

The Hypothetical Model of Internal Quality Assurance System of Private Higher Education Institutions in Indonesia

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Abstract:

Background: A quality assurance concept is not something new. However, the terminology and methodology recently used to define, develop, and implement the internal quality assurance is relatively new, especially due to the impact of quality assurance system changes at higher education institutions. This research aims at explaining the hypothetical model of internal quality assurance system of private higher education institutions in West Kalimantan Province, Indonesia.

Materials and Methods: The approach used in this research was conducted in two ways based on the research phases; phase one was through questionnaire of internal quality assurance system concept, phase two used the Reviews of Literature Studies (RLS) and phase three used the Focus Group Discussion (FGD).

Results: The developed internal quality assurance system model was divided into 5 process stages; 1) input element-based data collection stage, (2) planning organization stage, (3) implementation stage, (4) evaluation stage, and (5) data organization stage to provide inputs for the sustainable development to improve the quality management of higher education institutions.

The model was developed by considering the main theoretical framework in the implementation of internal quality assurance system set by the government of the Republic of Indonesia minimally consisting of 3 main quality standards (each standard consists of 8 sub-domains that there are 24 minimum standard sub-domains in the field of education, research, and community service).

Key Word: hypothetical Model; Internal Quality Assurance System, Indonesian National Higher Education Standard; Research and Development Model of Higher Education Institutions

Date of Submission: 09-10-2020

Date of Acceptance: 25-10-2020

I. Introduction

The quality assurance system at higher education institutions has become the main foundation for higher education institutions to improve their education service quality[1]. The role of Internal Quality Assurance System (IQAS) at higher education institutions has recently been better and well established. Quality assurance can be described as a systematic, structured and continuously paying more attention to the quality in term of maintaining and improving the management quality of higher education institutions through the implementation of IQAS.

Along with the issued Law Number 20 Year 2003 on National Education System (known as *UU Sisdiknas*), the Directorate General of Higher Education has started implementing the Higher Education Quality Assurance gradually. The Higher Education Quality Assurance aims at ensuring the quality of higher education organizations by the higher education institutions in Indonesia. The Law on National Education System (*UU Sisdiknas*) has started introducing the autonomy of Higher education institutions.

On 16 May 2005, the Government of the Republic of Indonesia has set the Government Regulation Number 19 Year 2005 on National Standard of Education (NSE) which was then amended to the Government Regulation Number 32 Year 2013 and the second amendment through the Government Regulation Number 13 Year 2015. The Article 4 of Government Regulation states that the National Standard of Education aims at ensuring the national education quality. In August 2008, a quality system had been arranged and called the Quality assurance system of Higher education institutions. The issued Law Number 12 Year 2012 on Higher Education (*UU Dikti*) strengthened the Quality assurance system of Higher education institutions implemented since 2008 with its new name called Higher Education Quality Assurance System as one permanent system integrating three pillars: (1) Internal Quality Assurance System (known as *SPMI*) implemented by each Higher education institution; (2) External Quality Assurance System (known as *SPME*) or Accreditation performed by the Higher Education Accreditation Body or Independent Accreditation institution (3) Higher Education Database (known as *PDPT*). Those three aspects should be mutually operated by the Study Programs and

Higher education institutions. In some Higher Education Institutions, the most important one was their External Quality Assurance System (SPME) or Accreditation. Meanwhile, the Internal Quality Assurance System (SPMI) and Database were frequently forgotten. In that related Law, the Internal Quality Assurance System (SPMI) process should be performed by the higher education institutions minimally once a year. The Internal Quality Assurance System (SPMI) should encourage the External Quality Assurance System (SPME) to be better than eventually the quality assurance is not only considered as one administrative requirement. Accreditation is not only ranking, but also as an effort to fulfill the Higher education standards[2]. The regulation related to the quality assurance system in Indonesia has continuously developed and recently renewed with the Ministry of Education of the Republic of Indonesia Regulation Number 3 Year 2020 on Minimum Quality Standards should be implemented by the higher education institutions in Indonesia:

1. The National Standards of Education consist of:
 - a. graduate competency standards;
 - b. learning content standards;
 - c. learning process standards;
 - d. learning education assessment standards;
 - e. lecturer and Educational Staff standards;
 - f. learning facility standards;
 - g. management standards; and
 - h. learning financing standards.
2. Research standards consist of:
 - a. research result standards;
 - b. research content standards;
 - c. research process standards;
 - d. research assessment standards;
 - e. researcher standards;
 - f. research facility standards;
 - g. research management standards; and
 - h. research funding and financing standards.
3. Community service standards consist of:
 - a. community service result standards;
 - b. community service content standards;
 - c. community service process standards;
 - d. community service assessment standards;
 - e. community service implementation standards;
 - f. community service facility standards;
 - g. community service management standards;
 - h. community service funding and financing standards.

The private higher education institutions in West Kalimantan as a part of national education system in Indonesia have implemented the Quality Assurance System. The higher education institutions in Indonesia in 2020 have reached a total of 4.782 higher education institutions including 46 higher education institutions in West Kalimantan Province. The form of higher education institutions in West Kalimantan Province consists of 5 universities, 2 institutes, 19 colleges, 2 polytechnics, and 18 academies. Those higher education institutions have performed their internal and external (accreditation) quality assurance [3].

The main problem found at the private higher education institutions in West Kalimantan was less effective implementation of internal quality assurance system as reflected in the accreditation result of higher education institutions in West Kalimantan in which only 17 higher education institutions got good (B) accreditation, while the other 29 higher education institutions had fair (C) accreditation [3]. This research aims at explaining the hypothetical model of internal quality assurance system of private higher education institutions in West Kalimantan province, Indonesia.

The Internal Quality Assurance in Higher Education

Quality Assurance (QA) has been rapidly developed at the higher education sector since 1990's [4], [5]. One important development at the higher education QA is the formation of International Network of Quality Assurance Agencies in Higher Education (INQAAHE), which membership has increased from eight in 1991 to 177 in 2017. INQAAHE is a global network of External Quality Assurance (EQA) Body for Higher Education Institutions. The main impact of EQA body is the introduction of Internal Quality Assurance (IQA) at the institution level[6]. IQA refers to the policy and practice used by the higher education institutions to monitor and improve their education service quality, while the EQA refers to the policy and practice of supra-

institutionalization where the quality of higher education institutions and the guaranteed program [7]. Both EQA and IQA form the ecosystem of QA mechanism at higher education.

Understanding IQA, especially purpose, instrument, and process, is the central development of IQA model [8]. One important development in higher education is QA institutionalization (Such as generic names in Indonesia: *Kantor Penjamin Mutu* [Quality Assurance Office], *Lembaga Penjaminan Mutu* [Quality Assurance Institution], *Lembaga Audit Mutu* [Quality Auditing Institution]. Various driving powers have made IQA as the global transformation trend at higher education institutions (Martin, 2018). As previously stated, IQA refers to the institutional regulation for quality management [7]. The main function of IQA at higher education institutions is to regulate the quality cycle related to the function of three higher education main pillars (*tridharma*) (education and teaching, research, community service), partnership and the following supporting infrastructures. The quality cycle consists of planning, implementation, evaluation, and performance improvement of higher education institutions. A research conducted by [9] involving 311 institutions from 94 countries throughout the world has provided valuable insights on IQA purposes. According to the research conducted by [9], the most significant IQA purpose covers the academic activity improvement, obedience to the external standard and accountability to the government and society. To reach the IQA purposes, Higher education institutions utilized various Models of Quality Management System (QMS) consisting of Total Quality Management (TQM), ISO 9000 series, European Foundation for Quality Management Excellence Model (EFQM), Balanced Scorecard (BSC), Malcolm Baldrige, and SERVQUAL [10], [11].

The main responsibility of IQA unit is to monitor the implementation of Quality Management System at Higher education institutions. Various instruments and processes are used for the processes of internal quality assurance system of higher education institutions in Indonesia, such as evaluation, review, quality audit, benchmarking (partnership) and sustainable improvement [12].

System Modeling Concept

Each theory depends on the general models to formulate the theoretical concept. In more general level, those concepts are less explicitly formulated, yet still used to determine the concepts at the lower levels. Those category determinisms stretched from the metaphysical and epistemological levels through the scientific theories to the ways how to analyze, interpret, and draw conclusion from the empirical evidence. The most general model considered as "paradigm" [13], "pre-assumption" [14], "world view" [13], [15] and "world hypothesis" [16], had the widely spreading influences more specifically to the whole levels, as recorded by [17]; [16]; [18].

Different model levels were characterized by the different, open, unclear general degrees. On one hand, there is an implicit and psychological model including the rarely phenomenon. This metaphysical system is the previously referred world hypothesis. The model is the basic model realistically from the humans' essential characteristics. In the mechanistic world view, the model for all phenomena is machine. Meanwhile in the organism world view, the model is the biological organism and its activity. The less general and less specific, but more explicit is the model called "the nature's dream" or "principle" [18], "science paradigm" [13], and "assumption" [19]. They are not, the model of "philosophy", that is, the model which is not a part of the science logic, but a part of psychology or science pragmatics [14], [20], [21]. On the other hand, the more relatively specific model and mostly connoted with the term "model" is known as the "theoretical" model, intended only to differentiate it from the more general metaphysical and "pragmatic" model. The "theoretical" model covers the scales from general and abstract to specific and concrete, (a) conceptual model formulated only in the verbal language, (b) analog model, and (c) scale model.

The theoretical model is generally agreed by the scientists that general theoretical model is metaphoric (Such as [15], [17], [18], [22]–[26]).

Theoretical model functions:

(1) Representation. [27] described a model, representing the behaviors explained by hypothesis (in term of that used by Krechevsky [28]); the equation referred by Chapanis [23] not a part of this model, yet only explaining how to use it. The analog scale and model represent phenomena, yet only in the simile meaning. The scale model represents the elements and its relationship; analog model only represents the relationship between elements. W. S. McCulloch [29] has asserted that "anything learnt related to organisms makes us conclude that they are not only analog with machine but they are machine (page 39), "and" ... organism, even brain, is machine (page 39),

(2) Implementation. A good model may improve someone's insights. One of its functions is to help the spread and extension of theories [18], [24]. A good model has the function like a telescope. This function is related to "the metaphoric function". The model provides the inferential rules in which the new relation is found and gives some suggestions on how the theoretical coverage can be improved. This function makes a good model not only as a "simple analogy". Such model may function as a shortcut to deduction as the theory from

Black [17]. The model characteristics which enable the users to implement the theory, and improve the coverage, is the model which has "more meaning ", that is, a model consisting of various elements and the interconnected elements.

(3) Evaluation. A model may not be evaluated as the correct or incorrect aspect since a model is based on the metaphor that the function of this model is relative, depending on the condition and time. Thus, the evaluation on a model is pragmatic[18], [24]. A model is considered improving when meeting its function to what extent a model may reflect the representing reality.

In the IQAS model development, the researchers should have knowledge, skills, and attitudes required to implement the effective quality management at higher education institutions. The IQAS model should be able to explain the main principles to sustainably plan, implement, evaluate, and improve the IQAS model development as the quality management system at higher education institutions.

II. Material and Methods

Subjects & selection method: This research was conducted in 2 phases; first, distributing the questionnaires to 50 respondents from 5 private higher education institutions in West Kalimantan. Those 50 respondents covered the Heads of Higher education institutions, persons in charge at the quality assurance office of each higher education institution, lecturers, and administration staffs.

The second phase was designing the hypothetical model based on the results of questionnaires and literature studies. In the first phase of this research, each questionnaire was organized by questioning 3 IQA main elements consisting of planning, implementation, and evaluation. The questionnaire's validity and reliability had been measured [30], [31] that the values were valid and reliable to be used to build the IQA factual concept parameter.

Procedure methodology: The research method in the second phase used the Review of Literate Studies (SLR) technique with the following working stages: Planning, Conducting and Reporting the IQA model just like the research process developed by [32]–[34]. After the hypothetical model was formulated, it was followed by the last stage of this research, namely FGD [35] by involving 8 experts in the field of quality assurance in Indonesia.

This research was classified into a Research and Development (R&D) study. The Research and Development study would result in a feasible and interesting product, and be possibly implemented as the quality assurance development model at higher education institutions. The education development research covered the development process and product validity as well as some stages required in its processes. Referring to the stages proposed by Gall & Borg [36], those development stages were simplified into seven steps: (1) Literature Studies; (2) Need Analysis; (3) Preliminary Research; (4) Initial model Design Organization; (5) limited Trial and extension; (6) hypothetical model organization; (7) Model Validation. Those seven steps were the classified into three phases: (1) preliminary studies and factual concept parameter survey phase; (2) hypothetical model development phase; (3) feasibly implemented model validation phase. The preliminary studies phase was conducted to achieve the first purpose, the model development phase was to achieve the second research purpose, and the model trial phase was to achieve the third research purpose. The research procedures were presented in Figure 1.

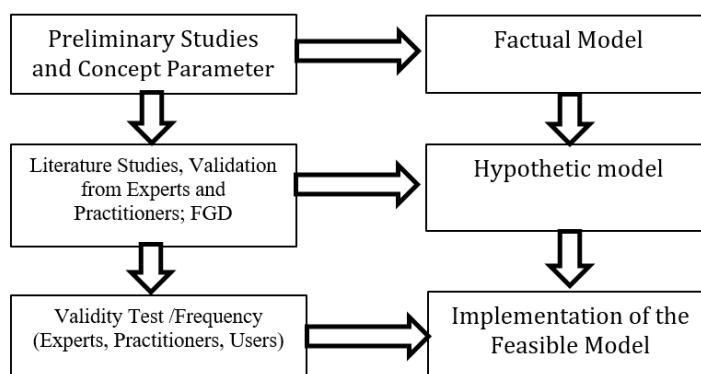


Figure 1. IQA Research Procedure and Hypothetical Model Development (Adopted from Gall and Borg [36] simplified by the researchers)

The research implementation processes and this IQAS model development form a cycle started by conducting a preliminary research. The preliminary research consisted of three stages: (1) literature studies on higher education quality assurance; (2) need analysis on higher education institutions related to the IQAS Model; and (3) field study. The next step was the development stage. In this stage, the factual model design was

based on the literature studies and previous researches in which the researchers have developed into a hypothetical model. In the third stage of model development processes, this hypothetical or constructive model was consulted to the experts and practitioners implementing the higher education quality assurance through *focus group discussion* (FGD). After the model design was validated by the experts and practitioners, the weaknesses of this hypothetical model were revealed and then improved for betterment.

III. Result

The research results were presented in the form of factual model by including the following elements: 1) internal quality planning, 2) quality planning, follow up, and evaluation, and 3) sustainable quality improvement. The Process of internal quality assurance system based on the data processing results of frequency test on questionnaires distributed to 50 respondents from 5 higher education institutions showed responses with highly disagree by 0%, disagree by 4.4%, neutral by 8%, agree by 24.4%, and highly agree by 63.2%. Thus, it can be said that most respondents agreed with the implementation of quality assurance at higher education institutions.

The development of this IQAS Hypothetical model was based on the sustainable improvement cycle by adopting the model of Deming Continuous Improvement Cycle[37], Figure 2.

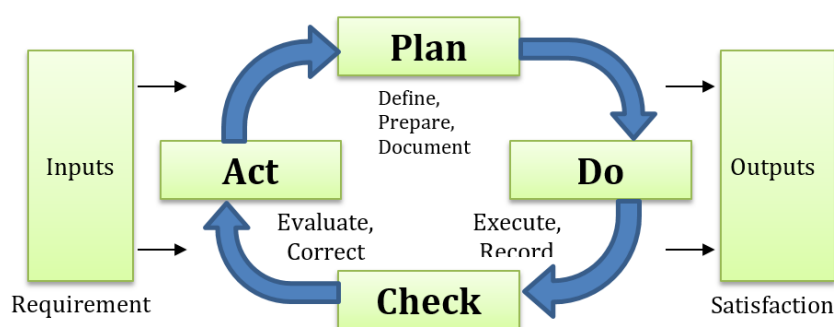


Figure 2. Deming PDCA

The developed Deming Continuous Improvement Cycle (Figure 2) was based on the following stages:

- Doing the inventory of various inputs influencing the implementation of internal quality assurance system at higher education institutions
- IQAS Planning organization
- IQAS Implementation organization
- IQAS evaluation organization
- Making the IQAS constructive model

The main modeling principle is the existence of input, process, and result (output). Consistent to the findings in the factual model and based on the development theory, the IQAS model development was then organized. The main elements of IQAS Model: (1) power collection stage as the IQAS inputs; (2) IQAS planning, (3) IQAS Implementation, (4) IQAS evaluation, and (5) sustainable improvement stage (IQAS Kaizen).

The input elements of the IQAS development at higher education institutions consist of:

- Higher Education National Standards
- Commitment
- Vision, missions, and purposed of higher education institutions
- Self-evaluation
- Partnership

The IQAS planning elements at higher education institutions which were based on the documents which must be provided in developing the IQAS at higher education institutions consist of:

- IQAS Policy
- IQAS Manual
- IQAS Standards; minimally 3 main standards consisting of education, research and community service standards which each consists of 8 sub-domain standards set by the Government of the Republic of Indonesia;
- IQAS Form

The implementation elements in IQAS development consist of:

- Information Technology
- Budget

- 3) Organization
 - 4) Implementation
- IQAS Evaluation Elements at higher education institutions consist of:
- 1) Control and evaluation
 - 2) Internal quality assurance

Standard improvement elements (IQAS Kaizen). By following the Plan-Do-Check-Act (PDCA) cycle, the processes were well defined and documented, operated and the results were measured and continuously evaluated to get the opportunities in improving the quality management standards at higher education institutions. Better understanding on how those processes operated enable the researchers to see whether the corrective actions and improvements were needed. Whenever the corrective actions are needed, the implementation method should be well determined covering identification and deletion of problem causing roots (such as mistakes, flaws, and inadequate process control). The effectiveness of the taken actions should be well reviewed. Implementing the corrective actions and verifying the effectiveness should be based on the plan. When the planned process results were reached and met the requirements, the organization should focus on its efforts to continuously improve the process performance to the higher levels.

This research determined the qualification of experts and practitioners (model prospective users) to validate, criticize, and suggest the improvement required to the developed model. The developed model was completed based on data analysis and synthesis collected through documents and interviews during the research processes. To measure the model feasibility, the frequency test was performed. The improvement of the developed model was systematically made. This systematic improvement positively impacts on the model appropriateness and completeness.

The data sources in the development of hypothetical model were the theoretical studies and previous researches, IQAS factual model at higher education institutions. Data feasibility and validity were conducted through triangulation test with the experts and practitioners during the FGD. The data analysis technique was conducted by collecting, reducing, and presenting the data. The hypothetical model developed in this research was presented in Figure 3 as follows:

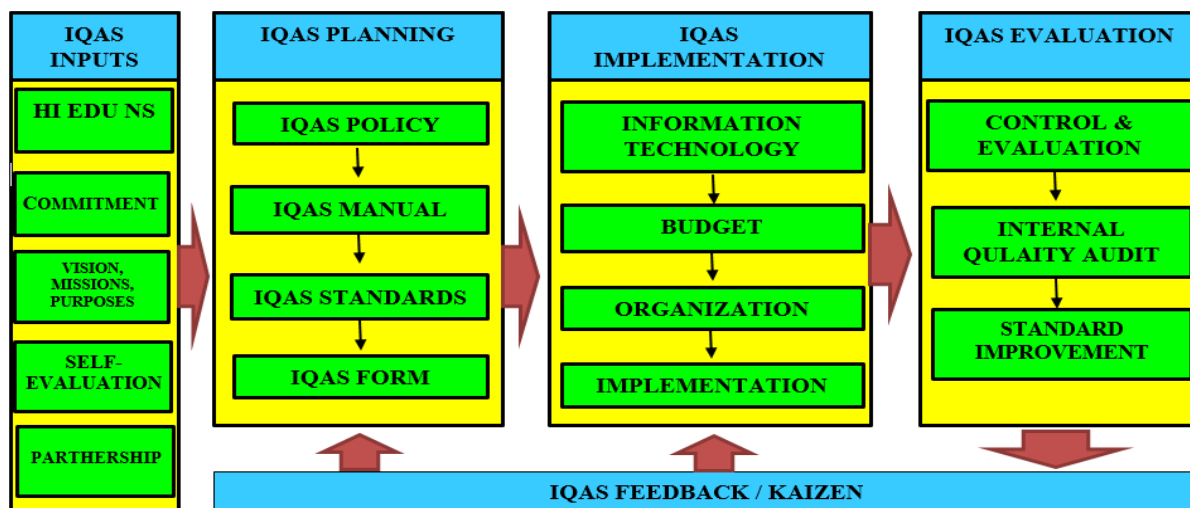


Figure 3: Hypothetical Model of Internal Quality Assurance System

IV. Conclusion

Although there is no appropriate IQAS model for all higher education institutions, a generally good practice shows that the development of IQAS model possibly has a good function. The private higher education institutions in West Kalimantan have strived to improve their higher education quality. The higher education institutions have sustainably developed many quality development programs. The higher education institutions in Indonesia have formed special working units for their quality assurance.

Quality assurance is not a concept which can be qualified as good or bad. Each institution has set the IQAS based on their internal structures in using the standards and concepts. However, the emphasis should be given to the establishment, assurance, and evaluation standards. The standards help enrich the quality system, key improvement and better market position in a higher education institution system. Sustainable quality assurance first starts from the IQAS at the level of study program, higher education institution, and external quality assurance (EQAS).

The hypothetical model resulted from this research can be used as the guidance to implement the IQAS at higher education institutions. Although this model's feasibility has been tested and the results are also possibly implemented at private higher education institutions in Indonesia, the main weakness of this model is that it is still in the form of prototype or hypothetical model which has not been reliably tested when implemented at higher education institutions since the implementation of this model at least requires a time period of 1-2 years.

References

- [1] A. Mursidi, A. Slamet, T. J. Raharjo, and A. Rifai, "Embedding a Mental Attitude to Build Quality Culture in STKIP Singkawang Using DIECU Model," in *Proceedings of the 2018 International Conference on Education Technology Management*, 2018, pp. 24–27.
- [2] A. Mursidi, D. Sundiman, and S. Sabran, "Model Of Internal Quality Assurance System (SPMI) In STKIP Singkawang," *Sinergi J. Ilm. Ilmu Manaj.*, vol. 8, no. 1, 2018.
- [3] Higher Education Database (Pangkalan Data Perguruan Tinggi), "No Title," 2019. [Online]. Available: <https://pddikti.kemdikbud.go.id/>.
- [4] C. Jordan, "fessionalism, Profession and Quality Assurance Practitioners in External Quality Assurance Agencies in Higher Education," *ality High. Educ.*, vol. 21, no. 2, pp. 1–20, 2015.
- [5] A. Hou and Yung-Chi, "Is the Asian Quality Assurance System for Higher Education Going Glonacal? Assessing The Impact of Three Types of Program Accreditation On Taiwanese Universities," *Stud. High. Educ.*, vol. 40, no. 1, 2015.
- [6] Lange and Kriel, *Integrating internal quality assurance at a time of transformation: University of the Free State, South Africa*. UNESCO: IIEP, 2017.
- [7] D. Dill, *Quality Assurance in Higher Education: Practices and Issues, International Encyclopedia of Education, Third Edition*. Oxford, 2010.
- [8] A. Mursidi, E. Murdani, I. Ting, and J. C. Wu, "Development of internal quality assurance model in higher education institution," *Proc. 10th Int. Conf. E-Education, E-Business, E-Management E-Learning*, pp. 264–269, 2019.
- [9] M. Martin, *Internal Quality Assurance: Enhancing higher education quality and graduate employability*. 2018.
- [10] N. Becket and Brookes M, "Evaluating Quality Management in University Departments," *Qual. Assur. Educ.*, vol. 14, no. 2, pp. 123–142, 2006.
- [11] F. Niedermeier, "Designing Effective Quality Management Systems in Higher Education Institutions," in *Module 1. Training on Internal Quality Assurance Series*, 2017.
- [12] A. Mursidi, T. J. Raharjo, Sugiyono, and A. Yulianto, "Factual Model of Internal Quality Assurance System of Private Higher Education Institution in Indonesia," *J. Educ. Teaching, Learn.*, vol. 5, no. 1, pp. 46–52, 2020.
- [13] T. S. Kuhn, *The Structure of Scientific Revolution*. Leiden, 1961.
- [14] P. Arthur, "Are All Necessary Propositions Analytic?," *Philos. Rev.*, vol. 58, pp. 299–320, 1949.
- [15] P. Seeger, *Turn! Turn! Turn! [Recorded by The Byrds]. On Turn! Turn! Turn! [record]*. Hollywood: CA: Columbia Records, 1954.
- [16] S. C. Pepper, *World hypotheses: A study in evidence*. Berkeley, 1942.
- [17] M. Black, *Models and Metaphors: Studies in Language and Philosophy*. Madrid: Cornell University Press, 1962.
- [18] S. Toulmin, *Reasoning in Theory and Practice*. Dordrecht: Springer, 2006.
- [19] A. Kaplan, *The Conduct of Inquiry*. San Francisco: CA: Chandler, 1964.
- [20] G. Bergmann, *The Metaphysics of Logical Positivism*. Longmans, Green & Co, 1954.
- [21] H. Margenau, "Quantum Mechanical Description," *Phys. Rev.*, vol. 49, 1954.
- [22] R. Braithwaite, *Scientific explanation; a study of the function of theory, probability and law in science*. Cambridge University Press, 1953.
- [23] A. Chapanis, "Men, machines, and models," *Am. Psychol.*, vol. 16, no. 3, pp. 113–131, 1961.
- [24] S. J. Lachman, "A Coercive Thermal Stimulus and an Observation on Convulsive Behavior," *Psychol. Rev.*, vol. 6, pp. 251–254, 1960.
- [25] N. Rashevsky, "Live, Information Theory and Topology," *Bull. Math. Biophys.*, vol. 17, no. 3, pp. 25–78, 1955.
- [26] D. Schon, *Schon's Epistemology of Reflective Practice*. London, 1963.
- [27] M. Levine, G. Spivack, J. Fusvhillo, and A. Taavernirt, *Intelligence, and measures of inhibition and time sense*. 1959.
- [28] I. Krechevsky, "Hypotheses," *RATS*, vol. 39, no. 6, pp. 516–532, 1932.
- [29] W. S. McCulloch, *Modes of Functional Organization of the Cerebral Cortex*. 1947.
- [30] J. Oluwatoyo, "Validity and reliability issues in educational research," *J. Educ. Soc. Res.*, vol. 2, pp. 391–400, 2012.
- [31] K. Engellanti, D. Holland, and R. Piper, "Assessing Convergent and Discriminant Validity of the Motivation Construct for the Technology Integration Education (TIE) Model," *J. High. Educ. Theory Pract.*, vol. 16, pp. 37–50, 2016.
- [32] B. Kitchenham, *Procedures for Undertaking Systematic Reviews*. Australia: Keele University, 2004.
- [33] B. Kitchenham, "Systematic literature reviews in software engineering – A systematic literature review," *J. Inf. Softw. Technol.*, vol. 51, no. 1, pp. 7–15, 2009.
- [34] D. Cruzes and T. Dybå, "Research Synthesis in Software Engineering: A Tertiary Study," *Inf. Softw. Technol.*, vol. 54, pp. 440–455, 2011.
- [35] T. O. Nyumba, K. Wilson, C. J. Derrick, and N. Mukherjee, "The Use of Focus Group Discussion Methodology: Insights from Two Decades of Application in Conservation," vol. 9, no. 1, pp. 20–32, 2018.
- [36] M. Gall, J. Gall, and R. Borg, *Educational research an introduction (8th ed.)*. New York, 2007.
- [37] M. Sokovic and D. Pavletic, "Model DMAIC; Define, Measure, Analyze, Improve, and Control; Quality Improvement – PDCA Cycles DMAIC and DFSS," *J. Mech. Eng.*, vol. 53, no. 6, pp. 369–378, 2007.

Andi Mursidi, et. al. "The Hypothetical Model of Internal Quality Assurance System of Private Higher Education Institutions in Indonesia." *IOSR Journal of Research & Method in Education (IOSR-JRME)*, vol. 10, no. 5, 2020, pp. 32-38.