

研究生教学用书 / 专业核心课系列

A Bridge to  
Creditability and Authority

# 英语学术论文写作导读： 信度与权威

◎ 徐喜文 主编



华中科技大学出版社  
<http://www.hustp.com>

研究生教学用书 / 专业核心课系列

A Bridge to  
Creditability and Authority

# 英语学术论文写作导读： 信度与权威

◎ 主编 徐喜文

◎ 编者 徐喜文 都建颖 陈玉红 范杏丽 阚娜 兰素萍



华中科技大学出版社

<http://www.hustp.com>

中国·武汉

## 内 容 提 要

本书旨在为国内教育背景下的英语学术论文写作实践者提供针对性、实用性更强的指导。书中结合了英语学术写作实证研究的最新成果,提出了写作过程最需要解决的问题,包括如何理解高水平论文的信度标准,即对论文结构及语言表达传统背后所含的思辨能力要求;同时,通过贯穿本书的主线,介绍了提升论文权威性的有效方法:强化写作者对本专业顶级论文的思辨性阅读、“解析”专业顶级期刊的论文结构和语言表达传统规则、提升写作过程中观点阐述的有效性,即思辨技能应用能力。为了帮助阅读者掌握提升“思维方式”的每个环节,本书在每一章末尾都给出了相应的练习。

本书为正在准备写英语学术论文的研究生和博士生提供了一条新的技能培养思路,也可以作为研究工作者英语论文写作的参考用书。

### 图书在版编目(CIP)数据

英语学术论文写作导读:信度与权威/徐喜文 主编. —武汉:华中科技大学出版社,2011.10  
ISBN 978-7-5609-7385-2

I. 英… II. 徐… III. 英语-论文-写作-研究生-教学参考资料 IV. H315

中国版本图书馆 CIP 数据核字(2011)第 201196 号

英语学术论文写作导读:信度与权威

徐喜文 主编

策划编辑:刘 平(liup@hustp.com)

责任编辑:刘 平

封面设计:刘 卉

责任校对:何 欢

责任监印:周治超

出版发行:华中科技大学出版社(中国·武汉)

武昌喻家山 邮编:430074 电话:(027)87557437

录 排:华中科技大学惠友文印中心

印 刷:华中科技大学印刷厂

开 本:787mm×1092mm 1/16

印 张:10.5

字 数:248 千字

版 次:2011 年 10 月第 1 版第 1 次印刷

定 价:20.00 元



华中出版

本书若有印装质量问题,请向出版社营销中心调换  
全国免费服务热线:400-6679-118 竭诚为您服务  
版权所有 侵权必究

# Preface

## 前 言

Academic writing instruction has gone through a series of practices in both ESL and EFL contexts, including product and process approaches, genre approaches and latest process-genre approaches. However, the exploration in literature so far still remains argumentative in various reflections on instructional practice or unclear in conclusions of some empirical studies. The book *A Bridge to Creditability and Authority* is focused on a combined process-genre approach. The aim is to help learners develop a critical understanding of genres and conventions of academic writing, raise awareness of the practical skills in critical reading, skills in searching and assessing various research materials and sources, and competence in conveying a professional tone, including using the first person, various structures, active voice appropriately and other techniques to write with clarity, precision and concision.

Many scholars in EFL context are of no awareness of genres and processes in writing practice. They take academic paper writing as doing translation or imitation rather than a process of thinking transformation. Also, a variety of examination essay writing practices take deep root in their understanding of scholarly paper writing. Misunderstanding arises accordingly as a result of some strategy misuses, such as heavy reliance on set phrases, inappropriate use of passive voice and loss of writers' identity in the text.

The book is designed to familiarize scholars with the genres and conventions of academic writing, and the process of effectively structuring academic papers as well. Six chapters are involved, including Chapter One, Features and techniques of academic writing in English; Chapter Two, An access to disciplinary authority and its evaluation; Chapter Three, Voicing self, citation and plagiarism; Chapter Four, Conventions and construct of an academic paper; Chapter Five, Linguistic and grammatical issues; and Chapter Six, Reference, editing and submitting. Each chapter provides exercises for learners to get the main points of the chapter.

**Acknowledgements:** This book is based on a course pack used in a PhD program of HUST (Huazhong University of Science and Technology), supported by the school of Foreign Language Studies, HUST. The supports from the school leaders and efforts of the PhD program teaching staff ensure the publication of this book. In particular, we are grateful to Professor Fan Weiwei, and Associate Professor Fan Xingli, who have generously offered their help in the academic writing instructional practice of genre-process approach.

# Contents

## 目 录

<b>Chapter 1</b>	<b>Features and Techniques of Academic Writing in English</b>	(1)
1.1	Features of Academic Writing in English	(2)
1.2	Genre-Focused Approaches: to Base Writing on Reading	(6)
1.3	Some Frequently Used Skills in Academic Papers	(9)
<b>Chapter 2</b>	<b>An Access to Disciplinary Authority and Its Evaluation</b>	(18)
2.1	Definition and Classification of Academic Papers	(19)
2.2	Examination Criteria for a Paper's Academic Value	(20)
2.3	Disciplinary Differences	(25)
<b>Chapter 3</b>	<b>Voicing Yourself, Citation and Plagiarism</b>	(29)
3.1	Voicing Yourself; Some Techniques to Show the Writer's Identity	(30)
3.2	Building up Authority; Some Basic Methods to Cite Reference Materials	(43)
3.3	Plagiarism	(49)
<b>Chapter 4</b>	<b>Conventions and Construct of an Academic Paper</b>	(54)
4.1	Titles	(56)
4.2	Abstract	(58)
4.3	Introduction	(62)
4.4	Methodology: Materials and Methods	(66)
4.5	Results	(69)
4.6	Discussion	(71)
4.7	Conclusion	(73)
<b>Chapter 5</b>	<b>Linguistic and Grammatical Issues</b>	(84)
5.1	Dealing with data in tables or graphs	(85)
5.2	Frequently misused words	(88)
5.3	Articles	(91)
5.4	Effective sentence construct	(94)
<b>Chapter 6</b>	<b>Reference, Editing and Submitting</b>	(97)
6.1	Reference Styles	(98)
6.2	Editing	(116)
6.3	Submitting	(121)
<b>References</b>		(137)
<b>Supplement 1</b>	<b>ESI Field Definition</b>	(140)
<b>Supplement 2</b>	<b>Top Journals in 17 Typical Research Fields</b>	(149)



## Chapter 1

# Features and Techniques of Academic Writing in English

## 英语学术写作特点与技巧

Second language(L2) academic writing involves a multitude of non-native scholars' struggles in transforming of a way of thinking as well as heavy-burdened acquisitions of disciplinary vocabularies and rhetorical conventions. In response to the gap between the expectations of the Westernized academic community in which English is used as "Rosetta Stone of science" (Young, 2006) and the L2 scholars' perception of academic success, researchers, such as Horowitz(1986), Spack(1985), Reid(1986), Hyland(2003), and Johns(1997, 2002), discussed strengths and weaknesses of a series of L2 writing pedagogical approaches, contrasting the features between product and process approaches, process-centered and content-based approaches, and latest genre approaches and process-genre approaches. The pedagogical explorations addressed the developing process of L2 scholars' awareness of what an effective academic paper, or a good scholarly paper, should be. Among others, discussed in depth are the typical features of English academic writing and the contrasting characteristics between English and other languages (Chinese in particular for this book's readers—Chinese scholars).

In accordance with the purpose of this book to explore the application of process-genre approaches, this chapter will focus on the issues related to higher levels of Chinese scholars, the PhD candidates in particular, such as some aspects of L2 writers' awareness of the features of English academic writing, and L2 writers' familiarities with English academic writing skills.

## 1.1 Features of Academic Writing in English

Within the domain of effective academic writing, clear and concise presentation of writers' idea requires considerable language support. However, good writing styles and preferences, acceptable attitudes and beliefs towards argumentation skills, as many scholars in L2 writing have claimed, are frequently identified as hidden hurdles for L2 scholars to deal with in achieving their academic success. According to Matthews (2002), problems may develop when these students' concepts of "effective" writing clash with those of Western professors or colleagues. Their writings are frequently judged as "illogical", "lacking focus", "poorly organized", or "inadequately developed" because the rhetorical pattern does not meet the expectations of the Western academic community.

The cultural stances frequently set foot on instructions of academic writing in ESL contexts. Helen Fox (1994) in her book *Listening to the World: Cultural Issues in Academic Writing* has noted that cultural differences, learned from early childhood, affect the way the non-native students write, "for writing touches the heart of a student's identity, drawing its voice and strength and meaning from the way the student understands the world" (P vi). Some others, such as Matalene (1985) and Matthews (2002), suggested that in contrast with the post-Romantic Westerners who "subscribe to Aristotle's dictum" (Matalene, p790), L2 writers including Chinese scholars seem to follow some of the fundamental principles of the underlying rhetorical values in their culture (for example, in Chinese traditional culture, like Confucianism, Taoism and Buddhism), and seem to appeal to the history and to the tradition and to the authority of the past, and always rely on idioms, clichés, and set-phrases.

To illustrate how the difficulty L2 writers encounter arises, Matthews (2002) outlined the typical characteristics of effective academic writing in English in contrast with using other languages as follows.

Characteristics of Effective Academic Writing in English	Characteristics of Effective Writing in Other Languages
1. Language is viewed as a tool to transmit information, to accomplish a purpose.	Language is viewed as a tool for engaging the emotions through beautiful language.
	Language is used to create a social experience.
2. Language is viewed as a means for record keeping and documentation.	Language has a role as an art form and as a religious phenomenon; it is viewed as a conduct in which emotional resonance is stressed.

continued

Characteristics of Effective Academic Writing in English	Characteristics of Effective Writing in Other Languages
3. Focus on informational value of writing; therefore, factual accuracy is stressed.	Focus on aesthetic (poetic, artistic, emotional) value of writing; therefore, imagery, creative metaphors, analogies, and story-telling are used.
4. Information is expected to be specific, precise, accurate, and relevant.	Information is expected to be highly philosophical.
5. Preference for clear, direct communication patterns; messages are expected to be specific and detailed, avoiding ambiguity or uncertainty.	Preference for more indirect communication patterns, including ambiguous or circular messages.
6. Focus on clarity, simplicity, and getting to the point.	Focus on the richness and beauty of the language.
	Focus on the ability to repeat ideas in a variety of ways in order to keep the reader's attention.
	Use of digression: the writer links the point under discussion with other issues to show his/her wide range of knowledge.
7. Style issues focus on improving the clarity and accuracy of the writing.	Style issues focus on improving the emotional or aesthetic value of the writing.
8. One theme is favored.	Multiple themes are favored.
9. Because the backgrounds, experiences, and values of people in this heterogeneous culture are quite diverse, explicit background information and extensive elaboration are needed.	Because the backgrounds, experiences, and values of people in traditional, homogeneous cultures (such as Arab and Asian cultures) are shared, explicit background information and extensive elaboration are not generally needed.
10. Writers organize ideas hierarchically and often use subordination in their writing.	Writers organize their ideas through coordination and parallelism.
11. Stress on linear development—points are organized sequentially, with a beginning and an end.	Organization is not stressed; the broader picture may be presented without explaining or connecting details.
12. Direct, explicit statement of controlling at the beginning of a report, essay, research paper, etc.	No direct statement of main idea(s), with readers expected to infer the writer's point.
	Writers supply facts, examples, and support throughout the beginning and middle sections of the paper, with the controlling idea then being introduced in the last paragraph(s).



continued

Characteristics of Effective Academic Writing in English	Characteristics of Effective Writing in Other Languages
13. Explicit signals—such as transitions—are often necessary to show logical links between ideas; writers have the responsibility to make the connections clear.	Explicit signals are <u>not</u> necessary; writers show respect for the reader's intelligence to make inferences and to understand the links between ideas which are only suggested in the text.
14. The "burden of meaning" falls on the writer—referred to as "writer responsible".	The "burden of meaning" falls on the reader—referred to as "reader responsible".
15. Writers clearly link examples to generalizations.	Writers provide a series of concrete examples to make a point, but may not state the point or relate the examples to each other; the writer expects the reader to make inferential bridges among the statements—showing respect for the reader's knowledge, scholarship, and intelligence.
16. Heavy use of deductive reasoning (general to specific).	Heavy use of inductive reasoning (specific to general).
17. Arguments are supported by logical, analytical reasoning—requiring specific evidence such as facts, examples, statistics, etc.	Arguments are supported by intuitive reasoning—a single anecdote may constitute adequate evidence for a conclusion.
18. Focus on building arguments in a logical, step-by-step process.	Focus on building an emotional climax.
19. Emphasis on ability of writers to argue persuasively in favor of a particular point of view or take an informed stand on a controversial issue; questioning and challenging authority is accepted and encouraged.	Emphasis on ability of writers to present a balanced discussion of both sides of an issue without taking a strong, personal stand; respect for authority is encouraged.
20. Emphasis on the value of individuality and originality of ideas; writers want to receive credit for their own unique ideas.	Emphasis on the value of traditional wisdom and the knowledge shared by the culture. Reliance on memorization and manipulation of set phrases and textual forms to emphasize group values over individualistic goals.
21. The belief that individual authors own words and ideas, which requires writers/researchers to give credit to each author for his/her words and ideas.	The belief that educated, knowledgeable readers will recognize the source of the information; students learn to write by imitating the work of great writers, even including the exact words of the original author without citing the source.

While not all these features could be identified in Chinese scholars' L2 writing practice, some of the contrasts are quite typical in their academic writing. Look at the following two samples:

■ A: To compare with number of fibers, realistic systems require a large number of wavelengths; and therefore, to reduce crosstalk, very good filters are required.

■ B: In such a case, it leads to crosstalk and the reason is that the output of the wavelength converter depends on the total input power.

The two samples are grammatically right but they may cause readers to skim because of so many distractions and even dullness involved in them, as such reading burdens. In Sample A, two "themes" and two "purposes" are invited. It seems that the writer tries to achieve some kind of emotional climax and organize the idea through parallelism. Compare it with the published version(PV):

■ A(PV): Realistic systems require a large number of wavelengths compared with the number of fibers. Therefore, very good filters are required to reduce the crosstalk.

In Sample B, the writer seems to keep the readers' attention by means of showing the language's "richness" and the "circular massage". This may result from his poor writing style—wordiness and vagueness, thus may gain less appreciation of the whole writing. Compare it with the published version:

■ B(PV): This leads to crosstalk because the output of the wavelength converter depends on the total input power.

The fact that grammatical correction may not guarantee the acceptance among Western community arouses much anxiety among L2 writers. According to some scholars' explorations over Chinese L2 writers (such as Coffman, 2003; Cadman, 1997), Chinese L2 writers' puzzles and frustrations may result from some kind of transfer of Chinese rhetoric, and/or a lack of many essential elements in Western scholarship. Their dilemmas while pursuing "real" and "acceptable" English in science may be identified from the following questions.

***In terms of acceptability of rhetorical choices***

- ◆ How to achieve plainness, precision and objectivity while following the stereotype of writing in English as writers did in preparation for some L2 testing essays?
- ◆ May the writer's preferences for some single verbs, like "find" or "look into" instead of "identify" or "investigate", remind readers of an immature writer?

- ◆ To what extent should a writer invite “self (say I or we)” into text while constructing a voice of authority in the paper?
- ◆ Could a new writer follow the use of informal expressions as the professional writers and expert writers did in their papers?

### *In terms of selection of lexical items*

- ◆ How to acquire some appropriate words which make more sense in editor or reviewers’ stands, like the use of “questionable” instead of “wrong” when presenting arguments?
- ◆ Why are some terminologies preferable in some disciplines, like method vs methodology, while others are dynamic in different research areas?
- ◆ Does the ignorance of the nuance of some nominalizations, like discourse and language, acquisition and learning, cause any extent of bias among the reviewers?

### *In terms of syntactical construct*

- ◆ Does the pursuit of accuracy always demand use of long sentences? Or does complexity of sentence structure mean complicated ideas?
- ◆ Does high frequency use of passive voice always help build up high quality paper while enhancing the persuasiveness and achieving objectivity?
- ◆ Which is better in tense choice, the vivid, natural forms or the simple, timeless presentations?

Obviously, the answers to these questions can only stem from a sophisticated understanding of the characteristics of English academic writing. Although L2 writers have learned general English vocabulary and grammar even at advanced level, trying to publish in science using the English we were taught before is much like trying to unlock one door with the key to another (Young, 2006). As proposed by some scholars, the L2 writers’ familiarity with genre knowledge may help develop an understanding of English scholarly papers. In other words, genre-focused critical reading in the specific research disciplines may be helpful.

## **1.2 Genre-Focused Approaches: to Base Writing on Reading**

Following the reading checklist below in this section, you are about to learn what a scholar can acquire when developing academic writing style through reading the expert writers’ papers. First of all, the following three steps may help you find out which paper is worth your efforts:

- ◆ Step 1. To reflect on your own research interest and decide which topic can be your focus.
- ◆ Step 2. To consult the top international journals in your research area and select one of the latest issues which published original research papers.
- ◆ Step 3. To photocopy 2-3 articles on the topics you are interested in and/or luckily enough written by the VIP scholars in this research area.

Then, to focus on the article structure and organization of these papers, you may go through the following checklist and examine how well they are organized in this paper or in some unexpected cases whether it makes sense for some parts to be combined together:

- Title and authorship
- Abstract (Summary) and keywords (Index terms)
- Introduction
- Methodology (Materials and Methods)
- Results
- Discussion
- Conclusion
- Acknowledgement
- References

Following the above, you need further examine the “details” —a focus on elements of paragraph structure by checking through the features of good paper as follows:

- **Unity**—to check whether all the sentences within the paragraph relate to a central “theme” : the topic sentence presenting the writer’s main idea in this paragraph.
- **Coherence**—to check whether each sentence leads smoothly and logically to the next.
- **Development**—to check whether all sentences serve well to provide sufficient information for the main idea.
- **Conciseness**—to check whether all the words used in the sentences are not unnecessary.
- **Emphasis**—to check whether important ideas are stressed and what writing techniques are used, like repetition of words or punctuations.
- **Variation**—to check through the sentence patterns, including simple and complex sentences, short and long sentences.

After doing these readings, you may be skillful enough to re-examine the questions given in the previous section from three aspects: rhetoric, lexical and syntactical. The

suggestions given below may be worth your further reflection on the characteristics of English academic writing.

*In response to the acceptability of rhetorical choices*

- **Your Schemata for vocabulary and grammar:** your general English leaning experience may not guarantee your ability to think in an English way; otherwise it might hinder voicing your “self” in the voice of science.
- **Writing styles and preferences:** mature writers in science may pursue natural tone of plainness while standing at a neutral position and avoiding emotional or biased use of language.
- **The stances of first person “I or We”:** the appropriateness of the first person may vary in different disciplines. Articles in the humanities and social sciences may use more the first person than those in science and engineering.
- **Purpose and audience:** since the purpose of an academic article is to articulate the researchers’ original ideas within certain community and among the colleagues, most journals or periodicals prefer formal style. However, occasional uses of informal words, which will not cause exaggeration or inferiority, can also be found in some articles.

*In response to selection of lexical items*

- **Common wording principles:** pretentious wording preference may hurt or weaken the scholarly tone in any academic paper. The words like “utilize (use)” “prior to (before)” “commence (begin)” may distract reviewers from focusing on the original idea.
- **Suggestions of using terminology in practical style:** accuracy in academic writing demands high frequency of terminology use. The arguments should be present with the consistent use of the exact same terms, while variations inviting deeper understanding of the statements, such as cultural encounters or cultural experience in social studies, may help readers stay away from dullness. In any case of this use, your familiarity with the subject matter is crucial.
- **A bridge to nominalizations:** the ignorance of the nuances embedded in some interdisciplinary words, such as journals and periodicals, study and research, may confuse the reviewer to such extent that bias may arise. Also, standard abbreviation use, like ESL (English as a second language) or EFL (English as a foreign language), may help strengthen nominalization in academic papers.

***In response to syntactical construct***

- **The complexity and length of sentences**; original (new) and complex ideas in a paper require complex and long sentences. But some interval uses of simple or short sentences may facilitate reading and achieve better understanding.
- **The passive voice choice**; it is a wrong notion that passive voice use in academic papers may lay a favorable impression on the reviewers. Expert writers can always find an appropriate position facing with the controversial choices: to select active voice, which means to be subjective but directly get to the point, thus achieve clarity; or to select passive voice, which means to be objective and professional but may downplay the writer's responsibility and disturb the defined procedures of presentation. Compare the two groups of examples:

Group A: (1) We argue that ...

(2) The present study suggests that ...

(3) As the figure shows, ...

Group B: (1) It was identified that ...

(2) It has been argued that ...

(3) As has been shown in Table 1, ...

- **Preferable tense choice**; natural and vivid tense choice may give credit to the writer when doing documentation. On the other hand, timeless or simple tense use could empower the persuasiveness when introducing formula or results in an academic paper.

## **1.3 Some Frequently Used Skills in Academic Papers**

A well-organized research paper needs to be logical, unified and coherent. In the parts of Introduction and Discussion, paragraphing skills involve the techniques of opening a paragraph, of how to fully develop a thesis or argument and clearly state the findings of the study. Specifically, the techniques include:

- ◆ Definition vs. classification
- ◆ Exemplification vs. generalization
- ◆ Comparison vs. contrast
- ◆ Cause vs. effect

### **1. Definition vs. classification**

Any arguments need a clearly defined and further classified research scope or



context around which reviewers or colleagues may reach the understanding. Typically, the purpose, the central terms or concepts, and the formula or a theory all require to be defined before further discussed and extended. A definition ought to be elaborated in a condensed manner. It could be a completely stated sentence or sometimes a fully-constructed paragraph. Then hierarchically, an effective classification is followed. The principle to do this categorizing is that all categories should serve the purpose of the paper—what the writer wants to argue for this paper.

The following phrases are the most frequently used devices for the explicit definition and classification, though professional writers may not always turn to them:

◆ Definition

The definition of ... is ...  
... be referred to as ...  
... be defined/known as ...  
... is widely accepted as ...

◆ Classification

There are ... kinds/groups/categories/types of ..., including ...  
... be categorized/classified as ...  
... fall into ... (items/groups)  
... be divided into ...

Definition explains limits and specifies. By definition, the writer may capture the essence, set the boundary, and refine the characteristics or qualities of an idea or a concept. For example, the definition of “Letters” by *Nature* Letters goes as follows (From “Formats for *Nature* contributions”):

Letters are short reports of original research focused on an outstanding finding whose importance means that it will be of interest to scientists in other fields. They do not normally exceed 4 pages of *Nature*, and have no more than 30 references. They begin with a fully referenced paragraph, ideally of about 200 words, but certainly no more than 300 words, aimed at readers in other disciplines.

Classification, as a technique of grouping ideas, concepts, results, etc., according to their similarities and differences, can help establish classes of the subjects and distinguish the like subjects from the unlike ones so as to reveal and demonstrate the informational facts. In classification, some principles will consistently be applied to the subjects in order to keep the logical order. For example, the following classification is from “Guide for Authors” of *Journal of Process Control*:

(**Appendices**): If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A. 1), Eq. (A. 2), etc.; in a subsequent appendix, Eq. (B. 1) and so on. *Similarly* for tables and figures: Table A. 1; Fig. A. 1, etc.

In some cases, the classification goes before the definition of the subject. See the introduction from the journal *Mechanical System and Signal Processing* (MSSP) (from the "Guide for Authors" of MSSP):

**On-going developments** in Mechanical, Aeronautical and Civil Engineering and major changes brought about by advances in instrumentation and associated computing power, necessitate the application and integration of techniques *involving* system theory, signal processing, control theory and statistics. . . . ; MSSP **strives to** publish refereed papers of the highest quality reflecting the activities and interests of workers in academic and industrial and development establishments. It *provides* a forum for the discussion of research finding related to applications utilizing these disciplines, while maintaining a healthy balance between fundamental and experimental topics.

## 2. Exemplification vs. generalization

General statements are frequently used for interpretation of the facts or ideas that support directly or indirectly the arguments. Generalization as a statement writing technique can be found in almost every part of a paper. It is usually followed by examples. Thus, exemplification is frequently used by providing facts, evidence, or data. The following phrases are frequently used devices for generalization and exemplification:

generally, in general, on the whole, particularly, especially, in many cases, in particular, take(consider) . . . as an example, as follows, as an example, such( . . . ) as, for example, for instance.

The different formats to present generalization and exemplification can be seen from the following samples (The generalization parts are italicized).

*Presenting by time sequence and change in tendency*

*The use of optical links for the transmission of RF (analog) signals has continued to expand for more than 15 years. Perhaps the first widespread commercial application of analog optical links was the distribution of **cable television (CATV) signals**. Although perhaps not as large in dollar sales, **antenna remoting** has been an important application in both commercial and military markets. More recently, **RF-over-fiber** has been a growing application area for analog optical links.*

*Presenting by direct indication devices*

Initially naive "link design" merely consisted of connecting the optical output of a diode laser to the input of a photodiode. However, *the RF performance of such links was often modest at best, and terrible at worst; typically one* would obtain from such a "design" a link loss of 40 dB and an NF of 50 dB, which severely limited the applications of such links.

*To address these shortcomings there has grown up over the last 15 years or so the field of link design, which is closely related to, but distinct from, device design. A dramatic early example* of the power of link design was the work of Cox *et al.*, who were able to achieve RF gain from link components that otherwise would have resulted in substantial link loss.

There have been at least two other outgrowths of link design. *One outgrowth has been to highlight which device parameters will have an impact on link parameters and to quantify that impact. For example,* reductions in the threshold current of a diode laser have no impact on link gain, whereas increases in slope efficiency have a major impact. Another outgrowth of link design has been the ability to establish the limits on link performance. Such limits have proven useful in providing a "calibration" on the progress in link performance that has been made relative to the ultimate progress that at least theoretically should be achievable.

*Presenting by detailing*

*During the last decades, attempts have been made to enhance X-rays yield from plasma focus by adjusting different parameters **such as** capacitor energy, operating voltage, circuit inductance, nature and pressure of working gases, material and shape of electrodes, proper election of anode length and insulator, pre-ionization before initial discharge in addition to normal operating conditions.*