



Beyond quality metrics: defying journal rankings as the philosopher’s stone of mathematics education research

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Abstract

In recent years, the field of mathematics education has witnessed the emergence of several journal rankings. Within these rankings, Ibero-American journals have had little—to almost no—presence. This raises awareness on the current state of journal indexes and on what these indexes do and how they have been used in constituting sites of exclusion within the mathematics education community. We contend that ranking systems are perceived as the philosopher’s stone of academia, in the sense that they have the ability to convert any material (an article, a journal, the academic production of a scholar) into a precious material within the academic world. This alchemic move not only exacerbates exclusion, but also configures a point system that constitutes places for enjoyment and fetishistic disavowal within researchers. Thus, we want to challenge the assumption that mainstream journal rankings are able to accurately reflect the quality, impact, and reputation of mathematics education journals by taking as “empirical data” the Ibero-American journals in the field of mathematics education. In problematizing journal ranking effects in the production, dissemination, and socialization of knowledge, we seek to open a discussion regarding the economic-political dynamics that govern publishing practices in mathematics education and that are entangled in the production of knowledge in our discipline.

Keywords Journal indexing · Ranking effects · Exclusion · Enjoyment · Fetishistic disavowal

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1 Introduction

During recent years, the fields of science and mathematics education have witnessed the emergence of several journal rankings (see Toerner & Arzarello, 2012; Towns & Kraft, 2011; Williams & Leatham, 2017). The arguments provided for producing these rankings are usually connected to the role that academic journals have in measuring the quality of research, and in the promotion and institutional development of scholars—for example, when the quality and the quantity of publications are taken as scholars' productivity¹ indicator (Hsu, Tsai, & Li, 2015). Other claims argue that “quality research” becomes an indispensable part of the decision-making process related to hiring, retaining, promoting, and allocating resources to academics in their institutions (Williams & Leatham, 2017), and thus, the journals where scholars publish their work are one of the main forms of measuring the quality of their research. All in all, these ranking systems, that are considered to be quality measurements in academia, have changed the way in which scholars decide where to publish their work, and how they perceive and read journals.

We contend that these ranking systems are perceived as the philosopher's stone of academia. Such contention enables us to problematize the added value given not only to journals and the papers published in such journals, but to scholars as well; it also enables to problematize the naturalization of certain elements in understanding what entails the dissemination of invaluable knowledge and its consequences in academia. We want to challenge the assumption that mainstream journal rankings are able to accurately reflect the quality, impact, and reputation of mathematics education journals. In doing so, we gather data on Ibero-American journals in the field of mathematics education to see if *'the'* rankings capture the productivity of the region. The purpose of this article is not only to contribute to the visibility of a variety of Ibero-American journals in the field of mathematics education, but also to take a critical position about the value given to journal rankings and their effects on researchers' practices when looking at these rankings as the philosopher's stone. Therefore, this article becomes an effort to argue on how the rankings have been entangled with economic and political aspects of academia and how these rankings are and have been constituting a space of exclusion for certain social groups. The phenomenon of exclusion in academia, as widely discussed by several scholars, is manifested through different practices, values, and beliefs that are quite prevalent in our field (see Ernest, 2009; Meaney, 2013).

Quality metrics have mutated into means of segregation, not only in terms of publishing language limitations but also in the value given to non-English literature. Meaney (2013) highlights the positioning of English as the lingua franca of mathematics education research practices, prompting “monoculturalism” (Meaney, 2013, p. 65). Within such monoculturalism, there is a “seemingly ready acceptance [...] of the proposition that such [non-English] literature may be ignored because it will be derivative rather than innovative and that its quality will be poor, and the findings will therefore be unimportant” (Stolerman & Stenius, 2008, p. 1).

¹ By productivity we refer to the naturalized move within the academic life of scholars and of the region as a whole. Productivity of scholars entails that the highest number of publications is desirable and that the journals in which those publications are submitted are considered only if these are top journals. Productivity, in this sense, would seem to normalize day-to-day practices of researchers and to evaluate their performance. Regarding the productivity of the region, we believe that this may not be represented by top rankings. This is one of our main concerns since there are only a couple of Ibero-American journals in the rankings, whereas it is possible to see how active a region is by the increasing number of journals and the incorporation of these journals in different indexes—a phenomenon that apparently has gone unnoticed.

Nivens and Otten (2017) argue that the journal metric impact factor (Web of Science's Impact Factor) excludes significant portions of dissemination venues for certain disciplines, such as mathematics education. The representativeness of Impact Factor rankings (mainly dominated by publications in English) has attracted special interest in scientific communities, in specific in non-English-speaking communities (González-Alcaide, Valderrama-Zurián, & Aleixandre-Benavent, 2012). And thus, the mapping of the vast number of Ibero-American journals on mathematics education helps in recognizing their diversity and characteristics, and to make them visible to other scholars. It is an effort to nurture diversity in academic publishing within the mathematics education research community. As stated by Phakeng (2017), “[d]iversity in academic publishing is about recognizing the various voices, identities and/or cultures that are usually silenced by a narrative of tolerance, which signifies keeping intact the hierarchies of what is considered hegemonic” (p. 19). Such diversity is one of the main characteristics that are to be found within the Ibero-American mathematics education community, as it coexists with its own theoretical and methodological references and stances, as well as its own problems and research interests. The data on Ibero-American journals were collected in two steps: first by locating the well-known journals according to Ibero-American mathematics educators; and second by gathering all Ibero-American journals using three approaches. The data gathered in both steps were sorted in two different lists. The first one—from now on, *the ranked list*—helps in locating the journals that are of more relevance for Ibero-American scholars. The second—from now on, *the comprehensive list*—allows to challenge the little presence of Ibero-American journals in the field of mathematics education from the lists of taken-as-quality journals. Eight being (in Nivens & Otten, 2017) the maximum number of journals we encountered in our quest for searching the “quality journals” of our region, it becomes vital for the sake of our work, as researchers, to detach from this trend of disregarding Ibero-American outlets from the rankings. Thus, both lists are our means to stand against what we recognize as an exclusionary trend that obscures the presence of the journals of one of the world's largest mathematics education communities in the international landscape of mathematics education.

2 Method

There is a variety of methods to collect the type of data needed for this problematization, within which two types of approaches are predominant: opinion-based studies, based on experts' opinions (see Toerner & Arzarello, 2012); and citation-based studies, based on citation counts (see Nivens & Otten, 2017; Williams & Leatham, 2017)—although some researchers have their reservations regarding both approaches. On the one side, they have pointed out the disadvantages of using opinion-based studies as a reliable method of inquiry (e.g., Haensly, Hodges, & Davenport, 2008; Williams & Leatham, 2017). These disadvantages ranged from the potential discrepancy among the interviewees on the notion of quality of a journal to the biases that could exist when the consulted experts are asked to rank or classify journals. Most of the arguments on the conflictive aspects of this type of approach target the risk of subjective answers. For example, there is the danger of privileging the journals to whose editorial committees the interviewees belong or the journals in which they most frequently publish (Williams & Leatham, 2017). On the other side, there are the disadvantages of using citation-based studies. These do not only concern subjective opinions of consulted experts, but also other types of decisions made by scholars while doing their research, for example, the

multiplicity of reasons why a researcher decides—or not—to cite certain sources. These reasons might include citing only papers published in their mother tongue, citing “classical” papers on a particular topic, using self-citations, among others. More than a measure of quality, citation-based studies could be considered a measure of influence or visibility. Here, our strategy in overcoming the inherent drawbacks presented by these two approaches is to implement a combination of both. We compiled and complemented the results obtained through the aforementioned approaches, opinion-based and citation-based studies. The compilation consisted of gathering all the information collected by both methods into one list—the ranked list. The complementation of this ranked list—the comprehensive list—consisted of an online search of journals that were not retrieved through both methods. We use search engines from Ibero-American indexes—such as Qualis—and our own knowledge of Ibero-American journals.

2.1 Gathering opinions

Due to its potential for gathering information from large audiences, we decided to use a questionnaire to collect the opinions of mathematics educators about Ibero-American journals. Once we developed an initial set of possible questions, we conducted a pilot test to determine if the questions were clear to the potential interviewees and if the answers provided useful information for the purposes of this research. The pilot test was carried out with a group of ten mathematics educators—doctoral students and researchers. We asked the mathematics educators to answer the following: which Ibero-American journals, in the field of mathematics education, do you consider to be quality journals²? The survey, via Google Forms, was carried out until the end of March 2014. A total of 462 mathematics educators were invited, via e-mail, to anonymously participate in the study; 115 completed the questionnaire. The average age was 48 years, and there were 57 women and 58 men. The affiliation institutions were located in Argentina, Brazil, Chile, Colombia, Costa Rica, Spain, Mexico, Peru, Portugal, UK, USA, Uruguay, and Venezuela.

2.1.1 Selecting the participants in the opinion-based study

The group of mathematics educators surveyed was selected by following three criteria. First, we targeted the leaders of three major Ibero-American organizations in mathematics education (Hodgson, Rogers, Lerman, & Lim-Teo, 2013; Ruiz, 2013): Federación Iberoamericana de Sociedades de Educación Matemática (FISEM), Comité Latinoamericano de Matemática Educativa (CLAME), and Comité Interamericano de Educación Matemática (CIAEM). These organizations bring together a large part of the Ibero-American mathematics education community. In addition, such organizations periodically organize academic conferences and publish some of the Ibero-American journals that are currently in circulation. This criterion enabled locating 21 mathematics educators.

² Quality is a transversal issue in this paper. Although quality was not defined in the questionnaire, we asked by quality journals in order to delimit the consulted experts’ answers. Therefore, in this paper, quality is taken as a subjective matter in function of what each consulted expert understands by quality journals. Moreover, in mathematics education research, there are some studies concerned with quality in mathematics education—for example, Williams and Leatham (2017) and Nivens and Otten (2017)—in which is possible to find some understanding of quality.

Second, we targeted the leaders of national and regional mathematics education organizations from Ibero-America. These national and regional organizations were located by identifying organizations associated with FISEM, CLAME, and CIAEM, such as Red de Educación Matemática de América Central y el Caribe and Asociación Peruana de Investigación en Educación Matemática, among many others. In addition, an Internet search engine was used to introduce key phrases such as “federación de educación matemática,” “asociación de educación matemática,” or “associação de educação matemática.” We also included the name of each Ibero-American country (e.g., “associação de educação matemática do Portugal”). Once the organizations were located, the three highest positions—the leaders—within those organizations were included. As a result of this process, 27 leaders of 13 mathematics education organizations were identified. This counting excludes mathematics educators identified in the previous stage.

Third, the survey targeted members of the editorial boards and scientific committees of the mathematics education journals—and science education journals that publish mathematics education articles—included in the Social Sciences Citation Index (SSCI) during 2013, as well as the authors who published in those journals during the period 2011–2013. The journals used as reference were *Boletim de Educação Matemática (BOLEMA)*, *Enseñanza de las Ciencias, Perfiles Educativos*, *Revista Electrónica de Investigación Educativa*, *Revista Latinoamericana de Investigación en Matemática Educativa (RELIME)*, and *Revista Mexicana de Investigación Educativa*. Through this criterion, 414 mathematics educators were identified and combined with the lists resulting from the prior criteria.

2.1.2 Surveyed opinions

We retrieved 115 answers; however, 10 of them were discarded due to the inconclusive nature of the responses, such as “all Ibero-American journals are quality journals,” “none Ibero-American journal is a quality journal,” or “I don’t have the knowledge to answer this question.” Within the remaining 105 responses, 94 Ibero-American journals were mentioned (3 journals were excluded as a next step because they were not mathematics educational journals). These journals were sorted according to their frequency—how many times a journal was mentioned. Table 1 shows the 10 most mentioned Ibero-American journals that explicitly state mathematics education as their scope.

Table 1 List of the 10 most mentioned journals in the opinion-based study

| Frequency | Journal |
|-----------|--|
| 70 | <i>Boletim de Educação Matemática (BOLEMA)</i> |
| 60 | <i>Revista Latinoamericana de Investigación en Matemática Educativa (RELIME)</i> |
| 38 | <i>Educación Matemática</i> |
| 18 | <i>QUADRANTE. Revista de Investigación em Educação Matemática</i> |
| 17 | <i>UNIÓN. Revista Iberoamericana de Educación Matemática</i> |
| 17 | <i>ZETETIKÉ. Revista de Educação Matemática</i> |
| 9 | <i>Educación Matemática Pesquisa</i> |
| 7 | <i>Acta Scientiae</i> |
| 7 | <i>Avances de Investigación en Educación Matemática (AIEM)</i> |
| 7 | <i>Revista Latinoamericana de Etnomatemática (RevLatEm)</i> |

2.2 The citation flow

We proceeded with this inquiry by following an analytical move inspired by Williams and Leatham (2017) and by Nivens and Otten's (2017) citation-based studies. A three-step strategy was adopted in analyzing the citation flow of Ibero-American journals in the field of mathematics education. First, we analyzed the citation flow of the articles published in the top two Ibero-American journals according to the opinion-based study (see Table 1). Second, we analyzed the citation flow of the top two Ibero-American journals from the previous step. Third, we narrowed the resulting list—the product of the two previous steps—in order to include solely Ibero-American mathematics education journals.

2.2.1 First step

Similar to Williams and Leatham's (2017) study, we started with the selection of two rated-as-top journals. We determined these journals by using the results gathered in the opinion-based study: *BOLEMA* and *RELIME*. Both of these journals are thought to be of high quality by mathematics educators in the region; also, both of them have gained international visibility. For example, *BOLEMA* and *RELIME* are included in the list of 69 mathematics education journals in the study developed by Nivens and Otten (2017). Furthermore, both appear in top indexes, such as Scopus (*BOLEMA*) and Web of Science (*RELIME*).

As in Williams and Leatham's (2017) strategy, we examined all the articles published in *BOLEMA* and *RELIME* during a period of 4 years, from 2014 to 2017—12 issues of *BOLEMA*

Table 2 Top 5 places of the citation-based study

| Place | First step | | Second step | | Third step | |
|-------|------------------|--|------------------|--|------------------|--|
| | No. of citations | Journal | No. of citations | Journal | No. of citations | Journal |
| 1 | 255 | <i>Educational Studies in Mathematics</i> | 388 | <i>Educational Studies in Mathematics</i> | 286 | <i>Boletim de Educação Matemática (BOLEMA)</i> |
| 2 | 233 | <i>Boletim de Educação Matemática (BOLEMA)</i> | 286 | <i>Boletim de Educação Matemática (BOLEMA)</i> | 256 | <i>Revista Latinoamericana de Investigación en Matemática Educativa (RELIME)</i> |
| 3 | 168 | <i>Revista Latinoamericana de Investigación en Matemática Educativa (RELIME)</i> | 256 | <i>Revista Latinoamericana de Investigación en Matemática Educativa (RELIME)</i> | 134 | <i>Revista Latinoamericana de Etnomatemática (RevLatEm)</i> |
| 4 | 122 | <i>Journal for Research in Mathematics Education</i> | 187 | <i>Recherches en Didactique des Mathématiques</i> | 133 | <i>Educación Matemática</i> |
| 5 | 116 | <i>ZDM Mathematics Education</i> | 178 | <i>ZDM Mathematics Education</i> | 48 | <i>ZETETIKÉ. Revista de Educação Matemática</i> |

(288 articles) and 14 issues of *RELIME* (83 articles)—which totaled 371 articles. Once the articles were gathered, we tracked all the references. In this process, each article was manually analyzed by selecting, from the reference list, only references to publications in journals, without distinctions of self-citation, region, language, and journal indexation, among others. References to published books, book chapters, proceedings, etc. were excluded. We sorted the resulting list of journals according to their frequency of citations to identify the next two most cited journals. The first column of Table 2 shows the results of this first step of the citation-based study, for the top 5 places.

2.2.2 Second step

From the resulting list of journals in the first step, we identified the journals with the highest number of citations and selected the two most cited Ibero-American journals in mathematics education, i.e., *Educación Matemática (EM)* and *Revista Latinoamericana de Etnomatemática (RevLatEm)*, and repeated the same strategy. We took all the articles published by *EM* and *RevLatEm* during a period of 4 years, from 2014 to 2017—13 issues of *EM* (107 articles) and 12 issues of *RevLatEm* (123 articles)—which totaled 230 articles. The articles were manually analyzed as in the previous step. Following this strategy, we sorted the resulting list of journals according to the frequency of citations and gathered all data to produce a list of the most cited journals—in *RELIME*, *BOLEMA*, *EM*, and *RevLatEm*—sorted according to their frequency of citations. The second column of Table 2 shows the results of the citation-based study, from this second step, for the top 5 places.

2.2.3 Third step

The articles included in step 2 totaled 601 articles. In order to narrow down the list, from all the references cited in these sources, we selected only Ibero-American journals that explicitly stated mathematics education as their scope. Journals publishing mathematics education papers but with a broader scope—such as *Enseñanza de las Ciencias*—were excluded. The third column of Table 2 shows the first 5 places of the most cited Ibero-American journals in mathematics education.

3 Compiled data

3.1 A ranked list

A ranked list was obtained by combining the data from both methods. The resulting outcome was a list of journals, sorted according to the frequency of outputs. Both methods provided a sample of 31 journals and 71 journals respectively (25 journals appeared in both lists). We calculated the percentage of each journal's frequency in each one of the ranked lists, and we added the resulting percentages to obtain a final list of 67 Ibero-American mathematics education journals. Table 3 shows a list of the first 10 places, including information about their year of first publication, the country in which the journal is based, the type of indexations, open access, and languages accepted for publication.

Table 3 Ranked list of the top 10 Ibero-American mathematics education journals

| Ranking | Journal | First publication | Country | Indexation | Open access | Language |
|---------|--|-------------------|----------|--|-------------|--|
| 1 | <i>Boletim de Educação Matemática (BOLEMA)</i> | 1985 | Brazil | Latindex Redalyc Scopus SciELO Qualis | Yes | Portuguese Spanish English |
| 2 | <i>Revista Latinoamericana de Investigación en Matemática Educativa (RELIME)</i> | 1997 | Mexico | Latindex Redalyc Scopus SciELO Qualis Web of Science (SSCI) | Yes | Portuguese Spanish English French |
| 3 | <i>Educación Matemática</i> | 1989 | Mexico | Latindex Redalyc Scopus SciELO Qualis | Yes | Portuguese Spanish English French |
| 4 | <i>Revista Latinoamericana de Etmomatemática</i> | 2008 | Colombia | Latindex Redalyc | Yes | Portuguese Spanish English French |
| 5 | <i>ZETETIKÉ. Revista de Educação Matemática</i> | 1993 | Brazil | Latindex Qualis | Yes | Portuguese Spanish English |
| 6 | <i>UNIÓN. Revista Iberoamericana de Educación Matemática</i> | 2005 | FISEM | Latindex | Yes | Portuguese Spanish |
| 7 | <i>QUADRANTE. Revista de Investigação em Educação Matemática</i> | 1993 | Portugal | Latindex | Yes | Portuguese Spanish English French |
| 8 | <i>Educação Matemática Pesquisa</i> | 1999 | Brazil | Latindex Qualis | Yes | Portuguese |
| 9 | <i>UNO. Revista de Didáctica de las Matemáticas</i> | 1994 | Spain | Latindex | No | Spanish |
| 10 | <i>NÚMEROS. Revista de Didáctica de las Matemáticas</i> | 1978 | Spain | Latindex | Yes | Spanish |

It is important to state that we are NOT interested in asserting which Ibero-American journal is better than the others; instead, what Table 3 expresses is which journals are the most cited and the most mentioned among the specialists interviewed. This ranked list reveals the wide range of journals that have been active and visible in Ibero-America, at least during 2014–2017. It also exhibits the preponderance of two well-known journals of the region: *BOLEMA* and *RELIME*. This could be influenced by the selection of journals in the citation-based study, although it is not the case in the opinion-based study, which had these two journals at the top as well. One possible explanation could be that journals such as *BOLEMA*, *RELIME*, and *EM* are included in the desired top international indexes—Scopus and Web of Science. And thus, contributing to the argument made at the beginning, journals' indexations become an indisputable measuring for quality. Journal rankings appear as one of the key elements in the production and dissemination of knowledge, and thus continue the metaphor of rankings as the philosopher's stone. For example, alongside *BOLEMA*, *RELIME*, and *EM*,

there is also a preponderance of well-indexed international journals—i.e., *Educational Studies in Mathematics* and *ZDM Mathematics Education*—as valuable platforms to disseminate research in the region (see Table 2). Furthermore, Table 3 shows that the first four places of the ranked list are occupied by journals indexed in Redalyc and the first three places are indexed in SciELO and Scopus. Although there are exceptions, for example *Revista Colombiana de Estadística*—indexed in SciELO and Scopus—and *Boletín de Estadística e Investigación Operativa (BEIO)*—indexed in Scopus—share 38th place on the ranked list. Regarding Web of Science, journals included in this index occupy different places: 2nd, 12th, 18th, 19th, and 38th, but most of them were recently indexed in Emerging Sources Citation Index (ESCI), which is not yet a valid index in many places (see for example CONICYT regulations in Chile).

The ranked list becomes a celebration of diversity regarding languages for publication. Most journals at the top publish articles in four languages—Portuguese, Spanish, English, and French. The ranked list also shows how this community opens different possibilities for the dissemination of research, since most journals are relatively new. Thirty of the 78 journals listed have been released between 2000 and 2019 (see supplementary material). From the top 10, the oldest journal is *NÚMEROS. Revista de Didáctica de las Matemáticas* from Spain, released in 1978, and the most recent ones are *UNIÓN. Revista Iberoamericana de Educación Matemática*, released in 2005, and *Revista Latinoamericana de Etnomatemática (RevLatEm)*, released in 2008. However, there is an unexpected centralization of outlets, with the first places of the ranked list occupied mainly by journals based in Brazil and Spain. This might be linked to policy regulations from both countries on the economic value of scientific production (see Strehl, Calabró, Souza, & Amaral, 2016).

3.2 A comprehensive list

A comprehensive list³ of Ibero-American mathematics education journals was obtained by compiling the gathered data and complementing it with, on the one hand, the search engines from the indexes Qualis, Latindex, Redalyc, SciELO, Scopus, and Web of Science. In order to locate other journals, the indexes' search bars were used for entering combinations of keywords in English, Spanish, and Portuguese, such as “mathematics education” and “mathematics teacher.” The list was also complemented with our own knowledge of journals that did not appear through the previous methods.

The comprehensive list is composed of 91 journals. Sixty journals are included in one or more indexes. As in the previous list, one of the main characteristics of this corpus of journals is their openness in the languages of publication: submitted manuscripts can be written—in the majority of cases—in Spanish (65 journals), Portuguese (51 journals), and (37 journals) English (as well as in Catalan (2 journals), French (13 journals), and other languages (2 journals)). However, most papers are published in the official language of the country where the journal resides. Forty-one journals promote the publication in a second, third, or fourth language. Thirty-seven journals promote the publication in English and 6 of these have English

³ We are aware that this comprehensive list cannot be exhaustive. This is so because there may be journals that were not detected through the method that we deployed, but also because the production of journals in Ibero-America seems to be in a state of effervescence where new journals constantly appear. For instance, during the reviewing process of this manuscript, we identified another five Ibero-American journals of mathematics education, three of which were created during the years 2018 and 2019. These five titles are included at the end of the comprehensive list.

Table 4 First publication year, by country

| | Argentina | Brazil | Chile | Colombia | Costa Rica | Mexico | Portugal | Spain | Venezuela | Undefined | Total of journals |
|-------------------|-----------|--------|-------|----------|------------|--------|----------|-------|-----------|-----------|-------------------|
| 2010–present | | 22 | 1 | 1 | | 3 | | 5 | | | 32 |
| 2000–2009 | 1 | 8 | | 2 | 2 | | 1 | 3 | 1 | 1 | 19 |
| 1990–1999 | 1 | 7 | 1 | 1 | | 1 | | 6 | 1 | | 18 |
| 1980–1989 | 1 | 3 | 1 | 2 | | 2 | 2 | 4 | | | 15 |
| Before 1979 | | 1 | | 2 | | | | 4 | | | 7 |
| Total of journals | 3 | 41 | 3 | 8 | 2 | 6 | 3 | 22 | 2 | 1 | 91 |

as their first language, for example, *Jornal Internacional de Estudos em Educação Matemática*.

The majority of journals in the list are open access—84 out of 91 journals—and from diverse countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Portugal, Spain, and Venezuela. From the data retrieved, Brazil and Spain are the countries with the greatest number of journals, 41 and 22 journals respectively. Table 4 reports the growing numbers of journals in the region: 51 out of 91 journals have been released since 2000, and 30 of these belong to Brazil.

4 Defying journal rankings as the philosopher's stone

When journal rankings are taken to be the philosopher's stone able to turn any metal into pure gold, research becomes a site for accountability and exclusion. “[I]deology operates at the local level where individuals chose to adopt specific practices, such as making research sound as though it comes from an English-speaking country” (Meaney, 2013, p. 67). The gathered data on Ibero-American journals contributes to the development and impulse of centrifugal forces in the academic publishing landscape of mathematics education research (Geiger & Straesser, 2015). Both the ranked list and the comprehensive list have the potential to broaden our perspective on the heterogeneity and richness of ideas that constitute the Ibero-American community of mathematics educators. However, the preference for articles written in English, as previously mentioned, is prevalent and far from innocent. Meaney (2013, p. 65) goes even further in problematizing such monocultural vibes in the field of mathematics education by asking “[a]re we colluding not just in our own oppression [...] but in that of others whose voices are reduced or removed when they are forced to use English?”

Not only do Ibero-American journals show a clear position on language, but there is an engagement with the community as well, embodied in the inclusiveness of publishing languages. Such engagement can be seen as an attempt to defy the current status quo of academia. Ibero-American journals' publication policies reflect a level of openness and inclusion of the Ibero-American community of mathematics educators, and favor interaction with researchers and communities from outside the region. Also, these Ibero-American journals show a commitment towards open access. More than 90% of the Ibero-American journals currently in circulation are accessible to all and free to share. This aligns with recent calls to help convert open access to the new default for education research (e.g., Roehrig, Soper, Cox, & Colvin, 2018). Despite these characteristics, Ibero-American journals not only have difficulties to be included in international rankings and indexes, but also find obstacles to be acknowledged as legitimate sources of knowledge production. In this regard, indexed journals become an agent that promotes the development and dissemination of certain theoretical ideas, methodological stances, and specific contributions within the field of mathematics education. This phenomenon can be understood as the result of a network of forces, decisions, and interests, as well as the consequence of a system of reasons that circumscribes and determines what we say and what is considered to be legitimate knowledge. As Meaney (2013, p. 72) contends, “universities are conceptualised as businesses, which then puts pressure on research to be considered relevant to this business' market [...] The product at the centre of universities' business is knowledge, putting it firmly into what has been described as the knowledge economy”.

Such a business' market conceptualization contributes to the increasingly dominant vision across Ibero-America—at the institutional and at the individual levels—that the quality of a journal and the articles it publishes depends on its inclusion in international indexes such as Scopus, but particularly Web of Science (e.g., Garnica, 2013). Indexing has emerged as a control mechanism to which not only journals are subjected, but that also profoundly affects the working conditions of scholars and even shapes the knowledge production in mathematics education, which favors a certain homogeneity in the field. It seems that the publication of a paper is more a matter of marketing than a matter of research, knowledge production, or dissemination. The inclusion of a journal in international indexes represents the strengthening of a point system together with the delineation of quality standards.

5 Alchemy in the production of knowledge: *a place for enjoyment*

Ibero-American journals have shown diverse characteristics that could make possible their international positioning, as well as to be considered competitive in the international arena, whether in the regularity of their publications, in their endeavor to be included in international indexes, or in their openness regarding languages of publication. But these characteristics are not a product of journals' naïve efforts; rather, these have been naturalized taken-as-necessary moves to remain part of academic life. For example, Strehl et al. (2016) have shown how papers published in regional Brazilian journals have a lower impact than papers published in international journals, even if these use the current lingua franca of academia: English. In this light, the survival of journals is in function of their visibility as an alchemic move by using the philosopher's stone. Regional (Ibero-American) journals need to strive for the precious visibility gained with highly rated indexation. This translates into the more visibility for the journal, the more chances of being taken into consideration as a possible publication outlet and of being included in those desired indexes. As an exercise, we reviewed the websites of the top 10 journals from the ranked list and the journals indexed in Scopus and Web of Science (WoS)—excluding ESCI—from the comprehensive list. From this review, it is possible to notice how the indexing becomes a powerful element in advertising the journals' quality, given that the websites display their indexing either on the front page or in the navigation bar, as medals proudly gained. Some research practices have been naturalized as common aspects of living an academic life, such as aiming to publish in high-ranked journals. In some cases, this becomes a tendency, bordering on obsession, for submitting manuscripts only in WoS- and Scopus-indexed journals to keep a job, to apply to external funding, or to obtain certain benefits. Pais (2014, p. 1090) refers to this phenomenon as enjoyment, in asserting that “[w]e can risk saying that what researchers enjoy is university credit, an expression more and more in tune with the current functioning of academic life.” And, therefore, the current point system of academia comes as a place for enjoyment and the epitome of an economic system intertwined with research in the field of mathematics education. He continues by adding that “terms such as ‘knowledge production’, ‘quotations index’ and ‘number of publications’ dictate the overriding goals of a whole swathe of social, cultural and intellectual activities that can be understood and valued in other terms” (p. 1090). The bordering-on-obsession tendency as a place for enjoyment translates into only consuming and pursuing to be published in the high-ranked journals.

Here, it is plausible to assert that researchers' enjoyment jeopardizes the circulation and visibility (survival) of all the not-so-high-ranked journals, aligning with the detriment of those not-yet-indexed journals or those not-so-high-ranked journals. This is due to how rankings and

impact factor are produced. If researchers keep focusing their scholarship only aspiring to the ranked journals, if they keep sharing, citing articles, and perceiving only high-ranked journals as the gold obtained by the alchemic moves of academia, regional journals will remain excluded from what is taken-as-quality outlets for the dissemination of knowledge. However, researchers keep attached to the ideal of collecting points for their own pleasure and promotion of their work. And institutions keep looking at the collected points as a valid source of information for assessing how productive a researcher is. It might be innocent to think that publications are made solely for trajectory and not because of the economic and politic entanglements in the production of scientific knowledge and because of the benefits that are to be obtained by academic achievements.

Building on Pais (2014), we could ask what do researchers enjoy that keeps them attached to the bounds of academic publishing in mathematics education? Could it be that the system points unfolded by the indexation of journals determine the “academic caste” of researchers? Following the idea of enjoyment, there is something more attractive for scholars that keeps them attached to what they know is wrong, namely, taking journal rankings as the philosopher’s stone and aiming at a process of alchemia of their own work. And so, academic practices mutate from enjoyment to fetishism.

6 Alchemy in the production of knowledge: *fetishistic disavowal of the academic life*

A place for enjoyment is when researchers keep doing what they do despite knowing how ranking systems are produced. As mentioned before, there is a whole economic entanglement in positioning journal rankings as the cornerstone of quality—a similar phenomenon could be seen with large-scale assessments in school. It is not unknown that some journals, not only from the field of mathematics education, indexed in the rankings, charge either for submitting and publishing a manuscript, or for granting access to a published paper. And, therefore, part of academic research funding needs to be considered for those possible expenses. In this context, publishing becomes a competitive market. Journals that are not indexed in the rankings have less chance of obtaining scholars’ paying fees than high-ranked journals. In order to survive, these journals have no other option but to become open access—as seen in the collected data, the majority of Ibero-American journals are open access.

According to Pais (2014), building on Žižek (2008), scholars perform a fetishistic disavowal. In other words, researchers acknowledge how academia works—i.e., points gained by high-ranked journals—but there is a disavowal of what academic practices do to not-high-ranked and regional journals. In Pais’ (2014, p. 1090) words, “one knows, but one does not really believe what one knows, and thus keeps acting as if one does not know.” The fetishistic disavowal entails the naturalization of certain practices as part of academic life. It is known that some institutions offer vouchers (many times called “incentives”) when researchers publish their work in journals with some specific indexations. It is also known that novel researchers struggle with not having a good enough curriculum vitae (in terms of publications in well-indexed journals) to get hired, to gain external funding, or to obtain financial support for attending academic conferences.

When it comes to journals, the naturalized practices translate into recognizing certain elements as key in pursuing visibility and, therefore, higher indexation. Despite the vast diversity of the Ibero-American research community, political decisions are made to privilege

some aspects for positioning the journal in the international arena. For instance, a fetishistic disavowal entails the aspirational desire of writing and being published in English to prompt a wider visibility of scholars' research and, therefore, the visibility of such journals. No Ibero-American countries have English as a first language, but publications in English are promoted as the possibility to reach a broader audience, which contributes to the naturalization of English as the lingua franca of research in mathematics education. Moreover, at least three journals from the comprehensive list publish only papers written in English, and four journals have their names in this language. The promoting to write only in the current lingua franca could encourage the belief that publishing in English is the most important and that publishing in any other language will become lost science (Stolerman & Stenius, 2008)—there is “the risk that important knowledge is ‘lost’ if it is not published in English” (Meneghini & Packer, 2007, p. 113). Currently, editors and authors “believe that the publication of an article in any language other than English will decrease the accessibility to the results of the research and its diffusion among more numerous collectives” (González-Alcaide et al., 2012, p. 299). And despite the diversity within Ibero-American journals and the political decisions of including English, there is very little visibility of Ibero-American journals outside the region. As Meaney (2013, p. 68) argues, “[w]hen researchers are expected to (only) reference research published in English-language journals in order to be taken seriously, then there are some serious issues about what mathematics education research is valued and for what reasons.”

7 The beyond quality metrics

University policies such as those currently implemented in countries like Chile and Mexico provide economic incentives to academics who manage to publish their articles in journals indexed in Scopus and WoS, to the detriment of the scientific communication directed to the general and non-specialized public that could be interested in and benefit from the results produced in our field. It is known that when researchers select a journal to submit their publications, a number of them are highly influenced by the indexes to which the journal belongs (Pajić, 2015). Thus, mathematics educators from Ibero-America—and probably from other regions of the world as well—are subject to an overwhelming points system, which is supported by the educational and research institutions to which they belong, and from which it is very difficult to escape. Once absorbed by this points system, the person must learn to “survive” in order to prove his/her value and competences as scholar: to be accountable to the market business-like institution. The search for academic survival can even lead to fraudulent publication practices and academic corruption (see Herndon, 2016). This search for survival causes the academics to move away from activities that are fundamental for the development of our discipline and the production of new knowledge (such as training young researchers or carrying out peer review work), just because such activities generate few points in the system. Not to go further, a close example is our own decision of submitting this academic work to an indexed journal like *Educational Studies in Mathematics (ESM)*: it is more likely that our research will be considered relevant and of quality by our colleagues and affiliation institutions, if it is published in *ESM*, than if we publish it in an Ibero-American journal that does not belong to the most prestigious indexes.

We are at a moment in which we must start to think critically about how journal classification and indexing systems are affecting the scientific production in our region, and the quality of work and personal life of academics. Do we want to continue in a system where agents external to the region decide about the quality of journals and research? Do we want to

remain governed by a point system where the importance is not on the ideas or contributions, but where they are published? Are we not allowed to decide by ourselves which are the best mathematics education journals in Ibero-America? We think this is perfectly possible, and we hope that this work will encourage a deeper reflection on this issue among mathematics educators from Ibero-America and other regions of the world.

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