been paying attention to the meaning of abstract and abstracting from the position of the learner-writer. The abstract is the summary text to be written after the whole paper or study has been completed, and it is meant to give the reader an overview to the full text published in a journal. The abstract is also written as a promisory preview (Swales, 1990,) to conference convenors. As such the writer is often encouraged to make his abstract attractive or focused so that the intended reader selects it (Salbiah, 2000). On the other hand, information experts or professionals view the abstract as a global tool for more equitable scholarly communication. It is the surrogate that negotiates between the information seeker and the wealth of resources on the information systems. As such abstracts are perceived to be abbreviated representations of source documents. In this relation it is suggested that ESP instructors should also teach abstracts used for online information retrieval and pay more attention to meeting end-users’ needs.

In an ESP class the abstract is perceived as a rhetorical structure. It is genre specific, governed by a consistent set of information elements, organized in a specific structure, and expressed in a particular style. The cohesion of the abstract is maintained by a move structure. Specifically it follows a broad model of the research paper. It begins with the introduction, which includes the statement of purpose, followed by the main method used, then the most significant result, and ending with the conclusion or recommendation statement. In brief the abstract is another genre in academic writing. However, information service systems value the abstract as a documentary tool for efficient knowledge discovery. This abbreviated text contains compact information that is concisely and clearly expressed. As such it contains keywords that can be indexed to facilitate information search. As a documentary tool the abstract may be formatted with specific data such as the title, author, institution, date, documentary sources and keyword identifiers for information search systems. In the light of this it would be beneficial if ESP teachers also instruct learner-writers to select information that would function effectively as keywords and include these reference data in order to cater to information retrieval systems.

Moreover, information experts have validated in several studies that the abstract is a reliable and cost effective prediction tool in knowledge discovery. Despite the easy access to full texts, the surrogate is still regarded as very valuable for knowledge discovery, and despite the advent of machine generated
abstracts most information experts remain convinced that the human abstract cannot be replaced (Pinto and Lancaster, 1999). In view of this role ESP instructors would have the important role of training writers to write effective author abstracts for knowledge discovery.

**Research Focus**

The predominant research interest of ESP instructors of academic genres so far has been mainly revolved around the following questions. “How can novice writers learn to write acceptably for their discourse communities”? “What is the rhetoric of each type of academic writing”? “Do real world academic writings and workplace publications follow the conventions or guidelines set and prescribed by the numerous sources of such literature”? Swales (1991) had commented that the abstract genre has been neglected and should receive more attention especially in the instruction of second language writers of academic writing. It had been thought that the abstract being a very short text was not as challenging as the other academic genres. Others were of the opinion that being the last to be written after the whole paper the task would be a mere summarizing exercise. It is only in the 80s that more interest was generated in the abstract (Bazerman, 1984b; Graetz, 1985; Huckin, 1987, 1991). The main focus was on identifying the content and language conventions of the abstract genre for novice writers. Later in the 90s research interest diversified to real world practices.

In this paper, three recent studies on the abstract genre are discussed and compared with each other. These three studies represent the worlds of the medical experts writing for medical journals (Meyer, 1990), the corporate scientists and engineers (Koegh, 1994) working in a large corporation and writing reports for their in-house publications, and the academicians writing for linguistic journals (Santos, 1996). They based their data analyses on the prescriptions of textbooks, standards and guides similar to the literature used in the present study.

Meyers’ study resulted from frequent criticisms on badly written medical abstracts as being uninformative, misleading and lacking in internal structure. He was also concerned about the unmanageable size of the growing literature flooding researchers' arena and especially wanted to provide non-native writers with better models for writing in the real world. Meyer set out to determine the actual discourse structures of medical English abstracts. He conducted a move analysis on 77 Medical English abstracts and examined the selection and organization of moves of each abstract and analysed the pattern of paragraph structuring in order to assess the adequacy of its internal structure. The results of his analyses revealed that most of the abstracts were poorly structured. Many of them had no purpose statements, and no conclusion move. Moreover, there was a prevalence of illogical sequencing in their move organization. There were also flaws in the paragraph structuring and overlapping semantic concepts straddling between paragraphs. Meyer concluded that if novice writers were going to learn to write by following models in their reading then the models had better be good. To Meyer, abstract writing is serious business and should be given more significance and writers should be provided with useful instructions. Thus training in writing abstracts is essential.

Next, Keogh studied 48 abstracts written by scientists and engineers for their workplace publications and compared them to textbook advice. He wanted to identify the structural and stylistic features of a corpus of abstracts written by scientists and engineers. He compared them to model abstracts published in industry journals and conference proceedings by examining stylistic features like cohesive markers, conjunctions, pronoun references, abbreviations, parallel structures and telegraphic writing. His focus was on the differences between advice in published literature and the real world practice, and what accounted for these differences. He found that although textbook and guides distinguish between descriptive and informative type of abstracts, his sample findings did not reflect such differences.
Textbooks and guides recommend the use of active structures but his sample showed an almost even mix of active and passive sentences. While academic texts stress the importance of the conclusion and recommendation sections his sample seldom included these; but instead the scope was emphasized. He concluded that in the real world practice a lot of academic advice tend to be discarded especially when writers become highly proficient and experienced in the area of their writing responsibilities, or writers often follow the practice stipulated by the internal corporate culture.

Finally, Santos, examined how abstracts could be characterized in terms of their textual organization, and analysed other key features of this text. He selected 94 abstracts from three leading journals in the discipline of Applied Linguistics. He examined each abstract from both the macro and micro levels of the move analysis, submove analysis, and how they were presented linguistically and stylistically. He then matched each move analysis with the prescribed guidelines in textbooks. His findings had pedagogical advantages, and may be used for teaching novice or non-native academic writers in abstract writing by helping them in organization and raising their awareness of the genre structure.

The general consensus among all the three studies was that there are pedagogical advantages for teaching prescriptions of rhetorical and stylistic templates to novice writers with linguistic support, even though there may be deviations in the real world practice. It is apparent that research interest by ESP writers are still genre related and the objectives remain mainly pedagogical and linguistic.

On the other hand, a review of research by information science writers identified two major groups. The first group comprises the providers of advice and guidelines on abstracting and indexing, the writers of influential documents called standards like ANSI (1979) and ISO 214 (1976), and the gatekeepers who screen journal papers and conference abstracts. The second group includes investigators who set out to validate and evaluate the qualities of abstracts.

The significant status and functions of the abstract as surrogate in information systems resulted in a demand for abstracting services (Borko and Bernier, 1975). This development motivated professionals in information systems to prescribe advice and rules for writing abstracts that fulfill this surrogate role. The early writers on indexing and abstracting are Collison (1971), Borko and Bernier (1975), Rowley (1982), and Cleveland and Cleveland (1983). More recently, Lancaster (1991) summed up the characteristics of a good abstract as one that has brevity, accuracy and clarity, reflecting much the same opinion as the earlier writers do. Like the rest, Lancaster’s over riding criterion of an abstract is whether it serves the needs of the users.

Besides these books, information professionals have also institutionalized two highly influential standards to provide internationally accepted and recognized criteria for the production of abstracts for scholarly communications. They are American National Standard Institute commonly called ANSI Z39.14-1979, and International Standards ISO 214:1976. Both Standards comprise a type of controlled guide for the preparation and presentation of abstracts by authors of primary as well as secondary publications. They also inform about the main purpose of abstracts, and discuss the relevance and usefulness of the surrogate. A summary of the two standards that are adopted widely by most types of scholarly communication for abstract writing is in Table 2.

The third source of guidelines for abstract comprises conference organizers and journal editorial boards. Although these instructions are less comprehensive they nevertheless hold great clout as gatekeepers of scholarly communication.
Table 2: Standards for Abstracts and Abstract Writing

<table>
<thead>
<tr>
<th>STRUCTURE: Information conventions</th>
<th>PROCESS: Recommended rules for writing</th>
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<tbody>
<tr>
<td>➢ Background</td>
<td>➢ Begin with a topic sentence that is major thesis.</td>
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<tr>
<td>➢ Purpose: Objective and scope</td>
<td>➢ Write one paragraph abstract, more than one for long reports or theses.</td>
</tr>
<tr>
<td>➢ Methodology: Techniques or approaches</td>
<td>➢ Write in complete sentences,</td>
</tr>
<tr>
<td>➢ Results: findings concisely</td>
<td>➢ Use transition words for coherence.</td>
</tr>
<tr>
<td>➢ Conclusions: implications of results. Can be recommendations, evaluations, applications, suggestions, new relationships, and hypotheses accepted or rejected.</td>
<td>➢ Key words for indexing may follow</td>
</tr>
<tr>
<td>➢ Other information incidental findings to the main purpose of the document must not distract attention from main theme.</td>
<td>➢ Use verbs in active voice whenever possible.</td>
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<td></td>
<td>➢ Use the third person unless</td>
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<td></td>
<td>➢ Avoid unfamiliar terms, abbreviations or symbols, or define them first</td>
</tr>
<tr>
<td></td>
<td>➢ Include non-textual material only if necessary for brevity, and clarity</td>
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</table>

It is evident from the prolific literature that IS research is much concerned with the quality of abstracts and have made concerted efforts to regulate and control the content and production of this surrogate. The next part would discuss some of this interest.

Saracevic (1969) conducted a study on 22 users who submitted 99 questions to experimental IR systems. The users were to decide on the relevancy of these documents from 3 formats. The received first titles, then abstracts, and finally full texts. The results indicated that different representations of documents significantly affected the users’ relevance judgment. It seemed to be easier for the users to recognize non-relevance from shorter formats than relevance, and the judgment from abstracts was clearly preferred over the judgment from titles.

Other studies were conducted to assess the readability of the abstract using readability formulas, comprehension measures, or both. Investigators were Dronberger and Kowitz (1975) and Tenopir and Jacso (1993). Dronberger and Kowitz suggested that the measurement of the readability of abstracts could provide an assessment of one phase of an information system. They explored abstracts published in Research in Education (RIE), and whose full documents are stored by Educational Resources Information center (ERIC). The hypothesis was abstracts would be easier to read than source documents. The results of the study showed that the reading level of abstracts was significantly higher than the reading level of source documents because of its concise nature, its condensed information. However, it also showed that readability measurement does provide a useful technique for evaluating abstracts. Tenopir and Jacso (1993) conducted a study to measure the quality of abstracts by basing on style and readability, the extent to which the ANSI standard is observed, and the informativeness or exhaustivity of the abstract. They took three major CD-ROM general periodical indexes that contain abstracts. They used the Grammatik to analyze machine-readable texts. They found that the passive voice, prepositions, too many sentences per paragraph, too many words per sentence, and too many syllables per word all lowered readability. It was concluded that exhaustivity or extent of content coverage of source documents could not be so easily tested because of individual user needs, but objective global measures of quality are less problematic than subjective aspects of quality measurement. In more up-to-date studies, information professionals (Wheatley and Armstrong, 1996)
have been conducting several major studies on abstract production for online services, a direction to which the ESP researcher should shift.

Pinto and Lancaster (1999) based their study on judging the quality of abstracts in terms of exhaustivity, accuracy, readability, cohesion, brevity, and cost. They then matched these attributes of authored abstracts with computer-generated abstracts, and the human user was the basis for evaluation. They concluded that although the computer has enabled the wide availability of full texts in electronic forms this has not reduced the value of human produced abstracts in knowledge discovery for the following reasons.

It is apparent from these studies that content quality is undoubtedly the major focus in studies on assessing abstracts. Length or brevity concerns are secondary because it varies with nature of content, objectives of summarization, and requirements of editors or abstracting bodies. Cost is also usually not the concern of the author abstractor. But qualities like coverage or exhaustivity of source content, accuracy of representation, readability, organization and cohesion of the abstract are deemed highly relevant. The last three qualities of readability, organization and cohesion are linguistic issues too, and from this perspective language providers would have inherent common grounds for close collaboration with the information discipline.

**Pedagogical and Production Concerns**

So far, the paper has suggested that language experts or ESP teachers have been mainly concerned with teaching novice writers to produce linguistically and structurally acceptable abstracts for the discourse community of their specialist disciplines. These objectives have resulted in a concentration on teaching the rhetoric. They focused on teaching information organization, cohesive devices, and lexico-grammatical accuracy in writing. In practice abstract writing has been mainly a language exercise in summarization. It was with the development in genre analysis research and classroom practice in dealing with academic writing that more interest shifted towards investigating the real world practice. This is a progressive step towards bridging the gap between the classroom and user needs. However, the research has concentrated on examination of printed texts in traditional journals and in-house reports of the corporate world (Meyer, 1990; Keogh, 1994; Santos, 1996). It is perhaps timely that such progress should be extended to online information environments as well. Presently, the gap between the ESP classroom and the real world of electronic information systems has yet to be explored.

In contrast to ESP pedagogical focus, information experts have long identified consistent characteristics of effective abstracts and persuaded users on the benefits of writing the effective surrogate as well as rationalized for the seriousness of the abstracting business. To achieve this they have suggested professional training and application of strict processing rules. This would require abstractors to be knowledgeable in abstracting as well as be informed about the specialist subject under abstraction. Establishing common ground with this level of professionalism would suggest that ESP instructors also direct their learner-writers to not only treat the abstracting process as a summarizing and language based exercise, but also to adopt the attitude of wanting to approximate international standards. If authors can deliver better quality abstracts information systems could save a lot in terms of money, time as well as intellectual costs of abstracting for IR systems.

On the matter of writing the abstract, both ESP instructors and information experts are in agreement that the surrogate must be clear, concise, well-organized, cohesive, and self-contained representations of full texts. But ESP instructors have been teaching the communicative functions of abstracts from the genre and linguistic perspective. For example, Santos (1996) found a 5-moves model with submoves, and recommended that abstracts should include situating the research, presenting the
research, describing the method, summarizing the results, and discussing the results. Azirah (1996) in her dissertation stressed the Hallidayan treatment of analyzing the abstract and by implication suggested the functional approach to teaching the genre. There appears to be a need for more attention in training the cognitive strategies inherent in abstracting as perceived and practiced by the professional abstractors for information systems. For example, Pinto and Lancaster (1999) illustrated the cognitive process of writing an abstract modeled in Figure 1.

The figure illustrates how the abstracting process is a complex and demanding process requiring high level critical and analytical skills. Four levels of processing are identified. The abstractor first defines the goals of abstraction and follows writing guidelines obtained from various sources (indexing and abstracting books and standards). He proceeds to the next two steps in the abstracting process. In the "Interpretation or Selection process, the abstractor has to fully comprehend the original full text and selects the relevant and most salient information elements to include. The next step requires the abstractor to compose the abstract product, using his knowledge of the abstract structure, guidelines on writing abstracts, and linguistic proficiency. The last step 'Checking' is directly related to quality of the product. The author reviews his writing before submission, but this is dependent on his or her knowledge ability to do that, which in turn is influenced by linguistic and non-linguistic knowledge. The abstract may undergo editing and proofreading by the editors. The writing process is indeed, as Cremmins (1996) claimed a complex, critical thinking activity needing much cognitive processing, a pedagogy which interestingly the ESP instructors are best equipped teach.

<table>
<thead>
<tr>
<th>ABSTRACTING SYSTEM</th>
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<tr>
<td>DEFINITION OF GOALS (Pragmatic)</td>
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<tr>
<td>CONTENT INTERPRETATION/SELECTION (semantic)</td>
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<tr>
<td>CONTENT TRANSFORMATION (Lexical-syntactical)</td>
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<tr>
<td>CHECKING (Qualitative)</td>
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![Figure 1: Integrated Model of the abstracting Process](Source: Adapted from Pinto and Lancaster 1999:239)

**Bridging the Gap**

In summary the information professionals are mainly concerned with measuring the qualities of abstracts because of their concerns for user needs. Two of these qualities are closely related to the full documents. They are accuracy and exhaustivity of its representation of salient information in the original documents. It would benefit ESP instructors to cultivate greater awareness in this focus and view the abstract in its larger context of information search and retrieval. However, these two qualities
are difficult for ESP instructors to teach or verify because most writing is about specialist technical subjects, which are alien to the language experts. Except for alerting their learner-writers to maintain these qualities they have little control over them. Some ESP instructors have resolved this problem by consulting or collaborating with specialist informants (Evan, 1985; Bhatia, 1993), and it is probably the most effective solution although its practice is time consuming, complex and even unfeasible if there is no existing collaboration culture. Nevertheless, this step is recommended for training learners to write for information service provision.

The other quality of readability is easier to ensure, and it is this quality that is most within the control of the ESP instructors. To ensure readability the text has to be clear, well organized, comprehensible and yet brief. Language experts are most comfortable in this role. A major strength of ESP instructors is their expertise in training learner-writers to write concisely, make precise lexical word choices, structure clear simple and direct sentences to facilitate comprehensibility, organize information elements coherently and cohesively, and ultimately groom better author abstractors who can contribute meaningfully to the information systems. It is apparent where the strongest tie between information science and language teaching lies.

However, this bridge may only be built if ESP experts acknowledge their interdependency with the discipline of information science. If language experts are better informed about the abstract from the information professional’s perspective and are willing to establish common grounds with issues like the concept of the surrogate, useful implications for course design could be drawn to enhance their traditional teaching approaches. Involvement with specialist informants over the validation of learner-writers’ work would promote the much-desired interdisciplinary collaboration. Learner-writers, especially the non-native speakers of English would be the ultimate beneficiaries. They could be better equipped to create the desirable first impressions they need for the larger context of scholarly communication. Future work should include assessing the knowledge of novice ESL abstract writers, examine their process of writing, and explore collaborative relationships with subject specialists.

References


Pinto, Maria and F.W. Lancaster. (1999) Abstracts and Abstracting in Knowledge Discovery Library Trends Vol. 48 N0 1 Summer


