

A Model for Assessing Compliance of Scientific Journals with International Standards

EMILIO DELGADO LÓPEZ-CÓZAR AND RAFAEL RUIZ PÉREZ

A method for the evaluation of the degree of compliance of scientific journals with international standards for the presentation of periodicals is proposed. The aim of this study was to enhance the quality of information in these media of scientific communication, and to improve the standards issued by standardization institutes. The limitations, possible uses, and applications of these standards are noted. Furthermore, the criteria used for the selection of standards to be evaluated are described, together with criteria for inclusion in the sample.

The result is a checklist comprising 129 items, each of which can be scored as present/absent, correctly or incorrectly presented, and correctly or incorrectly located. To facilitate the evaluation, the items are grouped into sections, divisions and blocks on the basis of logical, physical or content similarities. These divisions reflect the distribution of responsibility between the editor and the contributor in complying with different standards, and illustrate a more logical reorganization of the elements regulated by the standards.

Introduction

Journals as an instrument of scientific communication

Based on a working hypothesis that standardization has a greater influence on the success of scientific communication than has been appreciated thus far, we predict that inadequate or incomplete compliance with publication standards diminishes the effectiveness of international journals as agents of communication and debate among different scientific communities. The purpose of this article is to describe a procedure we developed to evaluate the degree of compliance by periodicals

with publication standards, and to propose some applications of our procedure.

Before continuing, we would like to clarify the confines of our evaluation. Because scientific journals are products of the publishing industry, and thus subject to market forces, an analysis of compliance with standards provides no information on the quality of the science they report, and should not be used to rank or otherwise classify publications. A separate study designed to determine the correlation between compliance with standards and international indicators of the journal's value as a communicator of "good" science would no doubt shed light on this relationship. (We suspect that the two measures are indeed re-

lated.) However, this relationship cannot be deduced empirically, and no association can be assumed between standardization and scientific quality of the texts. It should be kept in mind that standards do not affect the content of a periodical *per se*, but rather improve the presentation and transferability of the publication's contents.

Standardization affects a journal as both a support medium and a collection of information, although the influence of standards on each element is different. As a medium, the journal can be considered both a document object (e.g. cover, paper, physical materials, etc.) and a document content (e.g. logical structure such as that embodied by the IMRAD format (Introduction, Methods, Results and Discussion, and physical structure as embodied in the typographical layout). The higher the quality of these characteristics (i.e. the greater the compliance with pertinent standards), the better the journal will serve its purpose as an organ of information transfer (dissemination, management, storage, retrieval, diffusion and ease of assimilability). This is the only sense in which the quality of the journal can be said to be affected by the degree of compliance with standards; the quality of the contents (e.g. the cognitive, methodological or linguistic characteristics of the articles published therein) are in no way influenced by standardization, despite claims to the contrary. As noted by Ferreiro and Jiménez (1), the two aspects are entirely unrelated.

Since the nineteenth century, journals have undoubtedly constituted the principal medium of scientific communication. Despite their excessive number, limited readership, high production costs, low profitability, and time required for publication (to mention just some of their drawbacks), they continue to be a fundamental instrument of scientific progress. Successful completion of the cycle of information transfer depends to a large extent on the characteristics of journals. Moreover, the public prestige of the scientific community represented by a particular journal (or group of journals) is conditioned by the dissemination and reputation of the contributions its members publish. These reasons make scientific journals and their role in the communication cycle worthy of investigation; their success in this role is strongly influenced by their degree of standardization.

Standardization as an agent of scientific information transfer

Standardization of publications plays an increasingly active role in the processes of integration and exchange of scientific and technical information. The globalization of science, together with the need for scientists from different backgrounds to work together, make standardization essential for continued progress. Differences in geographical, linguistic, institutional and personal settings in which scientists work create barriers that may curtail the efficacy of media based on written communication; standardization provides a tool that makes it possible to overcome these barriers.

French (2), Côté (3), and others have already noted that standardization saves work in the course of information processing, and removes obstacles to information transfer. Standardization benefits everyone involved in the process of information transfer (i.e. authors, editors, information managers and information users), whose relationships with and expectations from scientific and technical publishing have been described by Line (4). It facilitates the job of members of both the primary communication circuit – who are responsible for the intellectual and physical creation of scientific publications – and the secondary circuit – i.e. those who transform, adapt, store and retrieve information to make it more accessible to other users.

Although its influence is indirect, standardization also affects the evaluation of science indicators insofar as it conditions the basic premises that need to be assumed to make appropriate use of current bibliometric indicators (5). Because they act as sources of information used to assess scientific output – defined variously in terms of efficiency, productivity, profitability, development, impact, and interrelation with other scientific disciplines – journals can, by following appropriate publication standards, expedite the subsequent tasks of identification, selection, extraction and processing of data, and can thus enhance the reliability of such evaluations.

Standardization also serves as a filter for the incorporation of journals to data bases (6). Those periodicals that do not fulfil the requirements of these information systems – which include compliance with international standards for the presentation of scientific publications – are unlikely to be selected for inclusion, and thus miss an op-

portunity to broaden their usership through international circuits. This is an important point, because data bases have not only become essential intermediaries between scientists and the information they need to obtain but, more significantly, they have come to be considered indispensable tools in bibliometric analyses aimed at evaluating scientific production.

Standardization studies

Few studies have investigated the degree of compliance by journals with publication standards; reports published to date have been limited in scope to a single field of knowledge (7) or geographical area (8). At least in Spanish studies (9), standardization has usually been treated as one more item within a system used to evaluate scientific journals. The deficiencies in the procedures used by the workers cited above jeopardize the validity of their findings. Space limitations prevent us from giving a detailed analysis of these methodological shortcomings; instead, the paragraphs below provide a brief overview of their major weaknesses.

1. The items being evaluated were usually not specified. The "degree of compliance with ISO 8:77 and ISO 18:81" cannot be assessed in general terms, as was attempted in one study (8). More surprisingly, a recent article attempted a similarly general evaluation of compliance with UNE 50-101:88 (10), which comprises an extensive series of dozens of discrete rules of markedly different content. If the characteristics under evaluation are not specified, it is almost impossible to reliably assess compliance with the rules as simply present or absent.

The problems with selecting specific parameters for evaluation are exemplified by the studies of Kövendi (7) (30 items) and Dalva Martins (7) (21 items). These authors attempted to study complex standards such as those pertaining to the front cover, text pages, cumulated contents list, or bibliographical strip, each of which comprises a number of items. Consequently, the authors needed to resort to values that reflected some intermediate point between yes and no; e.g. "partially" or "essentially". In less detailed studies such as those published by the ICYT (9) and by Ortega and Plaza (10), no attempt was made to define or use intermediate values; moreover, the results were compiled in an arbitrary, subjective manner. In

contrast, when specific rules to be evaluated are precisely defined beforehand, compliance is much easier to evaluate objectively.

The methodological defects of previous studies have two main consequences. Firstly, the evaluation cannot be considered objective, as each evaluator had some latitude to judge the degree of compliance on the basis of his or her particular (hence variable) knowledge of the requirements set down by each standard. Secondly, the data thus collected cannot be compared with the results of other studies.

2. Previous studies did not specify the criteria to be used by evaluators in scoring compliance as present or absent. A detailed explanation of the criteria for considering each standard as satisfactorily fulfilled is essential to enable subsequent researchers to attempt to duplicate the findings. Compliance of publications standards by periodicals varies greatly, with many shades of intermediate compliance. In view of this variability, a clear, detailed statement of the criteria for judging compliance and noncompliance must be provided.

3. Some studies have compared compliance with recommendations published by different organizations such as ISO, UNESCO and ICSU. Such comparisons are inappropriate, as different sets of standards, despite their similarities in content, do not enjoy the same authority or degree of diffusion among those involved in journal production. As a result, the degree of implementation varies between different sets of recommendations.

4. Prescriptive standards were not clearly distinguished from recommendations considered optional, and from those meant only to reflect contemporary trends. This is not to suggest that the two last types should be ignored; however, compliance with these recommendations is much more difficult to assess and quantify objectively, and requires a different approach to that used to assess prescriptive standards.

5. Most studies published to date did not examine features that should be considered essential elements of a suitably standardized periodical. For example, the standards that provide guidelines regarding volumes were rarely considered, most studies concentrating on the standardization of separate issues within a given volume or period covered by a volume. This omission limits the usefulness of these studies, as they provided no information on standards that can only be evaluated if at least two consecutive volumes are examined.

We could cite further methodological defects in studies published to date, although the examples given above should make it clear that the flawed methods of data collection make their quantitative findings unreliable, especially as a basis for scoring, ranking, or otherwise classifying periodicals. The accurate recording of compliance with the help of a standard form such as the one we have developed can help to ensure that data obtained in different series of analyses are comparable.

Proposed method

The specific goals and limitations of the method we propose below for the evaluation of scientific journals need to be stated, to ensure that other users are aware of the type of information they can expect to obtain if they implement the procedure appropriately. With these caveats, we hope to avoid the limitations of earlier studies.

Objectives

The major purposes of our method are to quantify the degree of compliance with international standards concerning the presentation of periodical publications, to identify standards that are most commonly ignored, and to identify the agents responsible for failure to comply with standards. These data should be useful in attempts to discover the degree to which key factors in the information transfer cycle are affected by noncompliance, and to identify the causes of noncompliance as a first step toward correction. Our method has two main goals:

- To improve the degree of standardization of scientific journals, as a means of enhancing journals as instruments of communication. Studies of standardization practices should be able to identify lapses in compliance, and thus help publishers and editors to correct these deficiencies.
- To improve the standards for the presentation of scientific journals. The conclusions drawn from the present study can be considered recommendations that might help institutions and organizations involved in standardization to add, revise or withdraw standards.

Targets of evaluation: standards and journals

The first question we were faced with was whether to limit our study to "official" standards published by the International Standards Organization (ISO), or whether to also examine compliance with the recommendations of other organizations such as UNESCO, scientific societies and professional associations connected with scientific publishing. We chose the second option (see Appendix 1), as we anticipated that the results of a wider-ranging study would be applicable to a greater number of circumstances.

Restricting our evaluation to "official" standards would have reduced the amount of information obtainable regarding a journal's effectiveness as an organ of scientific information transfer. Actual publishing practices, which are constantly changing and evolving, frequently fall outside the territory delimited by standards. Unfortunately, a look at the publication and revision dates of some standards (none of which remains in effect for less than five years) shows that the institutes responsible for the development of standards work slowly, and their mechanisms for the creation and modification of standards are too rigid to keep up with the need for new guidelines. The rapid development of new publication technologies makes new standards necessary, and emphasizes the obsolescence of many of the current guidelines. (One example of this situation is the set of items proposed for improving the abstract sheet. See below and division IX on the data sheet.)

Because we decided to examine such a wide range of standards, the requirements set forth in each one by different entities and authorities have been painstakingly described in this report. Therefore, each item analyzed is based on a specific standard, which is indicated on the data collection sheet (see *evaluation parameters*). This makes it possible to obtain separate data on compliance with "official" and "unofficial" standards.

The next decision was whether to examine national (i.e. Spanish) or international standards. The evaluation procedure we propose was designed, in principle, to be universally applicable, given the increasingly international nature of scientific inquiry. Because international (ISO) standards are widely disseminated, we assumed that this would obviate marked geographical differences in the implementation of publication stan-

dards. Moreover, there are no substantial differences between countries in the acceptance and implementation of these standards. National standards often closely resemble, and indeed are often translations of, the standards published by international organizations. There are nonetheless peculiarities, usually related with linguistic usage, that need to be considered. When periodicals from a given country are to be analyzed, the reference standards should be both international and national. The analysis can thus be international in scope (as when journals on a specific specialty are examined), or national (when journals from a certain country or specialty within a country are examined).

In planning the present research, we also had to decide whether or not to limit our study to preceptive standards. Because all published standards distinguish between preceptive and optional elements, compliance with the latter by journal editors and publishers might differ significantly from compliance with mandatory (preceptive) elements. However, if the distinction between the two is not taken into account, the conclusions regarding the degree of compliance may be misadvised. We opted to include all items, regardless of their degree of compulsoriness, as compliance with most of them would enhance the transferability of information. The degree of compulsoriness was clearly indicated for each element analyzed. (See *Evaluation parameters* below.)

A final consideration concerned the appropriate sampling of the periodicals we evaluated. The detailed structure of the data sheet we developed to record compliance made several types of analysis possible. Obviously, it is not necessary to examine every issue of a given journal to obtain representative data. Nonetheless, to evaluate the most important features of a journal in terms of the transferability of the information it contains (e.g. presentation of the journal and its contents, and specification of the volume and issue number) the sample had to include at least one complete volume, which usually (but not necessarily) covered a complete calendar year. The ideal sample comprised two complete, consecutive volumes, which provided information on elements that might have changed from one volume to the next.

If desired, a single issue of a journal can be evaluated, on the understanding that the assessment will provide no information about general features of

the journal, characteristics of each volume, or consistency of compliance from issue to issue. Because of these limitations, we advise against examination of a single issue chosen at random, as it is unlikely to be a representative sample of the journal. Unless the objective is to analyze compliance at a given moment in time, the data provided by a single issue will be of limited use.

The data sheet

The data sheet (see Appendix 2) is the main tool we developed to obtain information on compliance with standards by scientific journals. In accordance with the critique of methods used in earlier studies, and our suggestions for improvement, we have attempted to produce an instrument that supplies accurate, objective, comparable, quantitative data. In the sections below we describe the general features, structure, and items into which the data sheet is divided.

General structure of the data sheet

The standards included in our data sheet are organized on several different levels. The first page of the sheet identifies the periodical examined. The first main section of items on standardization *per se* deals with presentation of the journal (p. 2 of the data sheet; hereafter DS p. 2); the second main section deals with presentation of the contributions (DS p. 5). These sections were used for the reasons given below:

1. We believed it necessary to establish responsibility for compliance with each standard among those involved in journal publishing (i.e. authors, editors and publishers), and to identify who was responsible for each incident of noncompliance. Evidently, the journal's editor and editorial advisory board (as reflected in the journal) are ultimately responsible for rejecting contributions that do not comply with the required standards, and this body can thus be considered responsible for compliance in published issues of the journal. However, authors should not be exempt from responsibility for complying with certain standards.

2. The second reason is related to the documentary nature of journals. In bibliographical terms, a journal is composed of two units of information of clearly different content: the journal itself, and the

contributions it contains. Each of these units can be the object of a request for retrieval, and each comprises a separate bibliographical unit, i.e. a document or part thereof that can be identified by a bibliographic reference. The contributions (i.e. individual articles in a journal) are the smaller units, and are included within the larger unit (e.g. an issue of a journal); both can be identified with an analytical entry (11).

The second level of organization used to design the data sheet distinguishes between standards that apply to general aspects (e.g. periodicity and format), volumes (both on DS p. 2), and issues (DS p. 3). The groups of items on volume and issue standards are self-explanatory: these divisions reflect the physical and bibliographic units into which a journal is organized. The groups of items concerning volume and issue, together with the main section devoted to items on individual contributions, constitute, in order of decreasing "bibliographic" level, the units of information that can be analyzed separately with the method we propose.

The third level of organization consists of divisions (designated with roman numerals), some of which are grouped together in blocks (headed in bold print). (See for example division II, Pagination and first page of cover, DS p. 2, and the blocks headed General items, Heading for table of contents of volume, and Individual contributions, DS p. 2.) A division includes standards referring to single characteristics, or to features of the document that are closely related logically, physically, or in content. Logical similarity has to do with the structure of the information in the text, e.g. the use of chapters, sections, abstracts, or notes. Within each document, each of these logical content units transmits a specific type of information, and has a specific appearance and location. (See for example division III and division IV, DS p. 2.)

Physical similarity between elements of information was another consideration we used to group standards. Some standards specify that a particular item appear in a certain place in the document, e.g. on a numbered page, or in some part of a page (e.g. in the running head or running foot). (See for example division II on DS p. 2, and division V on DS p. 3.)

Items were also grouped within a single division or block when they were derived from the same standard. For example, we considered it logical to group together the standards concerning in-

formation about the journal and its publisher, or the information for authors. (See for example division VI on DS p. 3.)

We believe the way in which the standards are grouped in the data sheet, and the order in which the different sections, divisions and blocks are to be completed, represents one of the major advantages of our instrument. We hoped to produce a system for analyzing a very extensive collection of standards, which are spread across different sources and grouped under general and specific headings. In some cases, the standards as published did not reflect the characteristics we intended to evaluate; in other cases, the standard combined features that we wanted to examine separately; or did not differentiate clearly between characteristics we felt should be analyzed individually. Consequently, our aims were twofold:

- 1) to specify items in detail, and
- 2) to propose a more logical reorganization of the features the standards are intended to systematize.

Evaluation parameters

The data items, numbered 1 to 129 on the data sheet, are the most important analytical element in the method we propose for the evaluation of compliance with standards by scientific journals. The basic assumption that underlies the development of these parameters is that a rigorous, detailed analysis of separate standards or elements of standards will provide objective information on compliance. The errors of earlier studies, and the results of our research on standardization, suggested that the parameters of evaluation needed to fulfil two essential conditions:

- To determine whether a specific guideline is followed or neglected, each individual requirement reflected in a given standard needs to be identified as a separate parameter.
- To ensure that our method is based on firm scientific grounds and produces objective data, each parameter needs to be precisely stated in univocal terms, to avoid confusion and overlap, and to enable the user to decide without hesitation whether the condition is fulfilled or not. In other words, each item on the data sheet needs to be phrased in such a way as to prevent subjective responses.

Nevertheless, we found that these two conditions were insufficient. It was sometimes difficult to categorize compliance as an all or nothing phenomenon, and in some cases, some of the specifications of a given standard might be fulfilled while others were neglected. As an example of how complex the situation can be, consider the specifications regarding the abbreviated title of the journal. Not only should the abbreviated title be present, but it should also be abbreviated in accordance with the relevant standard for serial title words; in addition, it should be located correctly. If only one or two of these conditions are met, how should a user respond to an item that asks simply whether the abbreviated title of the journal is given? To avoid this type of problem, we defined each item on the data sheet with three objectives in mind:

1. To break down complex standards into their components, and treat each component as a separate item. As a result of this detailed approach, the data sheet contains a total of 129 parameters of evaluation.

2. To assess compliance with each item on the basis of three different conditions: presence (P), presentation (R), and location (L). If the item is not present, the other two conditions cannot be satisfied. However, the presence of a given element does not necessarily imply its correct presentation or location.

3. To ensure that the user understands exactly what is being evaluated in each item. To avoid the need to evaluate degrees of compliance, each condition needs to be precisely defined, and the reasons why it is necessary to check compliance with distinct elements of each standard need to be made explicit. In the Appendix,* which is intended to be used in conjunction with the data sheet, we explain the content of each data element, what it seeks to evaluate, and the acceptable criteria for each response.

The Appendix also contains supplementary information on the standards we analyzed. As well as serving as a guide to the completion of the data sheet, it is also potentially useful as a reference document for those who wish to check compliance with standards in any other scientific document, and for those involved in creating or revising standards. The Appendix contains a detailed

commentary on (and, in some cases, an interpretation of) each standard in the data sheet. We suggest that some recommendations of other institutions related with scientific publishing (e.g. UNESCO, ICSU, and ISI) be made prescriptive, and propose new items that might facilitate scientific information transfer and communication.

The appearance of each item on the data sheet was designed to reflect several formal characteristics of the standard under consideration. As explained above, our intention was to evaluate as many aspects as possible of each standard. On the data sheet, prescriptive standards are stated as characteristics that "shall be" a certain way, and the number of the relevant standard is given. Optional standards, expressed with phrases such as "is recommended," "when possible," "can appear", or "should be" and are indicated with a capital O. Elements not contained in any current standard but recommended by us are indicated with an asterisk. When the results of the evaluation are analyzed, it is important to distinguish between these three types of items.

To respond to each item in the data sheet, and to quantify compliance in terms of presence, presentation and location, the following symbols are used:

1. An X signifies that the item is not applicable, and is used when the information required is not necessary or does not apply to the journal or document under evaluation. For example, in journals that publish a single issue annually, the issue and volume do not exist as distinct divisions, but usually represent the same physical compendium of contributions. In these cases, only the items concerning individual issues are evaluated, while those pertaining to volumes are marked with an X. Another example is item 33, which inquires about a change in the title of the journal. If there has been no change in title during the period being sampled, this item is also marked with an X, and excluded from further analysis as not applicable.

In some cases it may be impossible to evaluate an item because it may be unnecessary in a particular contribution or publication. An example is item 127, which deals with the presentation of illustrations. The inclusion of illustrations and their location within the text depend on the nature of the text and the author's decision, rather than on compliance with any standard. If an item cannot be as-

* Available in Spanish on request from the authors.

sessed because the material it pertains to is absent from the journal being evaluated, the corresponding item is marked with an X.

2. A plus sign (+) is used to signify compliance with a standard or an element of a standard, as stated in the data sheet or as explained in the appendix. As noted earlier, an + in the column headed "Presence" does not necessarily mean that the columns headed "Presentation" and "Location" will also receive a favorable score; either or both may in fact be incorrect.

3. A minus sign (-) is used to indicate noncompliance with the standard as defined on the data sheet and in the appendix. If the element is missing from the journal, the column headed "Presence" is marked (-), and the columns headed "Presentation" and "Location" are left blank. The absence of any item, whether preceptive, optional, or recommended, logically means that its presentation and location cannot be evaluated.

In summary, the instrument is structured on several levels, and is designed to be as flexible as possible in order to allow others to evaluate standards different from those we have included in the version of the data sheet presented here. Some of the variables that can be used to search for correlations between compliance practices and characteristics of the periodical under consideration are frequency of publication; place of publication, scientific fields, specialties or subspecialties; and the nature of the publication (e.g. for profit or non-profit publication; trade or professional society publication).

Acknowledgements

We thank Ms Karen Shashok for translating the original manuscript into English, and for helpful editorial suggestions.

References

1. Ferreiro L, Jiménez E. "Procedimientos de evaluación de las publicaciones periódicas. Estudio crítico de su empleo en las revistas científicas españolas". *Revista Española de Documentación Científica*, 1986; 9: 9-25.

2. French HJ. "Standardization as a factor in information transfer". *Journal of Information Science*, 1981; 3: 91-100.

3. Côté C. "La normalisation: un outil essentiel pour le transfert de l'information". *Documentaliste. Sciences de l'Information*, 1985; 22: 9-11.

4. Line MB. "The publication and availability of scientific and technical papers: an analysis of requirements and the suitability of different means of meeting them". *Journal of Documentation*. 1992; 48: 201-219.

5. Sancho R. "Indicadores bibliométricos utilizados en la evaluación de ciencia". *Revista Española de Documentación Científica* 1990; 13: 842-865.

6. Proyecto de difusión de las revistas científicas españolas en las bases de datos internacionales. Madrid, 1987: p.7.

7. Kövendi D. "La presentación de las publicaciones periódicas de documentación, bibliotecas y archivos y las normas de la ISO". *Boletín de la Unesco para Bibliotecas*, 1975; 19: 220-234; Lima Martins MD. "Avaliação da normalização de periódicos brasileiros nas áreas de ciência e tecnologia". *Revista de Biblioteconomia de Brasília*, 1986; 14: 197-208; Blanco Pérez A., Gonzalez Guitián C., Touriño Miguez E. "El grado de cumplimentación de las normas editoriales internacionales por parte de las revistas de enfermería". *Enfermería Clínica*, 1994; 4: 162-165.

8. Hills J. "The presentation of British scientific serials". London, 1971; Hanson, C.W. "Conformity to standards in documentation". *Libr. Ass. Rec.*, 1972; 74: 233-234; Leong A. "The International Organization for Standardization's (ISO) Recommendations on the presentation of documentation, library and archives journals and the 'Singapore libraries'". *Singapore Libraries* 1977; 7: 13-17. Ruiz Pérez R. "La normalización de las revistas científicas. Resultados de un análisis de muestreo". *Documentación de las Ciencias de la Información*, 1989; 12: 217-227.

9. "Informe sobre la evaluación de las publicaciones periódicas españolas de Ciencia y Tecnología". Madrid 1984; Ortega C, Vazquez M. "Estudio de las publicaciones periódicas españolas en Ciencia y Tecnología". *Boletín de la Anabad*, 1986; 36: 391-405. Ortega C, Vazquez M. "Estudio comparativo de las revistas españolas de Química". *Química* 2000, n. 14, p. 35-39. Alvaro C, San Millán MJ. "Datos para la valoración de las revistas españolas de Derecho Fiscal". *Revista Española de Documentación Científica*, 1979; 2: p. 217; Ortega C., Plaza LM, Martin MJ. Urdin MC. "Spanish scientific and technical journals. State of the art". *Scientometrics*, 1992; 24: 212-242.

10. Ortega Fernández C, Plaza Gomez LM. "Las revis-

tas españolas de Ciencia y Tecnología como vehículos de difusión de la investigación científica". *Revista Española de Documentación Científica*, 1993; 16: 221–228.

11. Ruiz Pérez R. "El concepto de Unidad Bibliográfica y su importancia en el contexto de la Descripción en dos Niveles y la Catalogación Analítica". *Revista Española de Documentación Científica* 1991; 14: 157–177.

Appendix 1

- ISO 4: 1984. Rules for the abbreviation of title words and titles of publications.
- ISO 8: 1977. Presentation of periodicals.
- ISO 18: 1981. Contents list of periodicals.
- ISO 214: 1976. Abstracts for publications and documentation.
- ISO 215: 1986. Presentation of contributions to periodicals and other serials.
- ISO 639: 1988. Code for the representation of names of languages.
- ISO 690: 1987. Bibliographic references – Content, form and structure.
- ISO 832: 1975. Bibliographical references – Abbreviations of typical words
- ISO 999: 1975. Index of a publication.
- ISO 2014: 1976. Writing of calendar dates in all-numeric forme.
- ISO 2145: 1978. Numbering of divisions and subdivisions in written documents.
- ISO 2384: 1977. Presentation of translations.
- ISO 3297: 1986. International standard serial numbering (ISSN).
- ISO 5122: 1979. Abstract sheets in serial publications.
- ISO 6357: 1985. Spine titles on books and other publications.
- ISO 9115: 1987. Bibliographic identification (biblid) of contributions in serials and books
- UNESCO. Programa General de Información y UNISIST. (PGI-79/WS/8).
- Directrices para los directores de revistas científicas y técnicas / [preparadas por] Helmut Grunewald.

Appendix 2

JOURNAL IDENTIFICATION

TITLE				
TITLE KEY:				
ISSN:	VOL.:	Nº:	AÑO:	Frequency of publication:
PLACE OF PUBLICATION		EDITOR		Code:
FIELD OF SCIENCE				
Unesco code:	Subject:			
TYPE OF JOURNAL:				Code:

PRESENTATION OF THE JOURNAL

GENERAL FEATURES			Score		
Standard	Nº	ITEM	P	R	L
I. GENERAL FEATURES					
	1	Regularity		X	X
ISO 8: 4.1, 8	2	Size, colour, typographic layout		X	X
VOLUME					
II. PAGINATION AND FIRST PAGE OF COVER OR FIRST PAGE AFTER INSIDE FRONT COVER					
ISO 8: 10.1	3	Continuous pagination			X
ISO 8: 6.1	4	Presence of volume cover		X	X
ISO 8: 3, 6.3	5	Title of journal			X
ISO 8: 6.3	6	Organization name or people responsible for the work		X	X
ISO 8: 6.2, 6.3	7	Volume number			X
ISO 8: 6.3, 7.2	8	Year, part of a year or years covered by the volume			X
ISO 8: 6.3	9	Place(s) of publication		*	X
ISO 8: 6.3	10	Name and address of publisher			X
ISO 8: 6.3	11	ISSN			
ISO 8: 4.6 ISO6357: 3.1, 3.3	12	Spine (content and layout)			
III. VOLUME CONTENT LIST					
General items					
	13	Title of journal			
ISO 8: 6.1	14	Presence of contents list			
	15	Layout			X
	16	Translation of contents list			X
Heading for table of contents of volume					
	17	Heading labeled "Table of contents"			
	18	Abbreviated journal title			
	19	Volume number and year			
	20	Period covered by the volume			
	21	Pagination of volume			
	22	ISSN			
Information on each contribution					
	23	Authors' names			
	24	Title of article			
	25	Original language, coded			
	26	First and last page			
IV. VOLUME INDEX					
ISO 8: 6.1, 13.1 ISO: 999: 7.1	27	Presence of index			X
Index heading					
	28	Mention of "Index"			
ISO 8: 3.4 ISO 999: 5.2	29	Title of Journal			
ISO 8: 10.4 ISO 999: 5.2	30	Volume number			
ISO 8: 10.4 ISO 999: 5.2	31	Period covered by volume			

ISSUE					
V. FIRST PAGE OF COVER OF ISSUE					
ISO 8: 3, 4.2	32	Title of Journal			X
ISO 8: 3.5	33	Change in journal title			
ISO 8: 4.2	34	Volume number			
ISO 8:4.2, 5.1	35	Issue number			
	36*	Period covered by issue			
ISO 8: 4.2, 7	37	Date of publication			
ISO 8: 4.2 ISO 3297: 6	38	ISSN			
PGI-79/WS/8	39*	Place of publication			X
PGI-79/WS/8	40	*Publisher			X
ISO 8: 4.5	41	Indication of volume summary in issue			
ISO 8: 5.4	42	Indication of end of volume in issue			
ISO 8: 13.2	43	Mention of index		X	
ISO 8: 4.6 ISO 6357: 3.1, 3.3	44	Spine (content and layout)			
VI. INFORMATION ABOUT THE JOURNAL					
ISO 8: 4.3	45 O	Frequency of publication		X	
	46 *	Scope		X	
ISO 8: 4.3	47 O	Identification of editorial, administrative and distribution offices		X	
ISO 8: 4.3	48 O	Postal addresses of editorial, administrative and distribution offices		*	
ISO 8: 4.3	49 O	Identification of editor and editorial secretariat		X	
ISO 8: 4.3	50 O	Affiliation of editor and editorial secretariat		*	
ISO 8: 4.3	51 O	Identification of editorial board, and affiliation of each member			
	52 *	Identification of advisory committee, and affiliation of each member			
ISO 8: 4.3	53 O	Information about subscriptions		X	
ISO 8: 4.3	54 O	Price per issue			
	55 *	Information on postal delivery		X	
	56 *	Availability for exchanges		X	
	57 *	Opinion disclaimer		X	
	58 *	Authorization to reproduce		X	
	59 *	Legal deposit		X	
	60 *	CODEN		X	
	61 *	Databases the journal is cited in		X	
Instructions to authors					
ISO 215	62 O	Presence of instructions to authors		X	
ISO 215: A.2	63 O	Types of media accepted (print, diskette, etc.)		X	
ISO 215: A.3-4	64 O	Formal logical structure		X	
ISO 215: A. 3-4	65 O	Physical structure		X	
ISO 215: A.5	66 O	Illustrations		X	
ISO 215: A.6	67 O	Form of references		X	
ISO 215: A.7	68 O	Forwarding of manuscript		X	
ISO 215: A.8	69 O	Proof correction		X	

ISSUE					
VII. ISSUE CONTENTS LIST					
ISO 8: 3.4	70	Title of journal			
ISO 8: 12.1 ISO 18: 4.1-3,5	71	Presence of contents list			
ISO 8: 12.3, 12.4 ISO 18: 4.2, 5, 6.3, 6.4	72	Sections headings			X
ISO 8: 12.5 ISO 18: 4.4 ISO 639	73 O	Translation of contents list			X
Heading of table of contents for issue					
ISO 18: 6.1	74	Heading labelled "Table of Contents"			
ISO 8: 4.4	75	Abridged journal number			
ISO 18: 6.1	76	Volume number			
ISO 18: 6.1	77	Issue number			
ISO 18: 6.1	78	Issue page numbers			
ISO 18: 6.1	79	Period covered by issue			
PGI 79/WS/8	80 *	CODEN			
ISO 8: 4.2	81	ISSN			
Information on each contribution					
ISO 8: 12.2 ISO 18: 6.2	82	First and last names of author(s)			
ISO 8: 12.2 ISO 18: 6.2	83	Title of article			
ISO 18: 4.4.2 ISO 639	84	Original language coded			
ISO 8: 12.2 ISO 18: 6.2	85	First and last pages			
VIII. RUNNING TITLE					
ISO 8: 9	86	Abridged title of the journal			
ISO 8: 9	87	Volume number			
ISO 8: 9	88	Issue number			
ISO 8: 9	89	Period covered by issue			
	90 *	First and last page of article			
IX. ABSTRACT SHEET FOR ISSUE					
ISO 8: 12.6 ISO 5122: 5.2	91	Presence of abstract sheet			
ISO 5122: 6	92	Translation abstract sheet			*
Heading of abstract sheet					
ISO 5122: 4.1	93	Title of journal			
ISO 5122: 4.1	94	ISSN			
ISO 5122: 4.1	95	Data publication			
ISO 5122: 4.1	96	Source of classification		X	
ISO 5122: 4.1	97	Source of descriptors used in blocks		X	
ISO 5122: 4.1	98	Permission to reproduce abstract sheet		X	
Information in each block					
ISO 5122: 4.2	99	Notation of classification of article			
ISO 5122: 4.2	100	First and last names of author(s)			
ISO 5122: 4.2	101	Author's professional affiliations and place of work			
ISO 5122: 4.2	102	Title and subtitle in original language			
ISO 5122: 4.2	103	Translation of title into language of the abstract sheet			
ISO 5122: 4.2 ISO 639	104	Language in which the article was published, coded			
ISO 5122: 4.2	105	Bibliographic reference, preceded by "In"			
ISO 5122: 4.2	106	Article abstract		X	
ISO 5122: 4.2	107	Free terms		X	

PRESENTATION OF CONTRIBUTIONS

X. BIBLIOGRAPHIC INFORMATION					
ISO 215: 4.1	108	Content-appropriate title		X	*
	109 *	English translation of title			
ISO 215: 4.2 ISO 690: 7.1.2	110	First and last names of author(s)			*
	111 *	Institutional or professional affiliation of authors			
ISO 215: 4.2	112	Postal address			*
	113 *	Area of expertise of author		X	
PGI-79/WS/8	114 *	Indication responsible of correspondence		X	
ISO 215: 4.4	115 O	Place and date of completion of the contribution			*
ISO 215: 4.4	116 O	Date of completion of the revision of the contribution by the journal			*
ISO 215: 4.4	117 O	Date of acceptance of the final version			*
ISO 9115	118	BIBLID [ISSN (year of publication) vol n°: issue n°; first-last page]			
ISO 215: 4.3.1	119	Author's abstract		X	*
ISO 215: 4.3.2	120	Key words or descriptors		X	*
ISO 215: 4.3.1	121	Translation of the abstract and key words		X	*
ISO 215: 5.2	122 O	Contents list of article		X	
Running title					
ISO 8: 9	123	First and last names of author(s) or of first author			
ISO 8: 9	124	Complete or abridged title of article			
XI. MAIN TEXT OF CONTRIBUTIONS					
ISO 215: 5.1	125	Structure of scientific articles	X		X
ISO 215: 5.2 ISO 2145	126	Numbering of divisions and subdivisions			X
ISO 215: 7	127	Illustrations and tables	X		X
	128	Method of bibliographic citation	X		X
	129	Bibliographic references: content, form and structure	X		X