



JOURNAL IMPACT FACTOR: EXPIRED PRESCRIPTION FOR ACADEMICS RESEARCH OUTPUT

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Abstract: *The purpose of this study was to gather lectures' views on the use of the journal impact factor to assess the quality of their research for tenure and promotion. The study was motivated by a university' promotion policy which required journal impact factor for lecturer research quality assessment in 2014 when its initial originator (Garfield, 1968) denounced its application for the assessment of journal quality and research. The study was guided by qualitative research methodologies. Data were collected by a desk research survey of literature for ideal journal impact factor uses. This was followed by a survey in which 147 lecturers from two universities responded to a self-reporting questionnaire. Focus group Discussions were held with lecturers to clarify issues raised from questionnaires and to capture group perceptions. Literature revealed that journal impact factor is a numerical value (mean) of journal's citations in two years. The use of the mean when calculating the journal impact factor is mathematically inappropriate and unreliable measure of research quality. Literature recommended the confinement of journal impact factor to its original use of identifying popular journals for librarians' decisions. Surveys revealed that the majority (87%) of participants considered it as a wrong instrument for assessing the quality of their research. Respondents considered the introduction of journal impact factor as a gate keeping strategy applied by university promotions committee. Publishing in journals with high impact factors compelled them to resort to external journals while starving local journals of quality research papers. It was expensive for them and increased the externalization of foreign currency. This study recommends that, journal impact factor is an expired prescription for lecturer research output. It should be called journal visibility factor and not impact factor and not be used for assessing research quality because citation frequency is not a quality indicator. The implication of these findings is that, the university should suspend the use of journal impact factor to save foreign currency, promote local journals and focus researchers on solving local problems.*

Key Words: *Impact factor, Academics, Research output, lectures*

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INTRODUCTION

The implementation of top-down research policies deprived of beneficiary support, has problems, is problematic and is a rich source of administrative problems in universities. A typical case is the use of journal impact factor for the assessment of the quality of research for lectures' tenure and promotion. It requires the normative re-education model of policy implementation to succeed. Otherwise it will be a source of conflict between lecturers and their university management. To that end, this study presents lecturers' views on the application of journal impact factor to determine the quality of their research submitted for tenure and promotion in a university in Zimbabwe. This is an important contribution to formative policy evaluation.

Universities the world over, are the highest academic institutions distinguished from other institutions of higher learning by their key function of research, knowledge dissemination and academic freedom. Bligh (1990:160) justified university academic freedom on the assumption that academics research and test ideas at the frontiers of knowledge not yet visited by others. It can be noted that the academic research function is also based on the assumption that academics have the competence to research. Subsequently research is a lecturer variable in the sense that, lecturers teach research methods and supervise students research projects. In addition, lecturers' job-descriptions require that they carry out pure and applied research to solve community problems. Their tenure and promotion is based on the quality of their research. It is the process of assessing the quality in research, which is the source of this study research problem.

One of the factors influencing lecturer research and its quality is the university research policy. Hill (2000) called for a clearly defined research policy highlighting the research agenda and priorities to focus institutional research efforts. There was no mention of what instruments to use. Besides, lack of a clear research policy funding is another problem in Zimbabwe's universities. According to Chombo (2000) the solution is for lecturers to fundraise. Unfortunately, fundraising was not welcomed by academic staff who argue that their business is to teach and not fundraising. In times of financial scarcity, both the quality and quantity of lecturer research output suffer.

Nherera (2000) identified two hurdles to university research in Zimbabwe, lack of mentors and local journals. He noted that retention of qualified senior staff in most African



universities was problematic. Graduates sent abroad for training left university for private sector or remained abroad. The situation compelled universities to do with new lecturers and teaching assistants without research mentors. In addition, there are limited local journals interested in research focused on Africa. Nherera (2000:54) explained the pathetic situation when he said, "Most of the prominent international journals in which African scholars must 'publish or perish' are in Europe or North America." Under these circumstances, Zindi and Munetsi (2008) attached lecturer anxiety leading to emotional stress to the demands for tenure requirements when no supporting material is available. The situation is made worse by the need for including the journal impact factor for each research paper that a lecturer submits for tenure and promotion.

STATEMENT OF THE RESEARCH PROBLEM

Some universities in Zimbabwe are imposing the use of journal impact factor for the assessment of the quality of lectures' research for tenure and promotion without lectures' concurrence. There is limited research on lectures' views from Africa and Zimbabwe in particular. The problem is compounded by the fact that, impact factor is misunderstood (Amin and Mabe, 2000). Molly and Walker (2002) observes that, most faculty members have heard the term "impact factor" yet many of them can neither define it nor describe its' relation to scholarly communication and determination of quality research. The problem mainly affects the lecturers who have no mentors to assist them write quality papers. Have no financial resources to fund the publication of their papers in foreign journals with high impact factors. This study provides lecturers' views as feedback to university promotions policy makers and implementers. Besides contributing to literature on the use of journal impact factor in Zimbabwe, the study is an important basis for formative research and promotions policy evaluation and strategy reformulation.

RESEARCH OBJECTIVES

This study intent to:

1. Describe the journal impact factor by definition, historical development, factors and its manipulative weakness.
2. Establish trends in the use of journal impact factor for assessing quality of research.
3. Deduce the uses and abuses of journal impact factor.



4. Present lectures views on the use of journal impact factor to assess the quality of their research for tenure and promotion.

LITERATURE REVIEW

Journal impact factor Definition

The universal application of journal *impact* factor accepts the definition of a journal impact factor as a numerical measure reflecting the *average number of citations* to recent articles published in a journal for the past two years (Wikipedia, Vale 2012, Amin and Mabe, 2000). Implied in this concept is the fact that, a journal can have an impact factor after its third publication. Objections to the use of journal impact factor for assessing the quality of lecturer research start from the definition. As a noun, impact is influence. Synonyms for impact include effect, impression and outcome. None of these resembles quality. Impact is defined as a measure of the tangible and intangible effects (consequences) of one thing or entity's action or influence upon another. This perception has a cause and effect implication. It should not be mistaken to mean that, an article published in a journal with a high impact factor is of high quality. Neither does it also mean that, papers that are never cited have zero impact (Seglen, 1997).

The second objection to the use of impact factor for research quality assessment is anchored on its use of average to measure quality. Seglen (1997) raised two points objecting to the use of mean for journal impact factor. First, citation counts follow a Bradford (a power law) with a positively skewed distribution yet the arithmetic mean assumes a linear distribution. Saha et al (2003) had to transform the impact factor logarithmically, because the relationship between impact factor and quality ratings is nonlinear. To this end, mean is mathematically an inappropriate measure for a positively skewed distribution.

The second objection is that, the mean is dependent on outlier cases. As a result, some articles which were never cited get a high journal impact factor because of the outliers. From this stance then, the quality of research depends on where (type and name of journal) not what (research content) you publish. Therefore the mean is not a reliable measure which can be used to measure the quality of lecturer research. Chow et al (2007) argued that, classification errors in conjunction with the weak citation advantage render journal rank practically useless as an evaluation signal. Stephen (2012:3) concluded by blaming



statistical illiteracy for those using journal impact factors by saying, “if you use impact factor you are statistically illiterate”.

Brief History of Journal Impact Factor

The genesis of journal impact factor can be traced back to two librarians Gross and Gross (1927). They were motivated to think of the journal impact factor by the question, “*What files of scientific periodicals are needed in a college library to prepare the student for advanced work, taking into consideration also those materials necessary for the stimulation and intellectual development of the faculty*” (Archambault and Lariviere, 2009:5). These librarians noted that, compiling the list themselves was biased by their likes and dislikes. Implied here is the fact that, journal impact factor aimed to facilitate librarians’ task of journal selection using it as an objective quantitative method. Application of Gross and Gross’s journal selection approach was confined to journals in a single field. This original problem had nothing to do with research quality assessment.

Allen (1929) and Gregory (1937) excluded journal self-citation articles (which they called, in-house citation) in the calculation of journal impact factor using Gross and Gross’s (1927) method. In 1956, Brown published a monograph entitled *Scientific Serials* which was a collection of citations from several journals from eight fields. There was no need to compare journals from different fields since the purpose was to identify relevant journals for librarians.

Archambault and Lariviere (2009) assign the creation of the journal impact factor to Martyn and Gilchrist (1960). In 1968, Martyn and Gilchrist developed the two year window for practical convenience. In 1965, the citations for 1963 and 1964 were available. It reduced the effort of counting and also reduced the cost of data acquisition. Their citations excluded abstracts, reviews and bibliography from the counts. Implied is the observation that, the two year period was for convenience rather than empirical appropriateness of the mean or nature of distribution. Garfield (1972) adopted Martyn and Gilchrist’s (1968) method and the Institute of Scientific Information (ISI) scaled it up to the commercial levels that we have today.

Fooladi et al (2013) reports that, Small (1973) developed the co-citation analysis as a self-organizing classification mechanism which small called Research Reviews. Giles, Bollacker and Lawrence (1998) introduced the autonomous citation indexing for the automatic



classification of any digital scientific and academic article. Subsequently, automated citation indexing including Google scholar, Institute for Scientific Information (ISI) and Elsevier got into operation. What is coming out of his brief history is that journal impact factor was not created for the assessment of research quality or the quality of journal articles.

Factors Influencing Journal Impact Factor

Amin and Mabe (2000:3) identified four factors influencing journal impact factor. First is the fact that, journal impact factor depends on the subject area. Science journals have higher impact factors than those in humanities. Second is that, journal impact factor depends on the number of authors per paper. The tendency by authors to cite their work results in papers with more authors receiving more citations than those by single authors. Third is that, the type of journal influences its impact factor. Letters and reviews receive more citations than full long papers. The fourth factor is the size of the journal (number of articles published per year). On-line journals which publish monthly gain visibility more than those journals common in Zimbabwe's universities which publish at most three issues per year. An evaluation of this fourth point shows that, the demand for a high journal impact factor from a Zimbabwean academic is to force him/her to publish in foreign journals. Molly and Walker (2002) added the fact that, the size of the citation measurement window (period of high citation) also determines the journal impact factor. Armed with these factors, journal editors have manipulated the journal impact factor in different ways.

Editor Manipulation of Journal Impact Factor

Editors aware of the weaknesses in the process of determining the journal impact factor, resort to some unethical means of manipulating it. Seglen (1997) identified four techniques that editors can apply to manipulate their journals' impact factors. First, editors can publish a large percentage of review articles. These are expected to be cited more than research reports. One implication of this technique is that, they reject case studies due to their perceived limited generalization and hence chances of being cited. Second, a journal can have a policy to publish, "by invitation only". This ensures that, the journal publishes research by senior researchers only. This leaves novice researchers out in the cold. Third, editors can call for papers within a set of research themes only. This can attract funding for the journal if the themes fall within the interests of those with the funding. Fourth, editors can decide to publish the bulk of its' publishable papers early in the year to increase their



window period. In addition Moustafa (2004) pointed out that, editors can use coercive citation technique. They ask those intending to publish in their journals to cite at least a certain number of articles (say five) from their previous publications. These manipulation techniques show that journal impact factor is an unreliable measure of the quality of research in that journal.

I also see the possibility of editors, increasing the journal impact factor by improving the articles' titles and abstracts so that they attract readers. Recently I have received invitations from editors offering discount on publication fees to attract researchers and increase the probability of journal self-citation. Editors can also encourage a multiple authorship to share publication expenses and increase the chances of self- publication. In this case, the journal impact factor is created by the editor and does not reflect the ability of the researcher to report quality research.

Trends in the Use of Journal Impact Factor

According to Saha, et al (2003) use of journal impact factor to assess the quality of research is based on the assumption that, citation frequency accurately measure a journal's importance to its' readers. By citing the particular journal, researchers are casting their votes for that journal because it has something important. In this case the opinions of both practitioners and researchers are relevant in judging the importance of that journal. Chow et al (2007) added that, visibility effects can be quantified by the citation rates of journals hence an appropriate surrogate for research paper quality. What a critical reader cannot miss is that, being visible is not the same as being of high quality.

Although Seglen (1997) admits that, evaluating scientific quality is a notoriously difficult problem with no standard solution, he/she notes that committees resort to crude quantitative methods like the use of journal impact factor. The word "crude" expresses incompleteness. On the contrary Brembs, Button and Munafo (2013) deduced that, journal impact factor corresponds well with subjective ratings of journal quality and rank. Advocates of journal impact factor like Neuberger and Counsel (2002) and Gunn (2004) note that, despite valid concerns, impact factor is widely used and offers the best simple tool for comparison of research out put quality. Fooladi et al (2013) itemized the four benefits of impact factor as:

1. It is easy to apply.



2. Its' use of the mean offsets the benefits of journal age, size and frequency of issues published.
3. It helps librarians to identify and select journals that are frequently read for their clients.
4. Impact Factor is available, acceptable and popular.

What is clear from these points is that, all the four points are based on the application simplicity. None is on the valid conceptual use and implications for the researcher whose work is being evaluated. Despite the fact that administrators do not understand the impact factor (Amin and Mabe, 2000) they have proceeded to apply it for funding and promotion.

Adam (2002) reports that, in Germany impact factor is used to determine departmental funding eligibility. The Italian Association for Cancer Research also require impact factor for funding. In Finland, government funding for university hospitals is based on impact factor pro-rata. Applicants with aggregate impact factor get more funding. In these cases, impact factor is used to distribute resources among competing groups.

Several universities are known to have used impact factor for assessing the quality of research for promotions. In Singapore impact factor is used by medical school deans and administrators to measure academic research efforts (Rogers, 2003). United Kingdom's Research Association Exercise (RAE) uses impact factor only (Eston, 2004). In Japan, (Abbasi, 2004) noted that impact factor was a requirement for promotion. Okoye (2010) reports that, impact factor was introduced in The University of Nigeria. In all these cases, use of impact factor was suspended because of stiff opposition from the majority of academics. This reaction encourages me gather lectures' views on the use of impact factor to assess the quality of research in Zimbabwe.

Journal impact factor was created to support librarians in managing their journal collections. To that end, Thomson Scientific, pointed out that Journal Citation Report (JCR), provides information for use by five groups of people. These are: First, *Librarians* for the management and maintaining journal collections and budget subscriptions. Second are *Publishers*. These can use the information to monitor their competitors, identify new publishing opportunities and make decisions regarding current publication trends. The third group is composed of *Editors*. These can use the (JCR) indices to assess the effectiveness of their editorial policies and objectives. They can also monitor their journal standing in



relation to other journals in the same field. The fourth group of beneficiaries is made up of *Authors*. These can use the data to identify journals in their field in which they can publish. The last but equally important is the group of *Information Analysts*. These can track biometric trends for the study of sociology of scholarly and technical publications and citation patterns within and between disciplines.

What cannot escape any critical eye is that, lecturers' promotion committee members are not included on this list of people expected by Thomson Scientific to use Journal Citation Report data including the journal impact factor. It funnels down to the fact that, lecturers' promotion committee members demanding the journal impact factor for research papers submitted for tenure and promotion are abusing it. Such abuse of journal impact factor received differently worded objections presented in the next paragraph.

Objections to Use of Journal Impact Factor for Lecture Research Assessment

I am presenting objections to the use of journal impact factor for lecturer research assessment paraphrases to return the emotional overtones in them. I presented them in chronological order to reflect development in stakeholders' perceptions.

1. Impact factor is a journal metric and should not be used to assess individual research (Seglen, 1997).
2. Garfield (1998) the original contributor, warned that, "journal impact factors are an inappropriate and misleading measure of individual research quality, especially if used for tenure and promotion"
3. The use of journal impact factor for evaluating individual scientists is even more dubious considering the statistical and sociological variability in journal impact factor (Amin and Mabe, 2000).
4. Equally foolhardy is to penalize authors for publishing in journals with impact factor less than a certain fixed value say 2.0 (Molly and Walker, 2002).
5. Impact factor does not measure quality (Moed, 2005).
6. The Higher Education Funding Council in Britain came to understand that it was assessing science in a fundamentally unscientific way by using the impact factor of journals as a surrogate for the impact of articles published in them (Smith, 2006).
7. Journal impact factor can be used only and cautiously- for measuring and comparing the influence of entire journals, but not for the assessment of single papers, and



certainly not for the assessment of researchers (European Association of Science Editors, 2007).

8. A citation's meaning can be far from "impact". While having a single number to judge quality is indeed simple, it is illusory and can lead to a shallow understanding of something as complicated as research. (International Mathematical Union (IMU) in cooperation with the International Council on Industrial and Applied Mathematics (ICIAM), and the Institute of Mathematical Statistics (IMS), 2007).
9. Using impact factor to derive the quality of individual articles or their authors seems to be idle (Baum, 2011).
10. The journal impact factor is a tool to help librarians identify journals to purchase, not a measure of the scientific quality of research in a journal. Do not use journal impact factor as a surrogate measure of the quality of individual research articles (The San Francisco Declaration on Research Assessment (DORA) in 2012).
11. Impact factor is widely miss-interpreted among the scientific community as the typical number of citations that a paper from a given journal will accrue in 2 years. Extrapolating of impact factor to individual researchers and papers is erroneous and dangerous. If you use impact factor you are statistically illiterate and if you see someone else using impact factors and make no attempt at correction, you connive at statistical illiteracy (Stephen, 2012).
12. Impact factor is used by administrators who themselves do not understand the science (Vale, 2012).
13. Using journal impact factor rank as an assessment tool is bad scientific practice (Brembs, Button and Munafo, 2013).

This literature funnels down to the deduction that, impact factor was not created for determining research quality. It is not a reliable measure of research quality due to the inappropriateness of the mean and being open to manipulation by editors. The majority of authors do not support the use of journal impact factor for the assessment of lecturer research quality. Literature on lecturers' views on the use of journal impact factor to assess the quality of their research from Africa and Zimbabwe in particular is scanty.



METHODOLOGY

Research design

This study made use of qualitative methods guided by Punch's (2006:17) model of research designing. It is made up of two parts, the pre-empirical stage (mainly literature) and the empirical stage for lectures views. Desk research was considered ideal for information of a concept that those around are not sure of. The design allows the researcher to include literature as data and bench-marks for the empirical stage. The empirical stage applied a descriptive survey to capture lectures' and administrators views on the use of impact factor to assess the quality of research submitted for lecturers' tenure and promotion.

Documents

There are limited books in libraries in Zimbabwe, which focus on journal impact factor. I used purposive sampling of internet material. Archambault and Lariviere (2009:2) reported that a lot of research papers on journal impact factor were written from 1990 to 2005. I used the link words "Impact Factor", "Impact Factor use and abuses", "history of impact factor" and "studies on impact factor" to search for relevant documents on the internet. The next step was to validate the documents for genuineness in terms of time, detail and jargon used in the paper. Papers published around 1960s were preferred for definitions, purpose and context of journal impact factor creation. Papers published around 2000 were rich sources for journal impact factor use and abuses debates.

Lectures

The use of journal impact factor to assess the quality of research affects and expected to benefit lectures most. In this study lectures include those members of the academics promotions committee who implement the impact factor. They were selected because they were available, had the required information and were willing to participate in the study. These were considered rich sources of varying views on the subject. The sensitive nature of the problem called for the application of purposive sampling. Participants were picked because they were not tenured hence were affected. They were tenured but wanted promotion to senior lecturer or professor level. Members of the academics promotions committee were considered rich sources for management



Data Collection and Presentation

Participants completed a self-reporting questionnaire. This instrument was considered ideal since all lecturers are literate and able to record their views. Individual views were collected in a short period of three weeks. Questionnaire responses can be available with the original response, for analysis any time. Participants also held Focus Group discussions to capture group views and clarify issues raised in the questionnaires. Data presentation was guided by the following research question themes; definition of journal impact factor, its developmental history, expected uses and abuses. These were presented under literature review. The findings presented below show lecturers' views from the empirical stage.

STUDY FINDINGS AND DISCUSSIONS

Response Rate

Participants were distributed by participant group needs and gender as shown in the table below.

Table 1, Participants' distribution by Group Needs and Gender

Participant's needs	Group	Tenure	Promotion	Promotion Committee	Totals
Males		66	8	11	85
Females		51	4	7	62
Totals		117	12	18	147

Although the purpose of this study is not to generalize findings and sampling was purposive, the table shows that, the number of female participants in this study is lower than that of males. Findings can be dominated by the male voice because of this distribution. The other clear projection is that, the majority of participants are not tenured. This can confirm findings by Nherera (2000) and Chinamasa (2012) who reported that the majority of lecturers in Zimbabwe's new universities have no mentors to develop their research skills for publication, tenure and promotion.

Table 2, Participants' Views on use of Journal Impact Factor to Assess Quality of Research.

Participants' Views	For	Not Decided	Against
Males	5	3	77
Females	3	7	52
Totals	8 (5%)	10 (8%)	129 (87%)



The results show that, the majority of participants are against the use of journal impact factor to assess the quality of their research for tenure and promotion. It is interesting to notice that, 18 of the participants were members of the academic promotions committee. There were 18 participants 8 were for and 10 were not decided. It may not be accurate deduction to say that, members of the academic promotions committee were either for or undecided. It may be proper to infer that, some of the members of the academic promotions committee are against the use of the journal impact factor to assess the quality of lecturers' research.

Participants' justifications for their views are presented in the table for a quantitative comparison. Actual words used are copied and presented to allow readers to deduce emotional overtones themselves.

Table 3, Participants' justification FOR and AGAINST use of Journal Impact Factor

Justification FOR Journal Impact Factor	Justification AGAINST Journal Impact Factor
<ul style="list-style-type: none"> ✓ It is accepted as a measure of journal quality ✓ It has been used in other universities abroad ✓ It is a quality improvement technique through corrections and implementation of rejection comments ✓ It forces our lecturer to compete on the international arena ✓ It is easy and objective ✓ Encourages cooperation among our researchers to share costs. ✓ Increased exposure of researchers who publish in journal of high ranking ✓ Increased use of internet for On-line journals and e-mail communications ✓ Compelled lecturers to look for alternative journals in which to publish 	<ul style="list-style-type: none"> ✓ It is not a measure of quality of the research ✓ Those using journal impact factor on us were not promoted to those ranks using that instrument ✓ It is a gate keeping instrument that they designed for us ✓ Forces us to publish in foreign journals which are expensive hence creating costs for us ✓ It deprives local journals of good research which affects their impact factor ✓ That is a strategy to promote foreign journals ✓ It is an unreliable instrument for quality assessment ✓ Zimbabwe's journals have not yet got an impact factor. That disqualifies most our quality research published in them. ✓ It was not created to measure quality in research, hence a wrong tool ✓ That is abuse of journal impact factor. I don't think those people know it ✓ It is not impact but visibility factor



	<p>because it reflects visibility not impact</p> <ul style="list-style-type: none">✓ Good studies on policy in Zimbabwe which have lead to policy changes are rated of low quality because they were not published in journals with an impact factor, that is wrong concept of quality research with impact✓ It increases the externalization of foreign currency✓ Destroys the local journals market✓ Compels researchers to address external problems on the expense of local problems with utility value✓ Promotes the impact factors of foreign journals which already have high impact factors✓ It is outdated; see Garfield's (1989) warnings. That is an expired drug prescription for Zimbabwe's academics. Shame on you.
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Implications

There are more arguments against the use of journal impact factor for assessing the quality of research form both literature and surveys. The bulk of literature points out that it was long back abandoned for more comprehensive methods of evaluating quality in research. The implication of these findings is that, the university should suspend the use of journal impact factor to save foreign currency, promote local journals and focus researchers on solving local problems. If the journal impact factor is to be considered, it must contribute a very small percentage; say 2% in the rating of the quality of the research. The quality of research must be assessed by peer-reviewers and editors who publish them. If the academic promotions committee has no confidence in publishers' assessment, then three independent members must read through the papers and the decision of any concurring members must be taken.

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