

CHAPTER V

DISCUSSION AND CONCLUSION

This chapter summarizes the findings of the current study based on the research questions posed and presents the discussion of the results. It draws conclusion from the results and discusses the limitations and the significance of the study. At the end of the chapter, the research contributions and recommendations for future studies are described.

The purpose of this study is to determine which Indonesian-based journals are most essential to a particular discipline i.e agricultural science. In view of the above problem, this study intends to address the following research objectives:

- a. To assess the quality of Indonesian agricultural journals based on bibliometrics approach;
- b. To determine how Indonesia-based agricultural science researchers assign and calibrate trust to the journals they use;
- c. To determine how Indonesia-based agricultural science researchers assess the usability of the journals they read;
- d. To produce an internal ranking of the Indonesian agricultural journals based on (a), (b) and (c);
- e. To compare and contrast the internal ranking of Indonesian agricultural journals based on (a), (b) and (c) using gap analysis.

In order to address the research objectives, five research questions were posed.

- a. What is the quality of Indonesian agricultural journals based on productivity and impact indicator?

- b. To what extent do Indonesia-based researchers trust the agricultural science journals that they use?;
- c. To what extent do Indonesia-based researchers assess the usability of the agricultural science journals that they read?;
- d. What is the internal ranking of the Indonesian agricultural journals based on quality, trust and usability indicators?;
- e. How does the internal ranking differ based on quality, trust and usability indicators?.

The study uses two approaches for the data collection to determine the quality, trust and usability of nine Indonesian agricultural journals: bibliometrics for the revealed preference study to gauge the quality of the journals; and expert opinions sampling authors and researchers for the stated preference study to gauge the trust and usability of the journals. Finally, the comparison of the various studies has been provided in order to illustrate the positions of these journals in the scholarly communication against that of the other countries.

5.1. Answering The Research Questions

5.1.1. Quality of Indonesian-based agricultural journals based on productivity and impact

In terms of authorship, the authors came primarily from Indonesia and fifteen other countries namely Bangladesh, Belgium, France, Germany, India, Japan, Kenya, Malaysia, Netherlands, Pakistan, Philippines, Sri Lanka, Thailand, United Kingdom, and the United States of America. The Indonesian authors contributed 92.57% of the total authorship followed by Malaysia (1.90%) and Japan (1.41%). The low number of

international contribution on IAARD journals showed that the journals are not visible enough and have not been accepted as an international journal. This is due to fact that the journals are written in the national language, Bahasa Indonesia. This language possibly constrains international researchers' contribution to and citation of these journals. The other reason is the number of exemplar and distribution of the journal is limited to the national level. Although two of them are distributed internationally, namely JAS, which is used for publication exchange with international organization and NAK which is registered on Directory of Open Access Journals (DOAJ), most of the journals are still locally distributed. However, recently, all journal titles are available on digital format and delivered through an institutional repository called *Repositori Publikasi Badan Litbang Pertanian* (<http://digilib.litbang.deptan.go.id/repository/index.php/repository>). Regarding to the geographic distribution of the authors, findings of this research show the similarity to the research conducted by Bakri and Willet (2008). They found that geographic distributions of authors of *Malaysian Journal of Library and Information Science* dominated by Malaysian authors. In addition, India, Bangladesh, Africa, Australia, and Sri Lanka's authors are also contributing in the journal. Similarly, Dixit and Katare (2007) reported the low number of international contribution on the *Journal of Indian Society for Cotton Improvement*. Only three foreign institutes contribute in the journal.

In terms of impact factor, *Jurnal Hortikultura*(HOR) has the highest impact factor (1.23) followed by *Jurnal Penelitian dan Pengembangan Pertanian* and *Jurnal Agro Ekonomi* with an impact of 0.78 and 0.51 respectively. Sutardji (2011) reported that impact factor of *Jurnal Penelitian Pertanian Tanaman Pangan* was 0.30. This score was almost similar to this research finding (*JTP*, 0.38). Azevedo et al. (2010) conducted research on Brazilian freshwater ichthyology. He found almost similar finding where impact factor

scores were less than one. Compared to other international horticulture journals indexed in Web of Science and Scopus, HOR with an impact factor of 1.23 is higher compared to *Indian Journal of Horticulture*, *European Journal of Horticultural Science*, and *Horticultural Science* (Table 4.13). On the other hand, HOR's impact is lower compared to *Journal of the American Society for Horticultural Science*. This shows that HOR had been cited higher at the national level compared to three other international journals at the international level, except for *Journal of the American Society for Horticultural Science*.

Journal quality index of IAARD journals reached a highest of 2.59 by HOR, followed by JAE, and JAS with journal quality index of 2.91, and 2.66 respectively. HOR places on the first journal quality among the IAARD journals due to the high level of 3 indices value of the journal compared to other IAARD journals. The other indices include self-citation (4.30), type of information sources (4.34), and impact factor (1.23). Moreover, the type of information sources value of the journal is the highest among all IAARD journals. JAE shows that the highest value index is on the self-citation (4.43). Other indices value is also high. This makes the quality of JAE high. All quality indices of JAS are high, except for impact factor. The high quality index results in high journal quality. Katerattanaku and Hong (2003) assessed journal quality using citation-based journal index and applied citations per article, un-cited ratio, 20 + citations, self-citation, annual mean citation rate per article, cited count, and current article impact. They found that the study results also support the belief of many information systems academic leaders that the quality of information systems academic journals is comparable to that of other disciplines. In contrast this research calculating all the attributes together. Xiao et al. (2011) conducted similar research for assessing quality of *MIS Quarterly* (MISQ), *Information Systems Research* (ISR), and *Journal of Management Information Systems*

(JMIS) journals. Overall, MISQ performs significantly better than the other two information systems journals in the current citation analysis.

In terms of citation, IAARD journal articles had been cited globally. Retrieving the journal articles in Google Scholar and Scopus showed that Indonesian Journal of Agricultural Science received 91 citations comparing to *Jurnal Ilmu Ternak Dan Veteriner* (186 citations), *Jurnal Hortikultura* (125 citations) and *Jurnal Tanah dan Iklim* (21 citations). In Scopus, citations received by the journals were 4, 26, 4, and 0 respectively. The differences citation number between Google Scholar and Scopus is due to Scopus is international indexing journal, that mean that only articles in English language will be registered and cited globally. The low number of IAARD journals articles written in English limit the citation number of the journal globally. Meanwhile, Google Scholar does not limit the indexed journal for English language journal only. This will give opportunity for local language journal to be indexed in Google Scholar.

In terms of cited publication type, IAARD journals cited 11,830 articles. Only 19.31% of the citations were belonged to IAARD journals. The highest number of non-IAARD citation can be explained by the easy access of IAARD researchers to information resources. Internet application development, including digital library and electronic journal benefited to the researchers to access information related their research topics. Previously, when scientific journals were subscribed as printed journal, the numbers of subscribed journal are limited. This limitation was due to budget availability of ICALTD who provided scientific journal for IAARD researchers. With the easy access of internet and availability of electronic journals/databases, the number of subscribed journals increased. This will enable the IAARD researchers to download big number of articles for supporting their research. The internet access on electronic journals will also

open the opportunities to access information without geographical boundaries. This will enable IAARD author to get more articles from various journals and origin. Compared to the previous researches, Bakri and Willet (2008) found similar research finding. They reported low citation numbers of the *Malaysian Journal Library and Information Science*. They stated that about 86% articles on the journal do not cited. In the opposite, Hutchison and White (2003) reported the high citation of articles. Their research resulted 314 citations were made from 308 articles of *The Journal of The American Taxation*.

In terms of year cited, IAARD journals cited publication published from 1885 to 2010. Grouping into 5 years periods resulted that period of 1991 to 1995 received the highest number of citation (20.66%). This was followed by 1996 to 2000 and 2001 to 2005 with 19.57% and 15.43% respectively. Tiew and Kaur (2000) divided year of publish of cited articles on their research into periods of ten years. They reported that period of 1978-1987 had the highest citation with 31.03% of the total citations. Most of the cited year of the computer science literature were 1990-1999, followed by 1980-1989 and 1970-1979 with the total cites were 168, 25, and 3 count respectively (Goodrom, 2001). Makkasau and Mansjur (2006) stated that most of cited literatures published on 1991-2000 (341 of totally 762 articles, 44.75%). Only eight cited articles published on 2001-2005. Other citation was ten articles publish on 1921-1960. Similarly, Sutardji (2003) reported that most of cited articles published 11-20 year prior to year publication journal (40.15%) followed by 1-10 year (36.15%) and 21-31 (15.31%).

From the cited years of published mentioned earlier it could be summarized that the year of the previous research were varied. Tiew and Kaur (2000) and Ezema and Eze (2012) found that that the highest citation were 10-20 after it published. Makkasau and

Mansjur (2006) reported that the highest was 10-15 years after it was published. Meanwhile, Samdahl and Kelly (1999) and Sutardji (2011) found that the highest cited year of was 5-10 year old. In addition, Edzan (2007) reported that the highest citation was last three years. If the cited years of published in the previous researches compared to this research where the highest citation 1996-2000 (10-15 year old), we could conclude that the span is still in the span of other researches.

In terms of self-citation, IAARD journals received 1332 self cited articles of a total number of 11830 cited articles. This means the percentage of self-citation was 11.26, which was quite low. The numbers of self-citation of IAARD journals varied from 1 to 19 self citations per articles. The article with one self- citation per article was the highest in number (21.81%) followed by articles with 2 (17.51%) and 3 (10.68%) self-citation. Comparing to the previous research conducted by Katerattanakul and Han (2003), Bakri and Willett (2008), and Mehrad and Goltaji (2011), self-citations of IAARD journals were still permissible. McVeigh (2004) in Mehrad and Goltaji (2011) stated that self-citation is acceptable to some extent (at the most 20%). Self-citation rate of IAARD journals are varied from 7.07 to 17.71 (see table 4.36). These score are still under the score mentioned above. In addition, *Indonesian Journal of Agricultural Science, Jurnal Tanah dan Iklim, Jurnal Hortikultura* and *Jurnal Agro Ekonomi* showed almost similar score to research conducted by Sutardji (2003) and Kurmis and Kurmis (2010) where the self-citation rate was around 8.

5.1.2. Trust Of The Agricultural Science Journals Among Authors And Researchers

IAARD journals have been identified as journals having the good quality on accuracy, correctness, objectiveness, currency, clarity, conciseness, easy of understanding, clarity

of measurement units, relevancy, reliability, and overall trust. The journals have also had fair quality on coverage, all necessarily values, comprehension, and sufficient. IAARD journal has no impartial preview, recognized less than 50 percent of the authors, and trust for entire journal content. Quality of IAARD journals was 3.26. The value revealed that IAARD journals were fair to good quality. JTP achieved the highest quality of IAARD journals with the quality index value reached 3.44 followed by JAS (3.40), and JPP (3.39).

It is a challenge to discuss the findings in relation to other studies as trust of journals has not been ascertained in prior journal assessment research. Gendron and D'onofrio (2001) conducted a survey on healthcare industry and found that trustworthiness attributes of the system comprises accuracy, comprehension, conciseness, ease of understanding, objectivity, time obtained, relevancy, reliability and sufficiency. Alkhatabi et al. (2011) conducted a survey on e-learning systems and their research found similar attributes of trust. Findings of the researches conducted by Gendron and D'onofrio (2001) and Alkhatabi, et al. (2011) show similarity in the trust attributes of IAARD journals.

5.1.3. Usability Of The Agricultural Science Journals Among Authors And Researchers

Most respondents obtained the journals more than three months after its published (50.15%), read less than 50 percent of total articles, and read the entire articles comparing to only the interesting articles and to support their research. There are two main purposes of respondent on reading IAARD journal, namely to expand their knowledge and to support their research. Quality of IAARD journals according to usability index is 1.96. JEP is the journal with the highest usability index (2.19),

followed by TAN with the usability index reached 2.03. JAS and JTV have similar usability index of 1.98.

It is a challenge to discuss the findings in relation to other studies as usability of journals has not been ascertained in prior journal assessment research. What has been previously reported is on the reading of scholarly journals. King (2009) reported that scholars have read an average number of 22.6 scholarly articles per month and spent 132 hours per year reading scholarly articles. Seth (2006), Akinola (2009), King (2009), and Bhatti (2010) reported that scholars' purpose on reading journal is for supporting their research and expanding knowledge. However, how scholars read and use, cite and publish their research work has been discussed by many researchers. Weller (2001) pointed out that peer-review seems to be one pivotal criterion that many scientists employ in evaluating the legitimacy of publication venues. Tenopir (2003) indicated that peer-reviewed journals are more accepted and used by scholars because they are free of cost and accessible (Tenopir 2003). Rusch-Feja and Siebeky (1999) found that physicists, biologists and biomedical scientists use electronic journals more than other resource types. Tenopir et al. (2009) found that electronic articles account for the majority of readings among scientists, though most readings are still printed on paper for final reading. Scientists reported reading a higher proportion of older articles from a wider range of journal titles, and more articles from library electronic collections.

5.1.4. Internal Ranking Of The Indonesian Agricultural Journals Based On Quality, Trust And Usability Indicators

Indices of IAARD journals quality varied from 2.39 to 2.63. HOR is the first rank of IAARD journals, followed by JAS, JTP, JAE, TAN, JPP, JTV, TRI and JEP. TAN and JPP have similar indices and ranking. It seems that the quality of IAARD journals is

almost similar to the results of *Indonesian* Institute of Sciences (LIPI) accreditation for scientific journals. LIPI (2012) conducted accreditation using peer review for scientific journals. The accreditation exercise resulted in the only IAARD journals which received A predicate (more than 85 score) was JAS. The remaining journals had B predicate (70 to 85 score) with accreditation scores varied from 70.25 to 82.00. The accreditation results were almost similar to this research. Regarding quality of IAARD journal, it can be obviously seen that the predicates of the two assessments were almost the same.

Respondent's perception of *Warta Litbang Pertanian* studied by Mulyani et.al. (2006). revealed the scores of content attributes, namely, topic, currency, and relevancy were above 3 of 5 points Likert scale. They concluded that the content of *Warta Litbang Pertanian* was good. Hall (2011) conducted research on the ranking of journals on tourism, hospitality and cognate area indexed in Scopus. He applied attribute of journal ranking, namely, SCImago journal rank, H index, Published documents in year, Published documents in the 3 previous years, Total number of references, citations in 2008 received by journal's, documents published during the 3 previous years, citable documents published during the 3 previous years, average citation per document in a 2 and 4 year period, cited documents (05-07), average amount of references per document, and % international collaboration. The methodology for determining ranking of IAARD journal is similar. Hall (2011) determined the highest value of journal quality attribute as the first ranking journal. The difference is in the applied attribute.

5.1.5 The Difference Of Internal Ranking Based On Quality, Trust And Usability Indicators.

The internal ranking based on the three attributes showed that the gap was not too large, with a value of 0 to 3. This means that the ranking of the journals is almost similar when compared based on quality and trust, quality and usability and trust and usability. Hall (2011) compared journal ranking based on metrics used for SJR with journal rankings provided by expert panels for journal on tourism, hospitality and cognate area. The research indicates significant similarities and differences between ranking metrics and methods. Regarding this research, even there are different values in the gap analysis, there are still many similarities of the gap values. It is proven with the value of gap analysis which is small and ranking determination approaches result almost similar ranking.

5.2. Significance Of The Study

The significance of the study regarding assessment on IAARD journals based on three attributes i.e. journal quality, journal trust, and journal usability are as follows:

- a. It strengthens bibliographic and citation analysis studies with information regarding scholarly information on agricultural science in Indonesia.
- b. It strengthens the existing methodology on journal assessment using a combination of three indicators quality, trust and usability..
- c. It strengthens the practices on journal assessment in the area of library and information science by a combination of stated preference and revealed preference approach.

5.3 Contribution Of The Study

5.3.1 Theoretical contribution

This study has extended the assessment of scientific journals through two other attributes, trust and usability in the theoretical framework of the study. It has shown that that attributes of quality, trust, and usability have a role in the assessment of scientific journals. Combination of these attributes enriches other approaches of measuring journal quality, which is very often done through evaluative bibliometrics and citation analysis. The study comes up with four (4) variables to assess journal quality - namely Impact Factor, Type of Cited Publication; Year Cited and Auto-citation.

The trust and usability attributes have been used to assess the journals. The concept of trust is commonly used for determining the quality of an information system, meanwhile usability is used to assess usability of human computer interface (HCI) of an application. Eighteen (18) attributes for journal trust have been developed: namely, Impartial Preview, Recognition of journal, Confidence Accuracy, Correctness, Objectivity, Clarity, Conciseness; Ease of Understanding; Clarity of Measurement Unit, Currency, Relevance, All Necessary Value, Comprehension; Adequacy, Coverage; Reliability and Overall Trust. There are five (5) 18 attributes for journal usability: namely Journal Reading; Obtaining Time, Articles Read, Recognition of authors, and Reading Style. Extending the utilization of these approaches will benefit the scholarly community as well as library practitioners in the assessment of journals.

5.3.2 Methodological contribution

This study uses a combination of two approaches to assess journals: revealed preference study and stated preference study. There has been no study in the context of scientific

journals from the periphery world that uses both approaches to evaluate journals. Creagh (2011) found limitations on using only citation analysis because of the following reasons: citations have been displayed without correlating the age factor; only citing high impact journals; very good papers may appear in smaller journals; do not take into account papers published outside the list; more self-citations; favoring native language article; and cited more on fundamental research than applied research. In contrast, how authors evaluate journals is still influence by author's subjective feeling. Combining the two approaches enable to reduce the limitation.

5.3.3 Practical contribution

The practical contributions of this research are as follow:

- a. It can be of use for authors to gauge impact and trustworthiness for submission to these journals. It also can be used as an alert to improve international contributions and improve scientific recognition of organization through publishing of quality, trustworthy and usable scholarly journals.
- b. For the journal publisher, findings of this research assure quality improvement of IAARD journals by providing input regarding the strength and limitataions of the journals.
- c. It helps decision/policy makers in the agricultural science to decide which research on certain commodities or field of knowledge are worthy to be continued. It also could avoid redundancy of proposed researches by the institutions.
- d. Researchers and authors, especially more experienced authors and those in tenured positions, could consider the highly ranked journals as the first choice for submissions. The list was not intended to be proscriptive; rather, it would serve as a guide to help researchers and promotion review committees identify the influential

agricultural science journals in Indonesia.

- e. It may update policies on building library serial collections

5.4 Limitation And Recommendation For Future Research

In the conduct of the research, certain limitations were experienced. These may be summarized as follows:

- a. Missing numbers/articles IAARD journals. The availability of the sample articles should be obtained completely. Missing of sample articles will affect the research result. Even though, the missing sample article could not be avoided. The missing sample articles were not replaced with other articles, which were not listed as sample articles.
- b. Lack of perfect performance of OCR software and obtaining good quality photocopy of articles. Sample articles were not available in the digital format. Most of them were provided on hardcopy. Enabling data to be able to analyze fast and easily, author convert selected articles from printed format into text format. Unfortunately, the efforts on digitalizing articles have been faced poor printed copy of articles. This caused data lost due to misinterpretation on character recognition of the articles.
- c. AGRIS/CARIS categorization scheme limitation. AGRIS/CARIS categorization scheme were aided for the agricultural field analysis. The tool cannot fit to the entire fields of knowledge available on the cited articles. The limitations included the unavailability of certain fields that were not directly related to agriculture such as pure chemistry and pure microbiology science.

Since the limitations have occurred during research implementation, recommendations below should be considered in the future research to improve the research and result performances. The recommendations were:

- a. Avoiding missing articles will improve performance of the research. The missing articles were resulted from not only misplaced the journals, but also due to the carelessness on archiving the last copy of the respected journal. Avoiding the missing journals will complete samples and increasing representativeness of the journal population. Thus, the research performance will also be improved.
- b. Increasing number of sample will also improve performance of the research. When the resources (time, money, human, etc.) have enough in number, increasing number of sample will increase the research performance by increasing population representativeness.
- c. Most of IAARD journals published on 2000 and older have only printed copy. Converting data from printed articles into digital format for inputting data purposes need sharp and origin-like photocopy of articles. Poor quality of the copy will cause misinterpretation of characters on the characters recognition process. Obtaining sharps printed articles will decrease misinterpretation of characters and will also improve performance of data inputting. This will help researchers to fastened bibliometric and citation analysis process. Available articles in pdf format will also help author on inputting data.
- d. The AGRIS/CARIS categorization scheme has been used for classifying agricultural information among AGRIS/CARIS FAO members. Although the categorization scheme had been used widely around the world, some subject categories, such as non-agricultural information used in agricultural journal articles, were still difficult to classify. One possible action was to classify this type

of information into agricultural in general. It is also possible that making a new additional category will help overcome this problem.

5.5. Conclusion

Based on the findings, the following conclusions are made.

- a. The revealed preference study that gauge the quality of IAARD journals through bibliometrics approach indicated that IAARD journals are characterized by the numbers and contribution of authors, authors' geographic distribution, affiliations, agricultural commodities, subject categories, and official languages. The quality of these journals are characterized by Impact Factor, Cited Publication Type, Year Cited and Self-Citation. Journal quality index of IAARD journals reached 2.59. HOR, JAE, and JAS are the top three journals with the highest journal quality index.
- b. The stated preference study that gauge the trust of IAARD journals through user survey indicated that IAARD journals in general have been identified as journals that have good level of accuracy, correctness, objectiveness, currency, clarity, conciseness, ease of understanding, clarity of measurement units, relevancy, reliability, and overall trust. The journals also have fair level of breadth and depth of information, all necessarily values, comprehensiveness, and adequacy. IAARD journals have no impartial preview, are recognized by less than 50 percent of the authors, and are trust for the entire journal content. Trust index of IAARD journals was 3.26. JTP achieved the highest trust of IAARD journals with the index value reached 3.44 followed by JAS (3.40), and JPP (3.39)
- c. The stated preference study that gauge the usability of IAARD journals through user survey indicated that most respondents obtained the journals more than three months after the journals are published, they read less than 50 percent of the total

articles, and they read the entire articles compared to only articles that interest them. There are two main purposes why respondents read the journals: to expand their knowledge and to support their research. Usability index of IAARD journal is 1.96. JEP is the journal with the highest usability index (2.19), followed by TAN with the usability index reached 2.03, meanwhile, JAS and JTV have similar the usability index of 1.98.

- d. The model for Journal Quality, Trust, and Usability consist of 4 quality attributes, 18 trust attributes, and 4 usability attributes as listed below:
 - i. Journal Quality: namely Impact Factor, Type of Cited Publication; Year Cited and self-citation.
 - ii. Journal Trust: namely Impartial Preview, Recognition, Confidence, Accuracy, Correctness, Objectivity, Clarity, Conciseness, Ease of Understanding, Clarity of Measurement Unit, Currency, Relevance, All Necessary Value, Comprehensiveness; Adequacy, Coverage, Reliability and Overall Trust.
 - iii. Journal Usability: namely Journal Reading, Obtaining Time, Articles Read, and Reading Style.

The attributes form the Quality, Trust and Usability dimensions as illustrated in Figure 5.1 and may be used for journal assessment indicators, specifically for journals that are not indexed in any citation databases.

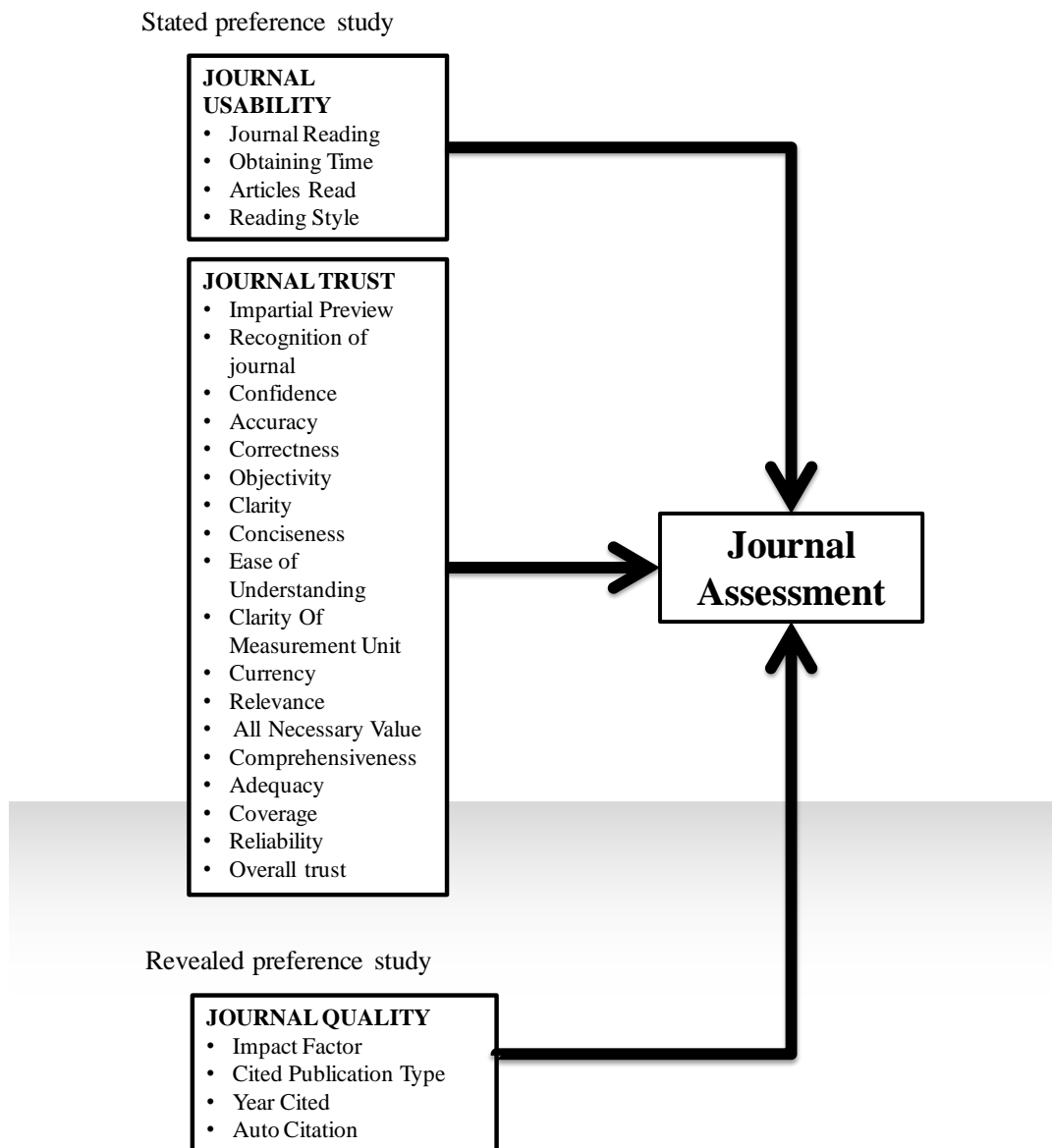


Figure 5.1. Model of quality, trust, and usability study of IAARD Journals

- e. Indices of IAARD journals quality varied from 2.52 to 2.71. HOR (2.71) is ranked first among IAARD journals, followed by JAS (2.66), JTP (2.64), JAE (2.63), TAN (2.64), JPP (2.57), JTV (2.61), TRI (2.58), and JEP (2.52). TAN and JTP have similar indices and ranking. The comparison between indicators resulted from

revealed preference and stated preference using gap analysis indicated that quality and trust, quality and usability, and trust and usability are not much different and the ranking of the journals is almost similar.