Research paper

Scientific journals: its insertion in didactics materials in the specialization course on Educational Technologies from UFSCar

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Abstract
This paper aims at analyzing the use of scientific electronic papers and journals in the didactics material of the specialization Course on Educational Technologies from UFSCar. The bibliographical analysis focused on the development and legitimacy of scientific journals. The purpose of the documental analysis on the didactic material, composed by 48 volumes, was to verify the kinds of material cited and suggested in the multimedia study guides. The data show that books are the most cited material, whereas other electronic materials are the most suggested kind of complementary material. The international scientific community considers papers published in scientific journals as the main and most legitimate mean of scientific knowledge sharing. They are the third most cited and suggested kind of material by the author-docents. This result indicates dissociation between the course didactics material and its innovative proposal of hybrid, flexible and integrated education. It is also dissociated from the international trends of scientific knowledge legitimacy. Such dissociation, commonly found in human sciences, may jeopardize the quality of the Brazilian science and its integration in the international scientific community.

Keywords: Scientific journals, Legitimacy, Didactics materials, Educational technology.

Introduction

We currently live the information era. All kinds of technology and information are disseminated around the world, even if in a selective way, contributing to the globalization phenomenon (CASTELLS, 2000). According to Castells (2004), the specific aspects of this new information system are its capacity of i) expansion, considering volume, complexity and speed; ii) communication, which allows constant feedback and information recombination; and iii) flexibility of distribution via an interactive and digitalized network.

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Within the educational context, Bates (2004) considers that, after the book, the internet is the technology that more intensely permeated teaching and learning. Lévy (1997) traces a history since oral societies until the internet rise. Specifically about the support for knowledge storage and sharing, the author says:

> Paper fixes a text and establishes its precise location. (...) Unlike a printed page, a web page is a dynamic, open, ubiquitous object connected to a nearly infinite corpus. (...) [The web page] links us technically and immediately to the pages of other documents, scattered all over the world, which themselves refer to other pages, and so on indefinitely (LÉVY, 1997, p. 251).

Among these new technologies accessible since internet popularization are the scientific electronic journals. These journals maintain procedures to guarantee quality according to international scientific standards and are indefinitely continued publications distributed via internet (OLIVEIRA, 2008).

The internet also offers new educational possibilities. “In particular, the area of continuing professional education is proving to be particularly appropriate for e-leaning” (BATES, 2004, p. 282). This happens due to its flexibility, which enables students to keep learning throughout their whole lives.

This flexibility also applies to the space-time character of learning. According to Mill (2014, p. 98, original emphasis), “the ICT [Information and Communications Technologies] enable unique experiences and new comprehensions regarding *place/space* and *schedule/time* of socialization”. The author says that: “when dealing with spatial flexibility in education, we are interested in geographic mobility, physical and commuting limitations of students, among other things” (MILL, 2014, p. 102).

The specialization course in Educational Technologies from Federal University of São Carlos (UFSCar) is a good example of professional education which benefits from the ICT. It offers not only flexibility on space, but also on curricular, pedagogic and time aspects (MILL; SANTIAGO; OLIVEIRA, 2018). On the top of that, the course offers several supports to the study content. Among them is a handbook – multimedia study guide – for each of the curricular components, available in digital format (PDF, ePUB and mobi) at the virtual learning environment.

Considering the specialization course on Educational Technologies from UFSCar and its proposal of ICT use; and scientific electronic journals as one of the most reliable sources for scientific knowledge sharing (SPIER, 2002; MUELLER, 2006; HARNAD, 1998), this research aims at answering the following questions: how is the academic production published in scientific electronic journals inserted in the specialization course on Educational Technologies from UFSCar? How does it compare to the use of books?

The objective of this study is to investigate the insertion of the academic production published in scientific electronic journals in the handbooks of the specialization course on Educational Technologies from UFSCar and compare it to the use of a more traditional material – the print book. To this purpose, we reviewed a bibliography on scientific electronic journals; analyzed the multimedia study guides from the specialization course on Educational

Technologies from UFSCar; and finally, compared the use of academic papers from scientific electronic journals and books.

Section 2, *The scientific electronic journal*, approaches the history of this kind of publication. It also covers the peer review process, as well as its different types and developments. Section 3 exposes the *Methodology* used in this work. Section 4, *The specialization course on Educational Technologies from UFSCar*, explains on detail the structure of the specialization course on Educational Technologies from UFSCar and the results from the analysis of the didactic materials of the course. Section 5 shows *Final considerations*.

2. The scientific electronic journal

Scientific electronic journals are inspired mainly by the newsletters from the 1970s. The first electronic periodic publishing project, the American Electronic exchange system, was launched at the end of the same decade. But first projects encountered many technological barriers, not allowing its continuity. The main barrier was authors and readers' lack of access to electronic equipment, not user-friendly interfaces and telecommunications problems (OLIVEIRA, 2008).

With the development of the ICT, in the 1980s, scientific electronic journals were finally established. At first with the use of CR-ROMs, until its development to the model we know nowadays. According to Oliveira (2008, p. 71),

> Scientific electronic journal is a publication intended to be indefinitely continued, which presents internationally accepted quality control proceedings for the published papers, and makes available the complete article online, with or without a print version or other type of support.

The most accepted quality control in the scientific community is the peer review. Spier (2002) reports one of the first peer review processes, at the 9th century. The author describes practices from a medical community which used to evaluate their peers – using notes about the patient and the treatment written by the doctor – aiming at assessing if the adopted proceedings were adequate to the patient's clinical condition. Since then, this practice developed in several ways around the world. In the 18th century, more than one scientific society used experts to evaluate the papers to be published in their journals. But only in the 20th century the variety of subjects and the amount of researches demanded the use of peer review (SPIER, 2002). In some cases the papers published in scientific electronic journals are benefited by the peer commentaries. This kind of contribution is allowed in some journals after the manuscript publication. It does not interfere with the selection process, but it could benefit the scientific knowledge development (MUELLER, 2006; HAMES, 2012).

According to Harnad (1998, p. 284), "the only trace of contribution to knowledge is one's work to be read, cited and complemented by his/her research fellows". The author adds that he does not believe in authors who prefer publishing books instead of articles in peer-reviewed journals. This shows how strongly he believes in the peer review legitimacy.

In science, “legitimacy is the process through which the ‘legislator’ in charge of watching over scientific discourse is authorized by the scientific community to prescribe the conditions that establish if a certain knowledge is considered scientific” (MUELLER, 2002, p. 30). These legislators, according to Mueller (2006), are researchers recognized in their community by their contribution to science.

According to Postman (1993, p. 13), “embedded in every tool is an ideological bias, a predisposition to construct the world as one thing rather than another, to value one thing over another, to amplify one sense or skill or attitude more loudly than another”, i.e., some elements that make it legit. Hence, the use of articles published in scientific electronic journals is “a big challenge in which center is the legitimization process of scientific electronic journals as recognized elements in the scientific communication system” (MUELLER, 2006, p. 37).

Analyzing the adhesion of Brazilian lecturers and graduate students to the use of scientific electronic papers, Oliveira (2007) concludes that

> the Information and Communication Technologies (ICTs) are reality to these professionals. Still, regardless of the investments of universities, the federal government and information related entities to the availability of access to electronic publishing, especially scientific journals, it is not completely accepted and used in all its potentialities (OLIVEIRA, 2007, p. 61).

In Oliveira’s study (2007), almost the totality of lecturers and graduate students affirm that they make use of scientific electronic journals, being students more frequent users than lecturers. More than half of the survey participants say that the access to titles not physically available in the library is the main advantage of using electronic journals,

> which confirms that technology enabled the availability of a broader variety of journals in comparison with what libraries could maintain in their physical collections. This was possible by the establishment of consortia (OLIVEIRA, 2007, p. 62).

The consortia the author refers to aim at guaranteeing, together with institutional repositories (MUELLER, 2006), the access to a large number of scientific electronic journals. Some important examples in the Brazilian context are the Capes Periodic Portal and SciELO (Scientific Electronic Library).

There is a lot of criticism to peer review. Criticisms include the lack of standardization to the evaluation (FERREIRA; BASTILLE-ROUSSEAU *et al.*, 2016; BLOCKEEL; DRAKOPOULOS *et al.*, 2017), and the lack of recognition from research and educational institutions to the work of professionals who contribute to the scientific community with their evaluation (BLOCKEEL; DRAKOPOULOS *et al.*, 2017; NATURE MATERIALS EDITORIAL, 2005; NATURE EDITORIAL, 2014). Still, the vast majority of authors agree that peer review is essential to secure the quality of the work published in scientific journals (FERREIRA; BASTILLE-ROUSSEAU *et al.*, 2016; SPIER, 2002; MUELLER, 2006; HARNAD, 1998; HAMES, 2012).

3. Materials and methods

This is an exploratory-descriptive research (PRODANOV; FREITAS, 2013) developed with bibliographic and documental technical procedures. According to Prodanov and Freitas (2013, p. 55),

> whereas the bibliographic research uses fundamentally contributions of various authors about certain topic, the documental research is based on materials which did not receive an analytical perspective or that could be re-elaborated according to the research objectives.

In view of the above, in this research we considered bibliographic materials the texts about the topic – scientific electronic journals, its characteristics and use – and documental materials the multimedia study guides – handbooks from the analyzed course. The bibliographic technical procedure enabled a qualitative analysis, whereas the documental technical procedure enabled a quantitative analysis.

The first step was the search for bibliographic material in libraries and digital sources. Bibliography was selected exclusively from digital database, including Google Scholar (https://scholar.google.com), Capes Periodic Portal (www.periodicos.capes.gov.br) and SciELO (www.scielo.org).

Subsequently, the documental material was selected. In total we gathered 48 multimedia study guides from the Educational Technologies Collection – Specialization Course (MILL; BEDER *et al.*, 2017), edited by Pixel publishing company. The multimedia study guides of all curricular components of the specialization course on Educational Technologies from UFSCar were downloaded from the virtual learning environment of the course in PDF format. Then the bibliographic data was compiled in a table (Appendix A) according to the type of bibliographic material cited: book/book chapter; dissertation/thesis/research report; conference paper; law/regulation; article/scientific journal; other electronic materials. Graphics exposing the data were generated from these tables.

The final step was the reflexive analysis of the two types of material, bibliographic and documental. The analysis' goal was to relate these materials between each other and with the research main objectives.

4. The specialization course on Educational Technologies from UFSCar

The specialization course on Educational Technologies from UFSCar has an innovative educational proposal when compared to other Brazilian courses. It is "an open, flexible, hybrid and integrated proposal" (MILL; SANTIAGO; OLIVEIRA, 2018, p. 5).

According to the authors, the first topic enabling the course openness, flexibility and integration is the possibility of specialization in five different habilitations: Instructional Design (Pedagogic Project and Design); Distance Education Teaching; Distance Education Management; Technology Production and Use in Education; Media Resources in Education.

Pedagogic flexibility is also facilitated by the possibility of students to choose their own "pedagogic path", i.e., which curricular components will

compose their curriculum. During the 18 months of course, there are around 60 different curricular components to be chosen.

The pedagogic proposal also cites as flexibility elements: common characteristics of distance learning, such as diversity of time and place of study; type of evaluation (respecting the legal parameters for education in Brazil); and diversity of didactic resources and strategies, enabling the students to use the resource(s) that best attend(s) their learning needs (MILL; SANTIAGO; OLIVEIRA, 2018, p. 6-7).

The course integration and hybridity are related to the different educational levels the student can obtain from the same course. On the top of that, the student can choose between *in loco* or distance learning.

To graduate, the student should attend to 20 curricular components, being five mandatory, ten elective and five of free choice (Figure 1), according to the chosen habilitation.

Figure 1 - Components of a habilitation in the specialization course on Educational Technologies from UFSCar.

Source: adapted from Mill, Santiago and Oliveira (2018, p. 8).

Every curricular component has different support media, namely: virtual learning environment (Moodle); multimedia study guide (e-book); video-lessons; web-conferences; and other materials according to the lecturer's choice.

4.1. The reading material of the specialization course on Educational Technologies from UFSCar curricular components

This work will focus on the multimedia study guides. They are reading materials available to the students on digital format (PDF, ePUB and mobi) in the virtual learning environment (MILL; SANTIAGO; OLIVEIRA, 2018, p. 44).

Each multimedia study guide has approximately 25 to 30 thousand characters. The texts are written by author-docents and usually contain (with slight variations from one to another) cover, technical information, table of contents, three chapters (units), one for each week of study on that curricular component, bibliographical references and a small author bio. In total, the specialization course on Educational Technologies from UFSCar has 48 titles, composing the Educational Technologies Collection – Specialization Course (MILL; BEDER *et al.*, 2017), edited by Pixel publishing company[3].

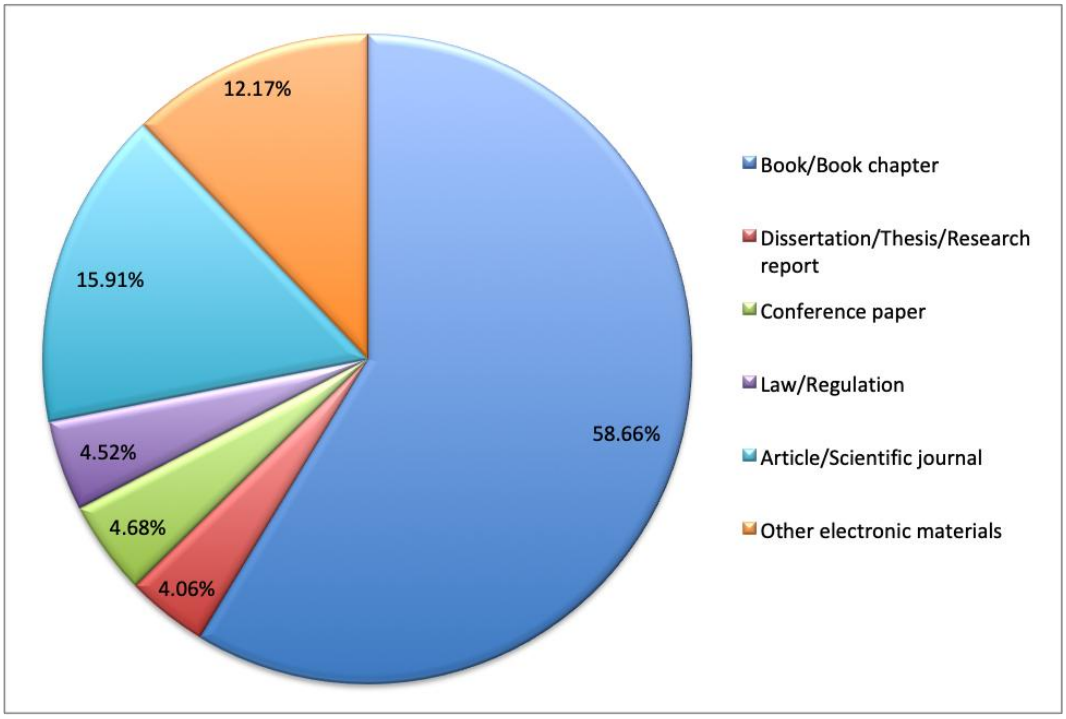
[3] Data from June 2019.

As previously mentioned, in this work we aim at analyzing the insertion of the academic production published in scientific electronic journals in the handbooks of the specialization course on Educational Technologies from UFSCar and compare it to the use of books.

4.2. Overview of references and suggested complementary materials

From the documental analysis it was possible to compile a table with the specialization course on Educational Technology from UFSCar multimedia study guides bibliographical references data (Appendix A). Figure 2 below shows the number of references per type of citation, namely: book/book chapter; dissertation/thesis/research report; conference paper; law/regulation; article/scientific journal; other electronic materials.

Figure 2 - Percentage of references per type of publication.



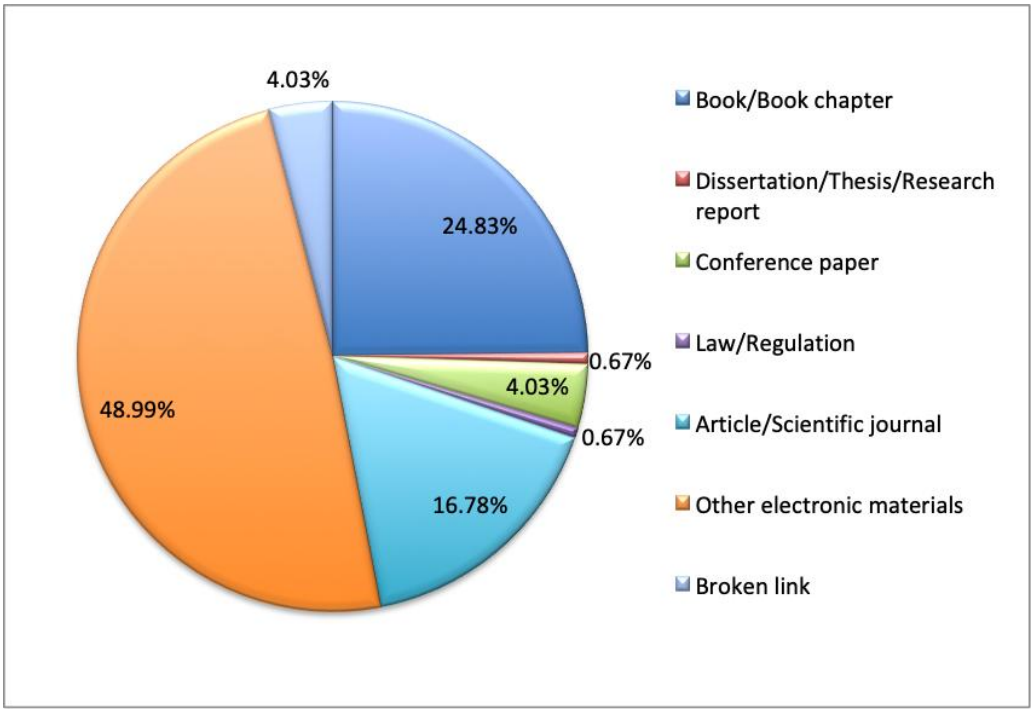
Source: the authors.

The 48 titles from the Educational Technologies Collection – Specialization Course (MILL; BEDER *et al.*, 2017) have 641 references in total. Figure 2 shows that most references are books or book chapters, totaling almost 59% of total references (376). Articles and scientific journals sum 16% (102), whereas other electronic materials[4] are 12% of total references (78). The other three reference types – dissertation/thesis/research report, conference paper, law/regulation – represent each approximately 5% of total references (26, 30 and 29 references, respectively).

[4] Other electronic materials include webpages, videos, movies, games, among other materials. Most of them are available on the internet.

The Pedagogic Proposal suggests that, “additionally, complementary texts could be indicated” (MILL; SANTIAGO; OLIVEIRA, 2018, p. 44). Taking this suggestion under consideration, it was also investigated the presence of complementary materials suggestion. These include not only text-based materials, but also webpages, videos, movies, games, among others (APPENDIX B). Figure 3 shows the same categories attributed to the references with the addition of broken link, when the suggested complementary material was a link to a non-available webpage.

Figure 3 - Percentage of complementary materials per type of publication.



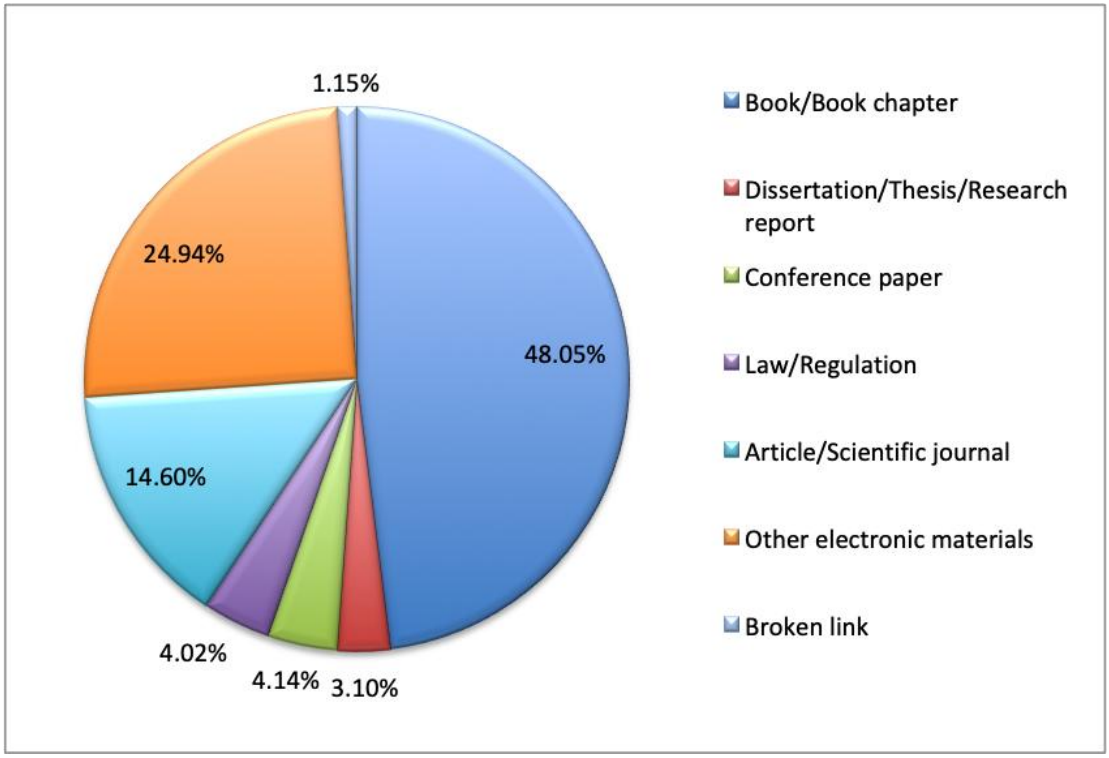
Source: the authors.

Figure 3 shows that from the 149 suggested complementary materials, the percentage of other electronic materials is way higher than in the references, corresponding to 49% of total (73). Books or book chapters are the second most suggested type of complementary material, corresponding to 25% of total (37), followed by articles and scientific journals, which counts almost 17% (25). In smaller quantity are conference papers with 4% (6) and less than 1% suggestions of dissertation/thesis/research report and law/regulation (1 suggestion of each type). Broken links represent 4% of total (6).

To complement the analyzed material it was searched in the text irregular citations, i.e., citations not listed in the references. Within this context, there were 70 citations of other electronic materials, 5 laws and 5 books.

Figure 4 shows all material indications from the 48 volumes, including referenced and non-referenced citations and complementary materials.

Figure 4 - Percentage of all cited/suggested materials per type of publication.



Source: the authors.

From the 871 material indications, books and book chapters are the most indicated, corresponding to 48% of total (418), followed by other electronic materials with 25% (217), and articles and scientific journals, corresponding to 15% (127). With less expressive numbers, conference papers, laws and regulations count 4% each (36 and 36), whereas dissertations, thesis and research reports sum 3% (27). Broken links represent 1% of total (10).

4.3. Discussion

The analysis of the multimedia study guides from the specialization course on Educational Technologies from UFSCar showed predominance of books/book chapters over other types of material (dissertation/thesis/research report; conference paper; law/regulation; articles/scientific journals; other electronic materials). In other words, the multimedia study guides were written based mostly on books.

The majority of books as reference agrees with the tendency pointed out by Packer (2011, p. 30). According to the author, humanities articles have high proportion of books citations when compared to hard sciences articles (46% and 16%, respectively). The study by Silva, Menezes and Pinheiro (2003) supports this tendency. The authors affirm that humanities researchers prefer to publish their research results in books instead of articles. On the other hand, they also indicate a tendency for humanities publications to transition from books to scientific journal articles. Still, both studies show a big discrepancy between the number of articles published in scientific journals in humanities when compared to hard sciences. Leta (2012) adds that these findings could be

justified by the number of highly qualified professionals (PhDs) being higher in hard sciences than in humanities. However, according the author, there was a substantial growth in the number of Master and PhD researchers graduated in Brazilian universities in the last years. Leta (2012, p. 51) also adds that “to be a researcher in Brazil is roughly a synonym of to be a professor/advisor in a graduate course”. Brazilian science is, therefore, completely attached to graduate programs. Hence everything affecting one will necessarily affect the other.

Other electronic materials are the majority of suggested complementary materials. As stated before, webpages, videos, movies, games and other materials mostly available on the internet compose the category other electronic materials. Although suggested by the author-docents, these complementary materials were not used as base to the multimedia study guides. They are indeed meant to complement the basic course material.

Considering all materials from citations and suggestions, articles/scientific journals are the third most indicated materials, preceded by books/book chapters and other electronic materials. This research did not analyze the articles/scientific journals presence on the internet, i.e., they could be electronic or in print. Nevertheless, according to Tenopir, Hitchcock and Pillow (2003) report on the use of electronic bibliographical sources, in 2002 80% of scientific journals had already an electronic version. Oliveira (2007) adds that in 2006/2007 92% of that same journals were published with electronic version. Following this trend, therefore, it is possible to conclude that now, more than ten years later, most scientific journals are published with electronic versions.

According to Packer (2011), Brazil has many open access scientific journals especially via SciELO. This favors the access to articles published in electronic scientific journals. The author says, however, that the number of citations the authors receive when publishing in national scientific journals is way lower than when publishing in international journals. This is valid even for Brazilian researchers with recognized high international performance (PACKER, 2011, p. 49).

The Brazilian researchers reluctance in relation to the use of articles published in electronic scientific journals – especially the national ones – could be related to the previously addressed legitimacy issue. On the other hand, it is important to stress that not using articles from scientific journals does not relate directly to the Brazilian scientific production. Righetti and Gamba (2019) show with recent data that the scientific production in Brazil had a significant growth between 2008 and 2017, especially in humanities.

The increasing number of electronic scientific journals in Brazil and worldwide (LETA, 2012; PACKER, 2011); the use of tools to guarantee the continuous legitimacy of this type of publication among the international scientific community, e.g. the impact factor (LETA, 2012; MUELLER, 2006; PACKER, 2011; OLIVEIRA, 2007); and the peer review process development (HAMES, 2012) are key factors in discussions in favor of the use of articles published in electronic scientific journals. It is urgent that Brazilian researchers incorporate the international trends on scientific knowledge legitimacy to their work. This helps guaranteeing the quality of the scientific production in Brazil and keeping the growth and integration of the country in the international scientific community (LETA, 2012; PACKER, 2011).

Oliveira (2007) stresses the importance of libraries to adapt to the current context, aiming at the proper use and production of articles published in scientific electronic journals. According to the author, libraries should offer training to researchers on the extensive and effective use of electronic scientific journals. Although Oliveira's work is not recent, this is still a relevant topic. The use of digital resources, such as computers and smartphones with access to the internet, does not necessarily means they are properly used to scientific and educational purposes.

The Pedagogic Proposal of the specialization course on Educational Technologies from UFSCar values the scientific knowledge published in electronic scientific journals. According to the proposal's authors, the multimedia study guide should contain indications of

> *three to five scientific papers as mandatory material* about the curricular component. Additionally, complementary texts could be suggested. The mandatory materials should be freely available on the internet (MILL; SANTIAGO; OLIVEIRA, 2018, p. 44, original emphasis)

The results from the documental analysis show that in several cases the Pedagogic Proposal suggestion of indicating "three to five scientific papers as mandatory material" (MILL; SANTIAGO; OLIVEIRA, 2018, p. 44) is not followed. Consequently, the obligatory presence of such materials freely available on the internet is also not accomplished. The non-attendance to these criteria directly affects the course's "open, flexible, hybrid and integrated proposal" (MILL; SANTIAGO; OLIVEIRA, 2018, p. 5). The material availability on the internet guarantees the student is able to make real use of the course's flexibility, especially in relation to the flexibility of study location.

The lack or low use of electronic materials in the multimedia study guides from the specialization course on Educational Technologies from UFSCar opposes to the course's theme, *Educational Technologies*. This problem is attenuated by the consistent presence of other electronic materials among the complementary materials. On the other hand, it is important to stress that the majority of complementary materials are not scientific publications. Therefore it does not have the academic legitimacy conferred to scientific journals.

5. Final considerations

This research aimed at analyzing the use of articles published in electronic scientific journals in the multimedia study guides from the specialization course on Educational Technologies from UFSCar in comparison to the use of print books.

To accomplish this objective, we did a bibliographical review on electronic scientific journals. In the center of this review was the legitimacy conferred to this type of material by the scientific community. Focusing on the Educational Technologies course, the multimedia study guides of all curricular components were collected. We analyzed the bibliography used in these materials, as well as the complementary materials the docents suggested. Such analysis allowed an overview of the material – with 48 volumes – regarding the number of citations/suggestions in relation to the type of material (book/book

chapter; dissertation/thesis/research report; conference paper; law/regulation; article/scientific journal; other electronic materials).

We verified a higher number of book/book chapter citations, when compared to other types of material. The second most cited type of material was other electronic material, which includes webpages, videos, movies, games, among others, being the majority available on the internet. Scientific journals hold the third position among the most cited types of materials. According to Packer (2011), Silva, Menezes and Pinheiro (2003) and Leta (2012), in humanities publications it is expected to have a higher number of citations to books, compared to other materials. This is due to several factors, including the low number of PhD professionals and their preferences regarding publication media. Oliveira (2007) adds that whereas the number of electronic scientific journals in Brazil increases, it does not reach its full potential, considering the high incentives by the Brazilian government to electronic scientific journals repositories (LETA, 2012; MUELLER, 2006; PACKER, 2011).

The wide indication of complementary materials available on the internet meets the course theme, *Educational Technologies*, with an open, flexible and integrated educational proposal. Nevertheless, if scientific journals hold legitimacy among the scientific community, the need of integration of electronic scientific journals to the course material – the multimedia study guides – is latent.

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APPENDIX A. Number of references per Title × Type of publication

Title/Type of publication	A	B	C	D	E	F	T
Aprendizagem colaborativa nas comunidades em rede	8	-	2	-	-	2	12
Acessibilidade na educação a distância	2	-	-	3	1	2	8
Ambientação e letramento digital	13	-	-	-	1	-	14
Ambientes virtuais de aprendizagem	3	-	-	-	1	-	4
Aplicações pedagógicas da internet e redes sociais	1	-	-	-	1	3	5
Aplicações pedagógicas de jogos digitais	2	1	1	-	-	2	6
Aplicações pedagógicas de mídias escritas	3	-	1	-	-	5	9
Aplicações pedagógicas do rádio	5	-	1	-	1	-	7
Aplicações pedagógicas do audiovisual	5	-	-	-	-	3	8
Avaliação em processos de aprendizagem na EaD	14	1	-	-	3	3	21
Convergências midiáticas e sociedades...	8	-	1	-	1	-	10
Design de jogos educacionais	11	-	-	-	-	-	11
Dicas de boa escrita	5	-	-	-	-	-	5
Direito digital na EaD	2	-	-	11	-	-	13
Docência virtual	18	3	-	-	9	-	30
Educação híbrida	13	-	-	-	2	3	18
Educação redes sociais e cultura digital	3	-	-	-	3	5	11
Estilos de aprendizagem na EaD	5	-	-	-	5	3	13
Ferramentas de produtividade em nuvem no contexto...	-	-	1	-	1	9	11
Flexibilidade pedagógica	7	-	-	-	2	1	10
Formação de professores	2	1	1	-	9	-	13
Gestão estratégica da educação a distância	5	1	-	-	1	-	7
Gestão organizacional	23	3	1	1	7	-	35
Gestão pedagógica	11	-	-	-	-	-	11
Informática na educação	10	4	-	-	1	-	15
Inovações tecnológicas e inovações pedagógicas	12	-	-	-	-	1	13
Integração de mídias na educação	7	-	2	-	3	-	12
Introdução à educação e tecnologias	9	-	-	-	-	3	12
Introdução à gestão da educação	11	-	-	1	8	-	20

Introdução aos jogos na educação	14	-	-	-	3	1	18
Legislação educacional	6	1	-	10	-	4	21
Linguagem cinematográfica e audiovisual no...	7	-	1	-	2	-	10
Linguagem do rádio e TV na educação	3	-	3	-	4	7	17
Linguagem, comunicação e tecnologias	11	-	-	-	5	-	16
M-learning	11	1	7	-	7	3	29
Mídias, comunicação e formação infanto-juvenil	6	-	3	1	7	1	18
Noções elementares sobre educação a distância	5	-	-	-	1	-	6
Planejamento do processo de ensino e aprendizagem	16	1	-	-	3	-	20
Planejamento e organização de animações para educação	11	2	1	-	1	3	18
Planejamento e organização de mídia audiovisual	5	-	-	-		1	6
Planejamento e organização de mídia escrita para...	14	-	-	-	1	2	17
Polidocência	5	3	-	-	1	-	9
Produção musical na educação	7	1	-	-		1	9
Robótica pedagógica	10	1	1	-	2	-	14
Sistema de tutorias e modelos de feedback	10	-	-	2	3	1	16
Tecnologia assistiva na educação	8	1	-	-		8	17
Tecnologias e sociedade	5	-	-	-	1	-	6
Webconferência e sua aplicação pedagógica	4	1	3	-	1	1	10
Total	376	26	30	29	102	78	641

A = Book/Book chapter; B = Dissertation/Thesis/Research report; C = Conference paper; D = Law/Regulation; E = Article/Scientific journal; F = Other electronic materials; T = Total.

APPENDIX B. Number of suggestion of complementary material per Title × Type of publication

Title/Type of publication	A	B	C	D	E	F	G	T
Aprendizagem colaborativa nas...	3	-	-	-	-	-	-	3
Acessibilidade na educação a distância	-	-	-	-	-	6	1	7
Ambientação e letramento digital	-	-	-	-	-	2	1	3
Ambientes virtuais de aprendizagem	-	-	-	-	-	-	-	0
Aplicações pedagógicas da internet e...	-	-	-	-	-	-	-	0
Aplicações pedagógicas de jogos digitais	2	-	-	-	2	1	-	5

Aplicações pedagógicas de mídias escritas	2	-	-	-	7	-	1	10
Aplicações pedagógicas do rádio	-	-	-	-	-	5	-	5
Aplicações pedagógicas do audiovisual	-	-	-	-	-	13	-	13
Avaliação em processos de aprendizagem...	-	-	-	-	-	5	-	5
Convergências midiáticas e sociedades...	2	-	1	-	-	-	1	4
Design de jogos educacionais	4	-	2	-	3	-	-	9
Dicas de boa escrita	-	-	-	-	-	-	-	0
Direito digital na EaD	-	-	-	-	-	-	-	0
Docência virtual	-	-	-	-	-	-	-	0
Educação híbrida	-	-	-	-	-	-	-	0
Educação redes sociais e cultura digital	-	-	-	-	-	-	-	0
Estilos de aprendizagem na EaD	3	-	-	-	4	1	-	8
Ferramentas de produtividade em nuvem...	-	-	-	-	-	-	-	0
Flexibilidade pedagógica	-	-	-	-	-	-	-	0
Formação de professores	4	-	-	-	4	-	-	8
Gestão estratégica da educação a distância	-	-	-	-	-	1	-	1
Gestão organizacional	-	-	-	-	-	-	-	0
Gestão pedagógica	-	-	-	-	-	-	-	0
Informática na educação	2	-	-	-	-	3	-	5
Inovações tecnológicas e inovações...	5	-	-	1	-	-	-	6
Integração de mídias na educação	-	-	-	-	-	-	-	0
Introdução à educação e tecnologias	1	-	-	-	-	3	-	4
Introdução à gestão da educação	-	-	-	-	-	-	-	0
Introdução aos jogos na educação	-	-	-	-	3	4	-	7
Legislação educacional	-	-	-	-	-	5	-	5
Linguagem cinematográfica e audiovisual...	-	-	-	-	-	-	-	0
Linguagem do rádio e TV na educação	1	-	-	-	1	2	-	4
Linguagem, comunicação e tecnologias	-	-	-	-	-	-	-	0
M-learning	-	-	-	-	-	-	-	0
Mídias, comunicação e formação...	1	-	-	-	-	3	-	4
Noções elementares sobre educação a...	-	-	-	-	-	-	-	0

Planejamento do processo de ensino e...	-	-	-	-	-	-	-	0
Planejamento e organização de animações...	-	-	-	-	-	-	-	0
Planejamento e organização de mídia...	-	-	-	-	-	-	-	0
Planejamento e organização de mídia...	-	-	-	-	-	-	-	0
Polidocência	-	-	-	-	-	-	-	0
Produção musical na educação	-	-	-	-	-	-	-	0
Robótica pedagógica	3	-	-	-	-	6	-	9
Sistema de tutorias e modelos de feedback	-	-	1	-	1	1	-	3
Tecnologia assistiva na educação	-	-	-	-	-	6	2	8
Tecnologias e sociedade	-	-	-	-	-	-	-	0
Webconferência e sua aplicação pedagógica	4	1	2	-	-	6	-	13
Total	37	1	6	1	25	73	6	149

A = Book/Book chapter; B = Dissertation/Thesis/Research report; C = Conference paper; D = Law/Regulation; E = Article/Scientific journal; F = Other electronic materials; G = Broken link; T = Total.

Author contributions

Author 1: Conception, analysis, interpretation of data, final revision.
Author 2: Contributed to conception and final revision, supervision.

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