An Initial Survey on Perception of Usability ResearchGate in Scientific Paper Publications

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Abstract. In the information era of borderless Internet development and massive unlimited data access, especially in science and technology, one of which requires researchers and lecturers to rectify innovation, the quality, and quantity of research in Indonesia. This research examines the importance of empirically proving the success of the ResearchGate social media platform derived from Usability as a medium for indexing scientific paper publications that are needed for academic researchers these days. The following initial study is causality type research with a quantitative approach. The final sampling only involved 33 respondents who fulfilled the proviso's active ResearchGate account of at least one month. This research assesses Usability using a statistical inferential, i.e., linear regression analysis. These results concluded that overall, determinant Usability consists of Learnability, Memorability, Efficiency, Errors, and Satisfaction have no implication in partially. Still, Usability has substance simultaneously with a strong enough contribution score of 54.7 percent in ability ResearchGate indexing scientific paper publication.

Key words: ResearchGate, Usability, scientific community, publication, research discovering.

Introduction

The success of research manifested in the output; this is to measure the researcher's target in distributing the findings or research results (to deliver outcome) whether it has indicators that can measure the credibility of the output Elsevier (2020) stated that researchers have credibility in a scientific paper must be in the repository in each university saved. More than that, research outputs are recorded in journals in a certain indexation or ranking. The website is a bridge that introduces techniques used for academics and some elements to communicate and publish research results through links on the researcher's main page (Thelwall & Kousha, 2015: 876-889). Furthermore, a researcher can even broadly focus research on disseminating the results using non-profit-based publication media such as Academic digital platforms, Academia.edu, Google Scholar services, ResearchGate, and other academic, social media platforms and big data (Komljenovic, 2019: 148).

Industrial Revolution 4.0 in Indonesia, in the information era of borderless internet development and massive unlimited data access, especially in the field of science and technology, one of which requires researchers and lecturers to improve innovation, the quality, and quantity of research in Indonesia (Kementerian Riset, Teknologi, dan Pendidikan Tinggi, 2018), Although, in reality, there is still a sense of distrust among academics to seek open access and research data to the public (Irawan et al., 2017: 25-36), this is undoubtedly an opportunity for website and social media platforms to provide these services. But on the other hand, not an entire motive of all people for technology the wearing will result in usual adoption behavior (Permana et al., 2021).

Many web platforms are used by organizations that provide media or channels for

lecturers or researchers so that their outputs can be accessed publicly and used by the information society. The access that researchers usually choose, especially in Indonesia, is the criteria with features, including a URL link, DOI, indexed on Google Scholar, which is a reasonably fast process, uploaded articles that cited, and other access (Aurachman, 2020). The research is considered eligible if research publications are issued in institutions or communities, both institutional managers, whose credibility measuring by specific indices. In addition, ResearchGate is one of the academic, social media platforms that provide publication output, question and answer, and research job listings through account profiling with updates at any time in any updates (Kraker & Lex, 2015).

Based on a report released from sinta.ristekbrin.go.id *Ver*2.0, in 2020, it has 208,030 users, and the SINTA Indonesia application has verified only 112,128 studies (Kementerian Riset dan Teknologi / Badan Riset dan Inovasi Nasional, 2020). This condition, of course, raises concerns for users or lecturers regarding the indexation of the Google Scholar metric, which sometimes takes quite a long time, where there are still some scientific articles that have not been index to Google Scholar, of course, requires the help of media or other platforms to help accelerate and overcome the problem of indexation of scientific publications of a lecturer or academic researcher. The question that will certainly be asked to answer this problem is the length of time spent in browsing, updating profiles (accounts) and connectivity (Meier & Tunger, 2018).

Not much research has been from Indonesia, especially in the context of the successful indexation of scientific articles in publications among lecturers or academic researchers to the Google Scholar account linked to the SINTA account as the performance of each user such as Impact Factor, Citation Index, and others. Therefore, this research examines the importance of empirically proving the success of the ResearchGate social media platform derived from usability as a medium for indexing scientific paper publications that are needed for academic researchers these days.

Theoretical and Literature Review

Usability is defined as achievement; effectiveness is the accuracy and comprehensiveness of the user to reach the set target. Meanwhile, efficiency is the resources pull out concerning the accuracy and comprehensiveness of the user to attain the goal, and satisfaction is described as convenience and acceptability (Matera et al., 2006: 143). Aspects in usability include 5 (five) things, i.e.: (1) Learnability relates to how easy an application or website is to use. This convenience measures the use of available functions and features. (2) Efficiency is related to the speed of working on "tasks" in certain websites or software applications. (3) Memorability is related to users' ability to retain their knowledge after a certain period. A relatively fixed interface design layout drives this capability. (4) Errors relating to errors produced by users whilst interacting with definite applications or websites. (5) Satisfaction is related to user satisfaction since employing the applications or websites. Metering of satisfaction also puts facets of the returns acquired from users while using specific devices (Nielsen, 2013; Abdul, 2019).

ResearchGate is a social networking-based website released on 23 May 2008 by Dr. Ijad Madisch, a German citizen. This site is free to access, which is used as a collaboration among academic scientists which also has a broad range of articles of various disciplines that are published and has new indicators for each article that is uploaded (Nicholas et al., 2016: 173-182). This service is designed to provide benefits,

including file sharing, publication databases, forums, discussions, methodologies, groups, and others. In addition, ResearchGate has developed an internet-based semantic search tool capable of searching research papers from well-known internal sources and external databases such as PubMed, CiteSeer, arXiv, NASA Library, and so on (FISIP S3 Univ.Airlangga, 2018). Furthermore, ResearchGate can also increase academic influence and reputation; complimentary access for publications at the very frequently addressed gain and an occasion to change over ideas with another scientist (Nicholas et al., 2016: 173-182).

This research was motivated by several previous researchers, namely by articles on ResearchGate with factors of time, discipline, size, and the impact of visitors with research findings that the comprehensive coverage of papers uploaded to ResearchGate affects indicators to other authors and publications with DOI on ResearchGate may have a character different from other platforms (Thelwall & Kousha, 2016: 468). The high level of interest in writers since 2015 from librarians and professionals in the information field tends to be widely cited, especially co-authors with colleagues from their institutions, most of which are published in English (Prieto-Gutiérrez, 2019: 60-64). ResearchGate provides a large amount of reputation data, although sometimes confusing with alternative engagement metrics implementations, can also lead to reputation anomalies and is also highly associated with scholars (Nicholas et al., 2016: 173-182). Questions on ResearchGate are positive action-oriented to attract other readers; scientists recommend answers with optimistic procedural pronouncements or negative action-appeared statements and advise the questioner on how arranging question descriptions can strengthen the impact of the question. The answerer needs to set the length of the answer, which will be more likely to be a recommendation answer (Shenglia et al., 2019). ResearchGate is closely related to Google Scholar citations. This shows that ResearchGate does not dominate in utilizing data sources fundamentally different from Google Scholar, and preprint sharing are pretty substantial for authors (Thelwall & Kousha, 2017: 1125).

This study develops the Usability dimension into a media platform or website measurement model for the effectiveness of use. The model itself is constructed and connected through structure, content, and form parameters and has meaning with specific limitations (boundary) (Husain, 2019: 1-9). The design or design of the research model is proposed as follows:

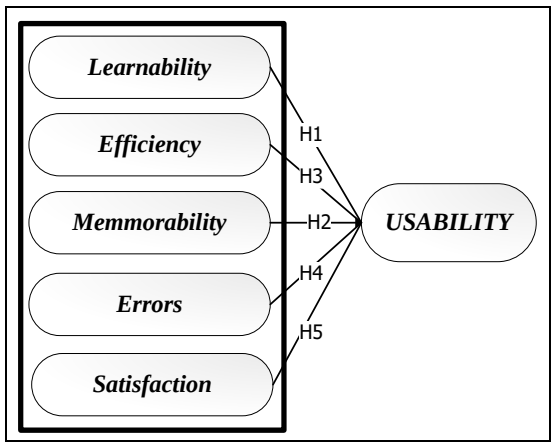

Fig 1. Research Model Proposed. *Source*: (Nelson, 2012; Abdul, 2019)

The hypothesis proposed in this research model can be stated as follows:
H_1 = Learnability has an impact on Usability

H_2 = Memorability has an impact on Usability
H_3 = Efficiency has an impact on Usability
H_4 = Errors impact Usability
H_5 = Satisfaction has an impact on Usability

Methodology

Research Design

This study is designed to describe the relationship between the factors that have been recognized and are very important for comprehending the research issue (Supranto & Limakrisna, 2019). The following initial study is causality type research with a quantitative approach. The development of the model is, of course, based on the problem to be solved with the following stages:

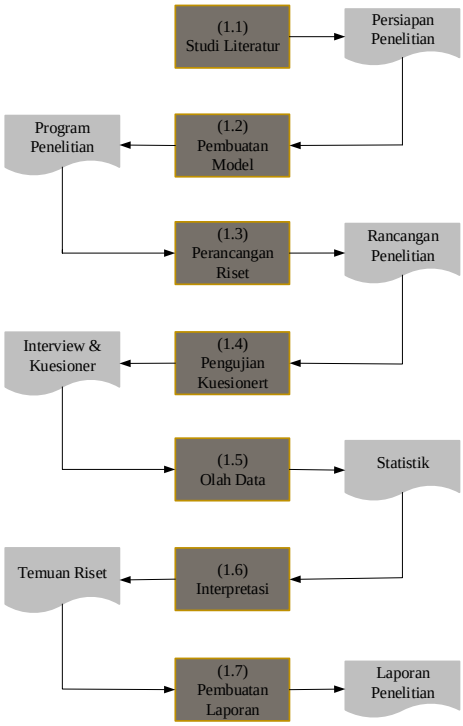

Fig 2. Research Stages

The research instrument with the type of survey research uses a device to measure a phenomenon. The number of research instruments depends on the number of research variables that have been previously determined. The instrument in this study used tools in a questionnaire. The research instrument consists of: (1) A questionnaire that uses 4 (four) Linkert scales starting from “Strongly Disagree”, “Disagree”, “Agree”, and “Strongly Agree”. The instrument displayed consists of a cover letter for research, a research summary page, a research question page which will consist of 3 (three) questions with details on gender, age, and origin of the region or country (respondent profile), 2 (two) profile questions usage includes the length of time spent accessing ResearchGate and the ResearchGate features that are perceived to be the most important as well as 17 (seventeen) questionnaire testing questions. (2) This research will also involve 2 (two) academics in the field of Information Systems who can provide input on additional instruments used later.

Variable Definition and Operationalization Design

1. Learnability (X_1)

Describes the level of ease of learning the website to fulfill basic tasks when first using the service/platform.

2. Memorability (X_2)

Explain the ease of users using the service/platform well since a long period of not utilizing it.

3. Efficiency (X_3)

Describes the user's level of speed in completing tasks after learning the service/platform.

4. Errors (X_4)

Explains how users make sufficient errors and how users can quickly fix mistakes.

5. Satisfaction (X_5)

Explain the level of user satisfaction in using the service/platform

6. Usability

(Nelson, 2012; Abdul, 2019)

All research variables are derived, each using 4 (four) indicators in operationalization

Sample Technique

The criteria that will be considered (judgment) to provide generalizable results with a minimum representative sample are set with the following criteria: (1) users who have used ResearchGate for at least 1 (one) month so that they can understand well the features contained in ResearchGate; (2) users spend at least 30 (thirty) minutes in maintenance and discussion in one login frequency; (3) the user's primary purpose is to index articles to Google Scholar accounts and document them. According to Rescue recommends, reasonable sample size in a study is betwixt 30 and 500. However, in multivariate studies (puts in multiple regression analysis), the sample size must be ten times larger than the amount of variables in the research (Sugiyono, 2018). Therefore, the number of samples collected during this initial stage, namely 33 respondents, has met the minimum criteria used in this analysis

Data Analysis

Data analysis used a multivariate analysis (multiple linear regression) to prove the construct formulated in this study. Analysis of this data using the help of quantitative statistical software.

Results

Demographic Information

The questionnaires were collected in initial phases as many as 50 respondents. However, the distribution of questionnaires must fulfill proviso an active ResearchGate Account of at least 1 (one) month. Therefore, only 33 respondents of total data were collected, or have a response rate of 66 percent of the questionnaire distributed and returned. By utilizing the information acquired in the demography respondent, the majority gender has a woman as 56 percent who 88 percent of them live in Jabodetabek area and the Java Island with an age of majority about betwixt in 31 until 40 years old as 54 percent. The majority of respondents' professions (functional positions) are Lector Assistant and Teaching Staff, respectively 44 percent and 26 percent, with 90 percent of them accessing time spent using ResearchGate among less than 1 hour until 2 hours. The features that are considered important by the majority of

respondents are sharing articles and connecting with collaborations and colleagues, which is 70 percent. While the average indexation of scientific article publications to Google Scholar is still mostly perceived by respondents for more than 2 weeks.

Based on this general description of information, it can be seen that the lecturers who are respondents are still not fully connected to the ResearchGate account in their daily lives, where the access used on this account is still limited to finding friends and colleagues and author collaboration on scientific papers and few of them use the feature. ResearchGate for additional features such as Follow, Statistics & Metrics, Like | Recommend, Chat, Question, and Job.

Data Validity and Instrument Reliability

1) *Data Validity*

Data validity aims to ensure that the items entered in the questionnaire and tested have a level of accuracy, with the requirement that the $R\text{-}_{Score}$ must be greater than the $R\text{-}_{Table}$. $R\text{-}_{Table}$ (2-tailed) with 33 samples obtained by 0.3673.

Table 1. Recapitulation of Data Validity Scoring

Construct	Item Symbol	$R\text{-}_{Score}$	Item Validity Results
Learnability	$X_1.1$	0.867	valid
	$X_1.2$	0.871	valid
	$X_1.3$	0.756	valid
	$X_1.4$	0.780	valid
Memorability	$X_2.1$	0.759	valid
	$X_2.2$	0.833	valid
	$X_2.3$	0.751	valid
	$X_2.4$	0.763	valid
Efficiency	$X_3.1$	1.000	valid
	$X_3.2$	0.640	valid
	$X_3.3$	0.782	valid
	$X_3.4$	0.737	valid
Errors	$X_4.1$	0.811	valid
	$X_4.2$	0.875	valid
	$X_4.3$	0.745	valid
	$X_4.4$	0.684	valid
Satisfaction	$X_5.1$	0.744	valid
	$X_5.2$	0.829	valid
	$X_5.3$	0.796	valid
	$X_5.4$	0.805	valid
Usability	Y1	0.821	valid
	Y2	0.861	valid
	Y3	0.937	valid
	Y4	0.858	valid
Source: Author's Elaborate (2021)			

Table 1 above shows the data validity test produces scoring of ($R\text{-}_{Score}$) from each of an item which higher than R-Table in the count of 0,367. It implies that the assumption of data validity is fulfilling or the items in measuring each construct are valid.

2) *Instrument Reliability*

Instrument reliability aims to ensure that the construct proposed becomes the variable and after testing has good reliability and requires that the Cronbach's Alpha score before significant than 0.70.

Table 2. Recapitulation of Instrument Reliability Scoring

Variable	*Cronbach's Alpha*	Instrument Reliability Results
Learnability	0.837	reliable
Memorability	0.775	reliable
Efficiency	0.729	reliable
Errors	0.782	reliable
Satisfaction	0.809	reliable
Usability	0.892	reliable
Source: Author's Elaborate (2022)		

Table 2 above shows the instrument reliability test produces scoring of Cronbach's Alpha from each of variable which higher than 0,7. It implies that the assumption of instrument is fulfilling requisite or the construct proposed is reliable.

Classical Assumption Test

1) *Data Normalcy*

Data normalcy identified by viewing the output in the interface of a histogram from the runs program in consorted as follows:

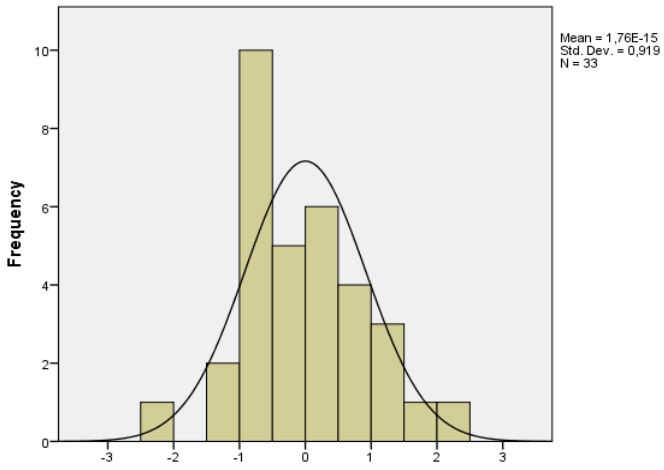

Fig 3. The shape of Histogram from processing output

An asymmetrical graph called a bell curve shows the histogram derived from the processing output in this research exhibits the curve will culminate in half and incline on both sides by same values.

2) *Data Multicollinearity*

Data multicollinearity identified by viewing the output in the interface of a tolerance and variance inflation factors (VIF) scores is fulfilled, if higher than 0.1 and lower than 10 (ten) in consorted as follows:

Table 3. Data Multicollinearity Yields

Model Testing		Collinearity Statistics Scoring	
		Tolerance	VIF
1	Learnability	0.173	5.790
	Efficiency	0.216	4.619
	Memorability	0.217	4.610
	Errors	0.287	3.480
	Satisfaction	0.352	2.844
Source: Processing Output (2022)			

Table 3 above exhibits the tolerance score of the independent variable higher than 0.1 whilst the VIF score is less than 10 (ten); thus, there is no multicollinearity matter in the regression model among the variables above.

3) *Data Heteroscedasticity*

Data heteroscedasticity was identified by viewing the output in the interface of a pattern of dots on the regression scatter plots in consorted as follows:

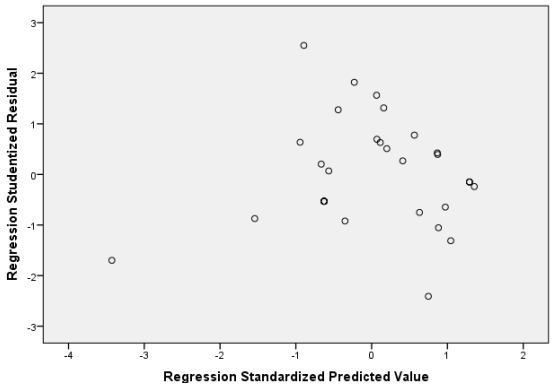

Fig 4. The data spread of Scatter Diagram from processing output

The regression scatters diagram signifies no symptom of heteroscedasticity if there is no clear scheme, such as the dispersion of the points above and under the number 0 on the Y-axis.

Hypothesis Test

1) *Result of Regression Equation*

The result of regression utilizes determining the core variables that influence a dependent variable, modeling, and estimation or forecasting which processed output program as follows:

Table4. Recapitulation of Linear Regression Scoring

Variable	Regression Score	Significant Score	Inference
Constant	2,525	0.237	
Learnability (X_1)	0.524	0.100	H_1 Reject
Memorability (X_2)	-0.090	0.766	H_2 Reject
Efficiency (X_3)	0.356	0.196	H_3 Reject
Errors (X_4)	-0.246	0.375	H_4 Reject
Satisfaction (X_5)	0.312	0.185	H_5 Reject
Source: Author's Elaborate (2022)			

Table 4 above shows the linear regression equation is computed as follows:

$$Y = 2.525 + 0.524X1 - 0.090X2 + 0.356X3 - 0.246X4 + 0.312X5$$

A regression scoring from an elaborate output program shows that X_1, i.e., Learnability has a probability score is 0.100, X_2, i.e., Memorability has a probability score as 0.100, X_3, i.e., Efficiency has a probability score as 0.766, X_4, i.e., Errors has a probability score as 0.375, and X_5, i.e., Satisfaction has a probability score as 0.185. Overall construct produced probability is more than 0.05; thus, on the whole, the yield is no effective, i.e., toward explaining the role of usability impact a ResearchGate in a scientific paper publication (H_1; H_2; H_3; H_4; H_5 is Rejected).

2) *Result of Determination Correlations and F-Tests*

The result of regression utilizes determining the core variables that influence a dependent variable, modeling, and estimation or forecasting which processed output program as follows:

Table 5. Recapitulation of Determination and F-Tests

	Scoring			
	(*Adj.*) Determination of Coefficients	F-Stats	Significant Probability	Results
Model	0.547	8.739	0.000	H_A Accept
Source: Author's Elaborate (2022)				

Table 5 above shows the determination scoring from an output program have an adjusted score is 0.547; thus, on the whole, the contribution of Usability, which is determined by Learnability, Memorability, Efficiency, Errors, and Satisfaction, is 54,7 percent. The remaining score is 45,3 percent is affected by outside construct in a regression model. F-statistics is 8.739, or significant of probability has less than 0.05, i.e., 0.000. This argument informed Usability ResearchGate as a scientific paper simultaneously has significantly implied.

Conclusion

This initial survey's conclusions are 1) Learnability, Memorability, Efficiency, Errors, and Satisfaction have no implication in partially to gauge Usability in a Scientific Paper Publications; but (2) Learnability, Memorability, Efficiency, Errors, and Satisfaction have significance in simultaneously to measure Usability in a Scientific Paper Publications with contribution point of 54.7 percent; it meanings that strong enough.

Further research should be carried out and becomes very important considering that the features deemed necessary are perceived by respondents in this study only sharing articles and connecting with collaborators and colleagues. The number of samples must be increased to complement the findings of better results in next/future research. The development of research constructs and models can also urgently for implemented.

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