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Assessing Journal Quality in Mathematics Education

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ASSESSING JOURNAL QUALITY IN MATHEMATICS EDUCATION

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Introduction

- The quality of academic journals can be assessed in several ways—through acceptance rates, prestige of editors and editorial board members, and a track record of publishing landmark studies in a field.
- One of the most important characteristics of a journal is the impact its contents make on subsequent scholarship as measured by citations. In the modern age of technology and "big data," it is now easier than ever to generate a publication's citation count—that is, how many times it has been cited by other peer-reviewed publications (Garfield, 1963).
- The sources and targets of the citations can be identified and aggregated in various ways (e.g., Jiménez-Fanjul, Maz-Machado, & Bracho-López, 2013), allowing for complex measures of journal quality and impact to be constructed.
- These measures are relevant to scholars as they seek to disseminate their work and maximize impact on the field.
- It is also relevant to university administrators as they decide how to use these technological capabilities to assess the scholarship of their faculty (Howard, 2013; Shapiro, 2006).

Defining Top Tier

- Within the broad field of education and educational research, there has frequently been talk of "top-tier" journals and what constitutes quality research (e.g., Hostetler, 2005). Mathematics education, in particular, is typically treated as a sub-field of education and educational research.
- Recently, Toerner and Arzarello (2012) presented the results of a survey completed by 75 experts in mathematics education representing 32 countries, who were asked to assign letter grades to various internationally-reaching journals in mathematics education. Their survey initially included 28 journals, but the results yielded rankings for only 17 because the respondents were not sufficiently familiar with some of the journals.
- Williams and Leatham (unpublished manuscript, 2009) conducted a similar survey, involving 46 scholars within the United States, and asked them to rate 22 journals or proceedings. They produced a set of Tier 1, Tier 2, and Tier 3 dissemination venues in mathematics education based both on survey responses and citation counts. Although unpublished, their work has been shared with many scholars and used in tenure-and-promotion dossiers. Did anyone here participate in their survey?

Table 1 *Recent journal rankings according to surveys of scholars*

Tier	Williams & Leatham (unpublished manuscript)	Toerner & Arzarello (2012)
1*	JRME	JRME
1*	ESM	ESM
1	JMTE	JMTE
1	MTL	MTL
1	JMB	JMB
1	FLM	FLM
1		ZDM
2	MERJ	MERJ
2	IJMEST	IJMEST
2	RME	RME
2	IJSME	IJSME
2		RDM
2	IML (FOCUS)	
2	MTED	
2	SSM	
2	MTMS	
2	TCM	
2	MT	
3	PME (proceedings)	
3	PMENA (proceedings)	
3	CITTE	
3	PRIMUS	
3	TMEiast	TMEiast
3	TMEor	
3		CJSMTE
3		JMD
3		NOMAD
3		TKL

Research Questions

In this study, we triangulate the rankings in Table 1 with other measures of journal quality offered through database algorithms. In particular, we address the following questions:

- What are the rankings of journals in mathematics education?
- To what extent is there overlap and agreement among the survey and database rankings?

Method

- Collected a set of journals explicitly focused on mathematics education
- Started with Toerner and Arzarello (2012)
- Used http://mathedjournals.wikispaces.com
- Internet searches
- Reference tracking (looking in reference lists of journals listed in Toerner & Arzarello)

Not included:

- those that sometimes publish mathematics education articles (e.g., AERJ, Cognition & Instruction, etc.)
- Not included: Regional journals

Table 2 *2014 Web of Science mathematics education journals*

Rank	Journal	IF	IF without self citations
1	JRME	1.233	0.906
2	EJMSTE	1.016	0.790
3	ESM	0.579	0.386
4	IJSME	0.575	0.450
5	RELIME	0.400	0.400
6	MTL	0.400	0.320

Table 3 *2014 Scopus data for journals in mathematics education compared with two survey-based studies, ranked in order by SJR score*

Journal	SJR	Williams & Leatham Tier	Toerner & Arzarello Tier
JRME	1.976	1*	1*
MTL	1.103	1	1
ESM	1.042	1*	1*
JMTE	0.874	1	1
JMB	0.853	1	1
IJSME	0.668	2	2
ZDM	0.647	--	1
MERJ	0.603	2	2
JMD	0.363	--	3
IJMEST	0.336	2	2
PRIMUS	0.305	3	--
CJSMTE	0.281	--	3
RME	0.224	2	2
TMEiast	0.137	3	3

Table 4 *2015 GSM for journals in Mathematics Education that have an h5 value and at least ranking from the survey-based studies*

Journal	h5-index	Williams & Leatham Tier	Toerner & Arzarello Tier
ESM	28	1*	1*
ZDM	22	--	1
JRME	22	1*	1*
IJSME	21	2	2
JMTE	20	1	1
JMB	15	1	1
SSM	16	2	--
IJMEST	15	2	2
CJSMTE	12	--	3
RME	11	2	2
TMEiast	11	3	3
MERJ	10	2	2
PRIMUS	9	3	--
MT	8	2	--
MTMS	8	2	--
TCM	8	2	--

Points of Interest

- Web of Science is so limited that it is essentially useless within mathematics education.
- Scopus includes the major research journals in our field, with the exception of SSM, but it does not include the major practitioner journals of MT, MTMS, and TCM.
- While we recognize that practitioner journals measure their impact in circulation and use by teachers, it is beneficial to see them at least included in GSM to show that they are also a legitimate venue for disseminating scholarship.
- GSM, which one might expect to encompass all journals given the breadth of Google Scholar's search range, *was actually less inclusive than Scopus with respect to major journals in the field*.
- Because of the imposed five-year minimum of 100 articles, GSM excluded MTL, FLM, JSE, JMD, and TKL, all of which appeared in Toerner and Arzarello (2012) and in the top 20 in Scopus (FLM did not appear in Scopus 2014).
- New journals, such as MTE and IJSTEM, were not included in any of the rankings because they have not existed long enough to produce IF, SJR, or h5 measures.

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