

# The scientific journal, a role for mediation of information between researchers: what future in the digital environment?

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## Abstract

The arrival of journals in the seventeenth century followed a long period of informal exchanges of letters between researchers (letters of Père Mersenne, 1617-1637). They were tasked to gather scholars for research in common but also to control all scientific activity. Journals already had both the expertise and role of arbitration. Role for scientific diffusion allowing greater visibility of research, they become a practice of science (PRICE, 1961) and the scientific article the main form of scholarly communication. In the 1990s, the whole system of diffusion of science is affected by the use of the Internet at different levels depending on the discipline. Electronic publishing seems to have found its audience and readership particularly in science, technology, and medicine (STM) and seems to change the practices of reading and consultation. But these new uses they upset the conditions and challenges of diffusion of results? To answer this question we conducted an investigation with a population of researchers from a school of engineering in chemical and technological arts (ENSIACET).

## Keywords

scientific journal; electronic publication; information practices; engineering science; researchers

## Introduction

Several works in the sociology of science and information science and communication have shown the fundamental role of science communication in the work of researchers (MERTON, 1973; GARVEY, 1979; LATOUR et al., 1988; LATOUR 1995) and more specifically of scientific journals and their social role (BOURE, 1996).

In science, scientific research is not complete until the results are not published. The researcher communicated through books, journals, and during conferences. In science, technology, and medicine (STM), the jour-

nal is an important means of expression and diffusion of knowledge through the article, primary document, which provides full and original information. The article, « *contribution évaluée et publiée sous une forme normalisée dans une revue savante* », is the significant unit of the scientific journal (DEVILLARD et al., 1993).

The creation of the journal in the seventeenth century under the name of “newspaper” has brought together scientists for joint research but also to control all scientific activity. She had a role of expertise and arbitration. It was not until the eighteenth century that

the publication in the journal becomes a practice of the scientific community (PRICE, 1961). It is the role for communicating scientific information validated.

According to the definition Lamizet (1997) published in « Dictionnaire encyclopédique des sciences de l'information et de la communication », science communication is « *l'activité que déploie chaque chercheur pour mettre en forme ses travaux, les faire connaître à ses pairs, se tenir au courant des recherches d'autrui* ». This definition is limited to exchanges between researchers. However, other authors have proposed to expand the meaning of integrating forms of communication from scientists to the general public (VERON, 1997) and interaction between practitioners and researchers in written (COUZINET, 2008). Here, we refer to communication *stricto sensu*.

In recent years, initiatives and movements for open access have been developed to make available to all, the publications of researchers. New forms, new media types appear as the electronic journal and open archives, to favour on free access to this information. With electronics, the documentary unit that makes sense would be more the journal but the article. It seems that electronic publishing would change the practices of reading and journals consultation. But what is it really? Is there adaptation or mutation in the communication process of scientific and technical information? The pace of new initiatives related to electronic publications is increasing but there is a new scale debate on the future of scientific communication? To answer this question we conducted an investigation with a population of researchers from an engineering school (ENSIACET). The study of uses of electronic publications was based on methods and analysis tools that are the questionnaire and interview.

The first part of this work is first to define the role of the scientific journal for researchers and to introduce new forms of electronic publishing. In the following, our approach is to understand how is the integration of digital information practices and publication of research in sciences of engineering.

## Scientific journal as a means of diffusion of knowledge

### The birth of the scientific journal

Information diffusion in science is an ancient tradition. From the fifteenth century, scientists used as a means of expression, the book. In the early seventeenth century, the correspondence by exchanges of letters between scientists and scholars could develop and maintain for 30 years, thanks to the Père Mersenne (1588-1648) initiated the first network of scientists (BEAULIEU, 1995; MAURY, 2003). This informal exchange of letters allowed for a wider diffusion of information on current experiences and news about what was being done in Paris and learned in Europe. The work was validated at both scientifically by a collective and human praise.

To solve the problems of slow diffusion of knowledge, impartiality, priority and greater visibility of research (OTLET, 1934), the scientific journal was created

as an alternative to book. Some of these targets are also those for which the journals are now contested.

### The functions of the scientific journal

Scientific journals are born, we have seen, the impossibility, both epistolary communications as books, to adapt to new requirements in science, the demands of a wider, faster and recognition of scientists through the establishment of priorities on the discoveries. The “newspaper” is seen as a role for scientific diffusion allowing greater visibility of the work. In addition to protect discoveries and peer approval, it guarantees promotions and careers. The role of scientific writing is modified; it involved its author about his findings on these ideas. If this method of publishing the results of science appears as soon as appropriate, this success is not assured at the outset, some scientists regard the journal as opposed to the recognized practice of handwritten letters and brings the risk of see publish anything and everything (FAYET-SCRIBE, 1997).

In the nineteenth century the term “newspaper” is replaced by “journal”. The journal takes the form we know today. Science known as “hard” the centrality of the journal is based on several factors: the design of an experimental science, the need to maintain the flow of scientific discoveries, the need for validation and the need to obtain the exclusive discoveries. The journal is associated with a validation identified by an editorial board composed of scientists in their field. This validation process is called “peer review”. Often, the reputation of members of the reading committee that built the reputation of a journal. The certification attests to the quality of research and validity of results.

Very quickly, the scientific article that became the main form of scholarly communication. It is not only for researchers with a means for communicating the knowledge he has built, to make a discovery and an exchange between researchers, but also the means to obtain the approval of peer which guarantees the scientific level of work and can be recognized as a member of his community. Journals are now several functions in scientific communication as diffusion of research and archiving, retention of intellectual property, scientific quality control, and evaluation researchers.

### The forms of electronic publication of scientific knowledge

In the 1990s, the Internet affects the mode of knowledge diffusion. Led by Paul Ginsparg created a database of “e-print” dedicated to physicists. The creation of this database is under the sign of a protest and a questioning of dominant models editorials. Then, servers online (institutional or not) are deployed, on which researchers can submit their writings to make them accessible to all without hindrance: “pre-print”, “print” or “post-print” (on talks about open archives). Scientific validation is no longer satisfied by a reading committee, but only by readers, experts and outside the area. Similarly, electronic journals exclusively develop on

the web with or without peer. But the dominant supply of electronic publications is now available in electronic form of printed journals. These two systems coexist which makes the definition of electronic journals difficult (COUZINET, 1999).

With electronics, the documentary unit that makes sense is not the journal but the article. Faced with the electronic publication of results, how the practical information and diffusion of research evolve and how are they affected or reinforced? To answer these questions we conducted an investigation with a population of researchers from an engineering school. As a first step, we studied the ways of a group of some researchers. In a second step was to see if the electronic writing led to developing new practices and publishing information. These tests as part of a long-term research partially presented here. These initial results were used to refine the issue of a work which was presented at the end of the year (BÉGAULT, 2008).

## Information practices

Faced with the electronic information practices and the diffusion of research results are shaken and vary according to the research areas. Many studies (CHARTRON, 2002; MAHÉ, 2002; PIGNARD-CHEYNEL, 2004) have demonstrated the integration of electronic journals in the practices of researchers in the sciences. It seems to us that to develop an overview of significant practical side to electronics, it remains to explore the disciplines of technology. We chose to take an interest in engineering.

## Research practices of information

We chose the method of field survey in order to meet researchers whose information needs are important and are confronted daily with electronic resources. Since 2002, our field research, they have access to journals from publishers also broadcast in digital form their printed journals. In 5 years, the number of journal titles available in electronic format has doubled and in parallel the number of articles downloaded increased.

Researchers interviewed continue to seek information from bibliographic databases and do ScienceDirect (Elsevier) journal portal that provides access to 2500 journal titles in 2008, in order to obtain the full text searching above all (the) journal (s) important (s) in their research. For some, the interest in the electronic medium is the possibility to search in full text. They are aware of “noise” obtained and they can miss relevant information, but these consequences do not seem to be felt as most receive training based on a critical sense, that is to say they know to differentiate the mass of information that are validated and relevant. Access to information remains essential. However, they are content to use specific resources available to them. The proposed method of diffusion does not encourage them to develop further research. Their consultation practices of information do not exceed the scope of the journals in their fields.

## Reading practices

They do over the printed version of the journal even if the length of the text appears to be an obstacle to reading online where printing to read. The presence of hyperlinks does not give a new dimension to their reading of research. Some researchers do not use links in order to avoid a loss of relevance and a vertical reading. The elements identified here are consistent with those reported in various studies on the uses and practices of researchers to address electronic publishing.

At this stage, the choice to read or publish in any journal is not linked to its “impact factor”. The research areas of respondents were very specific items are necessarily less cited and although very relevant, only a minority of researchers.

Moreover, they do not follow the developments related to the movements and initiatives on open access for lack of information and therefore do not open archives.

## Diffusion practices

### Position in the validation and protection of knowledge

Studies show that researchers fear that the public release of their “pre-print” does plagiarism (DE LA VEGA, 2000), loss of priority and credit for their work (HARNAD, 2000). However, some believe that the “pre-print” or self-publication would be a means of resolving the problem of priority in the research or intellectual property of scientific discoveries (PIGNARD-CHEYNEL, 2004).

However, we observe that in the case of engineering the refusal to file online is on the lack of control and validation by peers. This is not related to the fact that their intellectual property is not protected; the patent is also a way to do so. For some, the reluctance to diffuse pre-print seem to come from some shame and embarrassment of showing work may be of average quality. For them without work is not finished and may not be distributed. Validation by peers and the remarks of “referees” will improve the article so increasing its value.

However, we know that the evaluation process of researchers is challenged to follow cases of scientific fraud that appear increasingly in the press. Given the new initiatives that propose to make comments, remarks and corrections directly on the pre-print, or that the comments of referees were distributed with the post-print, respondents agree, but some expressed the need to control people who make comments about the pre-print.

In the case that we observe, scientific journals are still the preferred means of communication of scientific information in relation to monographs. They are associated with a validation identified by an editorial board. Respondents know that the validation process poses certain challenges, including the co-researchers for the creation of these bodies of validation, but the publication must and is recognized by the institutions that still have a reading committee. The researchers want to maintain

a scientific value to the articles. They are ready to be published online if the peer review is preserved.

These interviews reveal that the validation of research findings by committees of peers is always essential.

Indeed, we are in a period where the overproduction of information on servers continues to grow and the validation of content does not appear to be implemented in a systematic way. The movement toward electronic publishing in open access does not guarantee the quality or guarantees the reliability of results. The responsibility of researchers is involved because they must file articles of the same quality as those published in the conventional manner.

## Publication practices

The form of the printed paper is defined according to very specific criteria for a specific purpose, but not enough to pass from one medium to another to give it new life. The internal structure of the latter determines the modes of reading that you can not artificially change. Researchers are encouraged to rethink their writing practices, rules and constraints of electronic publishing are different from the paper edition (RYGIEL et al., 2005). If it is possible to reproduce the printed version on the web, however electronic publications unparalleled paper must find a suitable script support. What distinguishes the writing of the traditional electronics, the possibility of creating links. Hypertext change the users with knowledge. « *Le texte-web est centrifuge, incite à cliquer et à s'éloigner* » (VANDENDORPE et al., 2002).

In writing specific to the network, not the writing that is essential but the formatting of content and development. Similarly, the structuring of the data determines their access and their research. However, if the rules of presentation and writing scientific articles are well-known actors in the production of this type of paper documents, they remain very poorly defined in the case of articles in electronic (BEN ROMDHANE et al., 1997).

Researchers interviewed do not seem ready to be prime contractor for the digitization of their articles. There are already constraints in writing the articles to which the author is required according to the instructions and advice of publishers.

Written communication of the research is crucial to the functioning of science. The previously constructed knowledge base are used to thinking and advanced research. The publication is crucial in the research process. They are made in scientific journals that allow a rapid and regular information. In addition to being a medium for information diffusion, the article is also an instrument for assessing the quality of search results. The act of publication is part of a quest for legitimacy and recognition of scientific or economic.

## Conclusion

The researchers are ready to be published online if the peer review is preserved. Thinking about the future

of journals does not seem to be based only on the opposition print / electronic and the problem of economic research units and libraries. Researchers are rarely aware of these economic issues.

These interviews reveal that the choice between printed journal and articles scanned and available in full text remains. Validation of research findings by committees of peers seems always essential. Reflection on content distribution and the role of publications in the diffusion of knowledge seems to be studied in terms of representations of the value of peer review. At this stage of our work we do here can deliver only partial results, we can formulate the general assumption that the priority of discovery, of position in a given community in terms of reputation and career progression, do not change with the type of medium for the diffusion of science. This requires of course be refined and to be linked to the practice of writing to understand the distortions between uses of information and knowledge production.

It is important to consider not only the diffusion but also the content and role of publications in the diffusion of knowledge and evaluation of results (SABBAH, 1999). What are the issues of electronic publishing? Will there be an enhancement of the autonomy of the items as suggested by the success of preprint server Paul Ginsparg or to a redefinition of peer review following the model of organization of public criticism as it found in the journal "Psychology" of Steven Harnad?

Can we speak of a "revolutionary" transfer supported by technology? The situation is not original. Internet makes a wide diffusion of knowledge that the first correspondence and journals in Europe in the seventeenth century provided more modestly. The movement of open archives is a resurgence of the old exchanges including those in epistolary form. Indeed, the practice of open archives is based on an ancient tradition which was the direct exchange of correspondence between scientists. This movement is a sort of return to old forms of scientific exchange. The first epistolary form has persisted even with the emergence of periodicals in the seventeenth century. We can then assume that the journal will not disappear but will live for some time with the open archives. There is a link between the letters and the first scientific journals, manuscripts and early books, scientific journals and the first scientific journals in electronic format. The transition from one form to another was the result of a dispute about the slow diffusion, validation and the priority of knowledge.

In parallel, the number of exclusively electronic journals over paper production remains low. For now, these two models coexist. We are in a transitional phase with many unknowns, where the overproduction of information freely available is increasing but the quality or reliability of the results are guaranteed.

## Bibliographic references

BEGUIN, A., CHAUDIRON, S., DELAMOTTE, E. *Études de Communication*, 2007, n° 30, Entre infor-

mation et communication, Les nouveaux espaces du document.

BEGUIN-VERBRUGGE, A. Le corps dans les lectures à l'écran. *Spirale*, oct. 2001, n°28, Nouveaux outils, nouvelles écritures, nouvelles lectures, p. 145-162.

BEGUIN-VERBRUGGE, A. Le traitement documentaire est-il une énonciation ? In Société Française des Sciences de l'Information et de la communication. Les recherches en information et communication et leurs perspectives: Histoire, objet, pouvoir et méthode : 7-11 octobre 2002 Marseille, Palais du Pharo. Marseille : SFSIC, octobre 2002. p. 329-335.

BEGUIN-VERBRUGGE, A. Images en texte, images du texte. Lille: Presses Universitaires de Septentrion, 2006. 318 p.

BEGUIN-VERBRUGGE, A. Pourquoi faut-il étudier les pratiques informelles des apprenants en matière d'information et de documentation? Colloque international : Savoirs et acteurs de la formation, Rouen, 18-19-20 mai 2006.

BEGUIN-VERBRUGGE, A. Images hybrides et lectures mixtes. Les Dossiers de l'Ingénierie éducative. Hors série Images, savoirs, numérique. SCEREN/CNDP, 2007. p. 63-79.

BOLKA, L. Eléments pour l'analyse sémio-pragmatique du transfert multisupport de l'image télévisuelle : le cas des images de la « télé-réalité » sur Internet et dans la presse magazine. Thesis. Lille 3, 2007.

CARNEL, J-S. Réutilisation des images animées dans les chaînes hertziennes françaises. Thesis. Lille 3, 2009.

CHARTIER, R. Le livre en révolution. Paris: les éditions Textuels, 1997. 160 p.

COMPAGNON, A. La seconde main: ou le travail de la citation. Paris: Seuil, 1979. 416 p.

COTTE, D. Des médias au travail: emprunts, transferts, métamorphoses. Rapport de soutenance pour l'habilitation à diriger des recherches. Université d'Avignon et des pays de Vaucluse, 5 novembre 2007.

DESPRES-LONNET, M., COURTECUISSÉ, J-F. Les étudiants et la documentation électronique, *Bulletin des Bibliothèques de France*, 2006, n° 2, p. 33-41.

DUCROT, O., SHAEFFER, J-M. Nouveau dictionnaire encyclopédique des sciences du langage. Seuil, 1995.

ECO, U. Kant et l'ornithorynque. Paris: Grasset, 1997. 480 p.

FOUCAULT, M. L'Archéologie du savoir. Paris: Gallimard, 1969. 288 p.

GENETTE, G. Palimpsestes: la littérature au second degré. Seuil, 1982.

GIORDAN, A., GIRAULT, Y., CLEMENT, P. et al. Conceptions et connaissances. Berne: Peter Lang, 1994.

JEANNERET, Y. Y a-t-il (vraiment) des technologies de l'information ? Lille: Presses Universitaires de Septentrion, 2000. 136 p.


Kovacs, S. L'image scientifique et ses recontextualisations : du Notionnaire de Garsault (1761) à l'Encyclopédie des jeunes gens (1807) de Moustalon. *Spirale*, octobre 2006, n°40, Nouvelles images pour apprendre, p. 9-26 .

LE MAREC, J. Evolution de la problématique des usages : le cas des NTIC en milieu culturel. *Spirale*, oct. 2001, n°28, Nouveaux outils, nouvelles écritures, nouvelles lectures, p. 105-122.

Moscovici, S. La Psychanalyse, son image, son public. PUF, 1961.

PERRIAULT, J. et al. Hermès, 2004, n°39, Critique de la raison numérique. Introduction.

SOUCHIER, E. L'image du texte : pour une théorie de l'énonciation éditoriale. *Les Cahiers de médiologie*, 2ème sem. 1998, n°6, « Pourquoi les médiologues » ? . p. 136-145.

TETU, J-F. Sur les origines littéraires des Sciences de l'Information et de la Communication. In BOURRE, R. (ed.) . Les origines des sciences de l'information et de la communication – Regards croisés, Lille, Presses universitaires de Septentrion, 2002. p. 71-94. 

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L'article comme moyen de diffusion des recherches: quels changements dans le contexte numérique ? Colloque Médiations et usages des savoirs et de l'information: un dialogue France – Brésil (Réseau MUSSI), Rio, 4-7 novembre 2008, p.281-291.

Usages et pratiques de la publication électronique des résultats de la recherche. Le cas des sciences de l'ingénieur. Document numérique. Usages et numérique, vol. 10, n°3-4, p.47-61.

Publication électronique et légitimation des recherches en sciences de l'ingénieur. Colloque international EUTIC 2007 - Enjeux et usages des TIC - Médias et diffusion de l'information: vers une société ouverte, Athènes, 7-10 novembre 2007, p.363-370.

Diffusion écrite et légitimation des recherches dans la publication électronique: le cas des sciences de l'ingénieur. XIIIe Colloque National de la Recherche des IUT Université Paul Verlaine-Metz et IUT de Thionville-Yutz, Thionville, 31 mai et 1er juin 2007, actes sur cédérom, 8 p.