
Internal Quality Assurance of Higher Education Using a Soft Systems Methodology Approach

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Abstract

Higher education in Indonesia is under pressure from various parties. Apart from the government, strong pressure came from stakeholders. In the midst of this situation, higher education increasingly resembles a business operation, where competition is a key factor. With the increasing cost of higher education, various parties demand the need for accountability for higher education. The higher education accounting system is a consequence of the marketization of the university. Higher education accountability aims to ensure the quality of education in fulfilling all Quality Assurance standards required in the National Quality Assurance Framework for Higher Education. From the results of the evaluation by the Ministry of Research, Technology and Higher Education in 2018, it shows that 46% of universities in Indonesia do not have data / output evidence of the implementation of internal quality assurance and this has always been a problem from year to year. This article aims to conduct a reflective review of the internal quality assurance system applied in higher education in Indonesia. This study used the Soft Systems Methodology approach by conducting case studies, that is by comparing two internal quality assurance systems in two different universities. College A is a university that has the accreditation status of institution A (Very Good), while college B is a university that has received the accreditation status of institution C (Sufficient). This study shows how the SSM method can be used by universities for comprehensive evaluation and improvement of the university's internal quality assurance system. The results of this study are a conceptual model of internal quality assurance and recommendations for improvement of the existing system.

Keywords: Accountability; University; Higher Education Institutions (HEIs); Internal Quality Assurance; Soft Systems Methodology.

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1. Introduction

Higher education is under pressure from various parties. Apart from the government, strong pressure comes from other stakeholders, such as the Accreditation Institute which requires higher education to full certain standards, national and global higher education rating organizations, and even parents and students themselves. In the midst of this situation, higher education increasingly resembles a business operation, where competition is a key factor [1]. In addition, the increasing cost of higher education, the various questions about academic quality, skepticism about the value of a four-year bachelor's degree are growing in society. This has led to demand from both government and society for the need for accountability for higher education [2,3]. Accountability in higher education is determined by implementing certain accounting and reporting system. The higher education accounting system is a consequence of the marketization of universities [1]. Higher education accountability aims to ensure the quality of education in fulfilling all Quality Assurance (QA) standards required in the National Quality Assurance Framework for Higher Education. For example, the official commitment to higher education in Europe is contained in an Internal Quality Assurance (IQA) document or policy [4], the same commitment to higher education in Africa is contained in the African Standards and Guidelines for Quality Assurance in Higher Education (ASG-QA) [5]. Quality assurance in higher education in Europe is one of the cornerstones of the Bologna agenda and the Lisbon strategy, which aims to build the world's most competitive knowledge economy [6]. For Indonesia, realizing that higher education has an important role in producing quality human resources, the external and internal quality assurance of higher education is stipulated in a law on the National Education System [7]. However, this law cannot guarantee that the implementation of the procedures contained therein for internal improvement and the success of universities in Indonesia can be carried out smoothly and well. Evaluation of research conducted by Probowo and his colleagues [8] on the implementation of the Quality Assurance System in Indonesian Higher Education shows that 60% of the 105 higher education questionnaires processed, 54% have applied the National Higher Education Standards (NHES) although not yet fully. Only about 10% have fully adopted this standard. The number of tertiary institutions throughout Indonesia reaches 4670 higher education [9]. So, if the 10% figure is used as a benchmark for the national scale, then there are only around 467 tertiary educational institutions that actually have good internal quality assurance. This situation shows that there is a big problem in the internal quality assurance of higher education in Indonesia. This article aims to conduct a reflective review of internal quality assurance applied in higher education in Indonesia. To summarize all the problems related to internal quality assurance, this study used a Soft Systems Methodology (SSM) approach. This research is a case study, comparing internal quality assurance at two different tertiary institutions. College A gets institutional accreditation status A (Very Good), while college B gets institutional accreditation status C (Sufficient). The results of this study are in the form of a conceptual model and proposals for improving the internal quality assurance system, especially for college B. The using of the SSM method in evaluating and improving the internal quality assurance system of higher education has not been done before. This study shows how the SSM method can be used by higher education for comprehensive evaluation and improvement of the internal quality assurance system in higher education.

2. Literature Review

2.1. Related Works

Several researchers have conducted research related to internal quality assurance. Mursidi and his colleagues [10] conducted a study to explain the factual model and identify the main factors that influence the implementation and development of the quality assurance system for private higher education institutions in West Kalimantan Province, Indonesia. The method used is Research and Development (R&D) to develop models. The factual model obtained consists of three stages, that is planning, implementing, and evaluating the internal quality assurance. From this factual model, it is revealed that the implementation of the internal quality assurance system for private higher education institutions in West Kalimantan Province is not yet fully part of higher education accountability which is oriented towards higher education quality assurance, but rather is a temporary goal, such as the goal of accreditation of higher education institutions. Noda and his colleagues [11] investigated the implementation of internal quality assessment of learning outcomes in Japanese and Taiwanese universities, applying Elken and Stensaker's theoretical framework for 'quality of work'. Both nations offer shared perspectives on the correlations between internal quality assurance and learning outcome assessments. These findings initiate discourse about the purpose of internal quality assurance and warnings against its construction solely in response to external requirements. Vykydal and his colleagues [12] has also conducted research related to the development of quality management systems and assessments in universities. Some of the lessons learned from this research area include the possibility of applying the ISO 9001 standard, as well as the application of an excellence model in response to community demands. Le and his colleagues [13] emphasized the importance of studying the determinants of student satisfaction with the quality of services. This study was conducted using a questionnaire to survey students of the FPT University Da Nang campus. The findings of this study identify the factors and the impact degree of these factors on student satisfaction of facility service quality in private universities. Andleeb and Jusoh [14] disclose all higher education institutions (HEIs) in Pakistan, are accredited by the higher education commission and have formed a directorate of quality assurance to accomplish the quality goal and enforce internal quality assurance (IQA) policies through the quality enhancement cells (QECs). Self-assessment of an academic program is a part of the IQA policy. It includes teaching-learning processes, institutional facilities, process control, computer labs, program mission, objectives, and outcomes. The findings showed based on the top manager's perception, IIQAAPs in HEIs are at a moderate level. Furthermore, based on the student representative's perception, the student satisfaction level was also at a moderate level. The study also found a positive relationship between IIQAAPs and student satisfaction. The same thing was done by [15] who reflected on program self-assessment exercises as part of internal quality assurance procedures. The aim of the reflection is to present a general picture of Bangladeshi higher education through the contextualization of quality assurance initiatives. By analyzing the scope and limitation of quality improvement, this article also proposes how a strong internal quality assurance framework is needed to accelerate the program accreditation process. This article concludes with some recommendations for future revisions to Bangladesh's quality assurance system. Reference [16] reports on the design, development and evaluation of a novel process for quality assurance of assessments for entire educational programmes. The process was developed and tested by multidisciplinary teaching staff and consists of five phases: inventory, analyses, evaluation, planning change and realising change. The process for quality assurance was evaluated in three diverse programmes. The results show that the process forms a solid base for decisions on short-term as well as long-term quality improvements. Reference [17] offers a mixed-method perspective on the investigation of determinants of effectiveness in quality assurance at higher education institutions. Survey data collected from

German higher education institutions to analyse the degree to which quality managers perceive their approaches to quality assurance as effective. The results show that support by higher education institutions' higher management and cooperation with other education institutions are relevant preconditions for larger perceived degrees of quality assurance effectiveness. Quality managers' role as promoters of quality assurance exhibits significant correlations with perceived effectiveness. Sanctions and the perception of quality assurance as another administrative burden reveal negative correlations. Khurma and his colleagues [18] identify aspects of the quality assurance model for developing quality professional development content. The research reviewed relevant literature to collect major processes and procedures quality assurers used and followed to enhance the quality of the training content. The results introduce a comprehensive model that includes the overall quality assurance cycle, interaction with other content experts, the characteristics of high-quality content, procedures quality assurers and involved professionals should follow. While Elviwani and his colleagues [19] higher education has difficulty and is very burdened with the accreditation process because the entire process is done manually and problems in quantitative forms, the concept of an artificial intelligence-based internal quality assurance system is proposed. The results of digital data recordings from the internal quality assurance system and the information system center are carried out by a clustering process using the KMeans algorithm and calculating the weight of each criterion using template matching for the process of matching the weighting results to the target. With this system, all academic and non-academic elements in higher education can be improved, evaluated periodically. On the other hand, Reference [20] conducted an exploratory study, a diversionary perspective from organizational studies that was taken to analyze how national accreditation agencies interpret the so-called European Standards and Guidelines (ESG) and adapt them to the domestic context. Data comes from 17 higher education institutions in Croatia, Estonia, Finland and Portugal. Their findings indicate that national quality assurance frameworks often diverge from ESG. Studies related to the using of SSM in the evaluation of higher education have also been conducted by several researchers with different perspectives. Reference [21] conducted a study to explore empirically the factors enabling organizational proficiency in the public sector. This study is a qualitative based on interviews with managers in two public organizations in Sweden. The analysis was performed using SSM. Kashyap and his colleagues [22] conducted a study to explain the role of structured innovation in higher education and provide recommendations to stakeholders. The process consists of comparing reports available in the public domain from several key institutions on factors such as innovation factors, spin-off activities, programs running at Higher Education Institutions (HEIs) and pooling entities such as education and entrepreneurial relation, commercialization and fundraising, intellectual property support to create the relevant framework in the present. SSM is used to implement this parameter in Indian HEIs. This study analyzes the gap between the concerned area of real world systems and conceptual systems. Prowse and his colleagues [23] conducted a study of higher education institutions in the United Kingdom that have tutor-supported learning systems. Private tutors are members of the academic staff who support students to integrate into the university academic community. Prowse and his colleagues [23] used SSM for a thematic analysis of students' perceptions of personalized support for university learning, to explain improvement of design and contribution in the theory of personalized student support mechanisms effectively. Heathcote and his colleagues [24] discussed the using of SSM to explain how systems thinking, policy development, and related supporting techniques can be applied in the field to provide a deeper understanding of student behavior and by extension, an appropriate focus for data provision, enabling

comparative business performance assessments of Higher Education Administrators.

2.2. Soft Systems Methodology (SSM)

Several researchers have conducted research related to internal quality assurance. Mursidi and his colleagues [10] conducted a study to explain the factual model and identify the main factors that influence the implementation and development of the quality assurance system for private higher SSM is a structured and systematic approach to analyze human activity systems such as educational institutions. This approach is very good for studying any organized human activity that is related to each other to achieve certain goals. SSM has been widely applied evaluation in various fields, such as education [25], energy [26], health [27], supply chain [28]. The main objective of SSM is to overcome all kinds of problematic and irregular situations, including social, political and humanitarian problems [26]. SSM consists of seven steps, as shown in Figure 1.

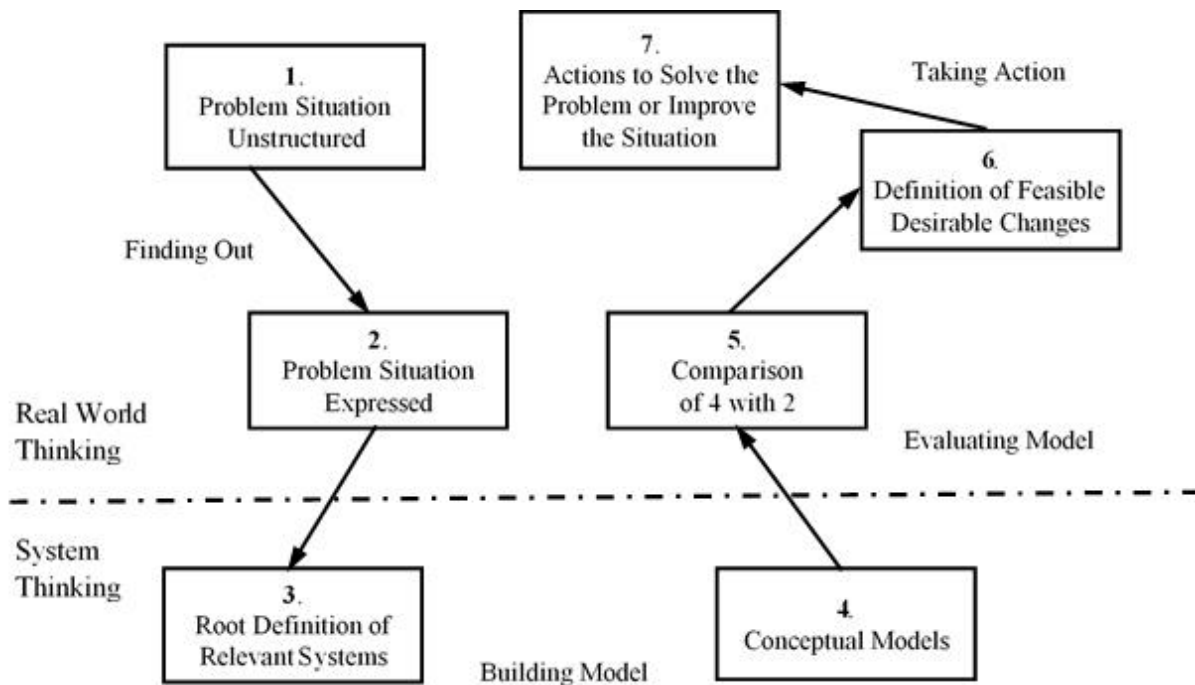


Figure 1: Seven steps of SSM adapted from [29]

Step 1 is a problem situation that starts in the real world. This stage tries to explore and define the problem situation in a certain way. This stage does not define the problem, but tries to assess general areas of potential interest, such as the internal quality assurance system. Step 2 is to express the problem in the form of a rich picture to get a better and deeper understanding of the problem situation. Step 3 is to define the roots of the relevant system. This step moves the real world to the system world. This step seeks to explore multiple perspectives on the same problem, known as 'holons'. Holons depicts real-world activities using rich images. Each of these holons can potentially provide a basis for evaluating any problem situation. From various perspectives, only a few perspectives that are considered important are selected, and place them through a more structured and rigorous model development process through CATWOE. Table 1 shows the form of CATWOE. According to [30], the model development process starts with a 'T' for 'transformation' in CATWOE. The

transform for the selected perspective determines what is actually transformed from input to output. After identifying the transformations that have occurred, the next process is CATWOE (in Table 1).

Table 1: Elements and Description of CATWOE, adapted from [30]

Element of CATWOE	Description
Customer/Client (C)	Who would benefit from transformation?
Actors (A)	Who facilitates the transformation to these customers?
Transformation (T)	From start to finish.
Worldview (W)	What gives the transformation some meaning?
Owner (O)	To who is the system answerable and/or could cause the system to not exist?
Environment (E)	That influence but does not control the system.

Step 4 is to develop a conceptual model. A conceptual model contains the activities that need to be done to define what actors need to do to achieve transformation. Step 5 is to compare the resulting conceptual model with the real world. Step 6 is to create an intervention. Step 7 is action to remedy the situation. Based on the analysis and insights developed from Stages 4-6, it is time to act, make changes to find solutions to problem situations.

3. Research Methods

This research is a case study research which benchmarking the business processes of two universities: College B (accredited C, Sufficient) as a Case Study College, and College A (accredited A, Very Good), as a Benchmarking College. Data were obtained through interviews with leadership elements, that is: deans of faculties, heads of study programs, heads of quality assurance institutions, and heads of research and community service institutions. In addition, observation and document study were conducted to complement the interview data. The study began to identify problems by observing and interviewing leaders who played a role in overcoming IQA problems. Fishbone diagram was used to describe the root cause of each problem domain. The SSM approach combined with benchmarking was used to analyze the conceptual model of IQA [25]. The first stage of SSM, identifies problematic situations by conducting interviews with problematic people, processes and systems, including leaders of the Quality Assurance Institute (QAI), Research and Community Service Institute (RCSI), Study Program (SP), Information and Communication Technology (ICT) in Case Study Colleges and Benchmarking Colleges. The second stage of SSM is a problematic situation statement to produce a rich picture by adopting a two-strand model [26], that is by adding a second strand, that is cultural analysis to strengthen logical analysis in the first strand. The first strand yields best practices, which are generated by a benchmarking analysis approach [25]. The result of the rich picture will show all stakeholders along with their roles and main concerns. The third stage of SSM, formulating the root definition by performing PQR analysis and CATWOE analysis to produce a root definition of the problematic situation which is poured into the deliverable root definition statement. Followed by the fourth stage of building a conceptual model of the root definition results, CATWOE analysis was perfected. The resulting conceptual model is the IQA higher education business process model. The first step is to create a list of IQA activities, mapped by reference to the activity occurrences in a

conceptual model. The next step is to map all system activities to the IQA process, subprocess and mechanism. This mapping produces an IQA business process model according to system activity. The final stage of SSM, comparing the conceptual model with the real word.

4. Results and Discussion

4.1. IQA Business Processes

HEIs are formal education units that provide higher education. The organizing organization is a work unit implementing the 'tridharma' activities and the function of resource management (Figure 2).

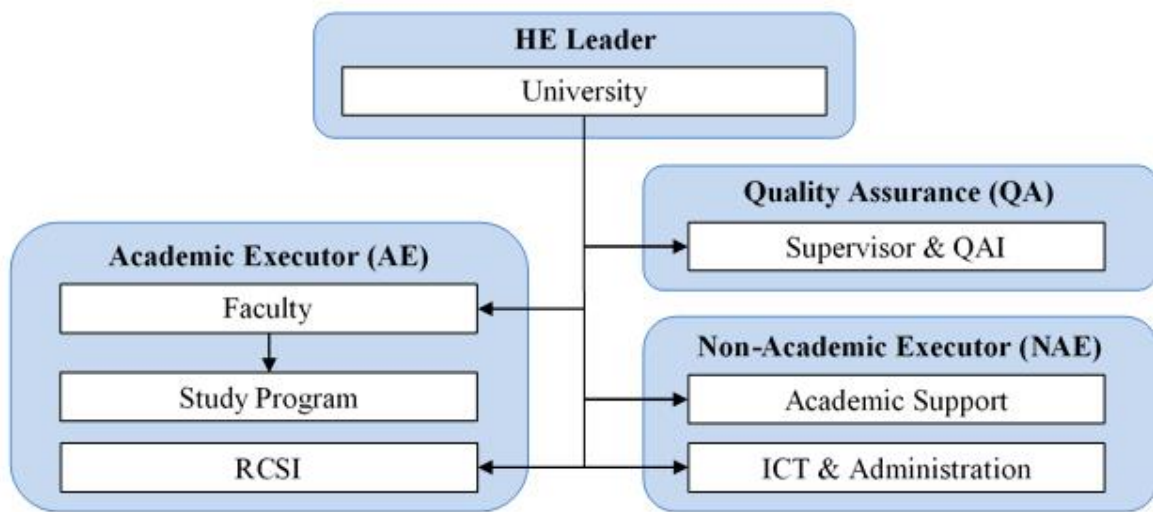


Figure 2: HEIs Work Unit

From observations and interviews at the Case Study College, several problems were found in implementing IQA. These problems are depicted in the fish bone diagram in Figure 3.

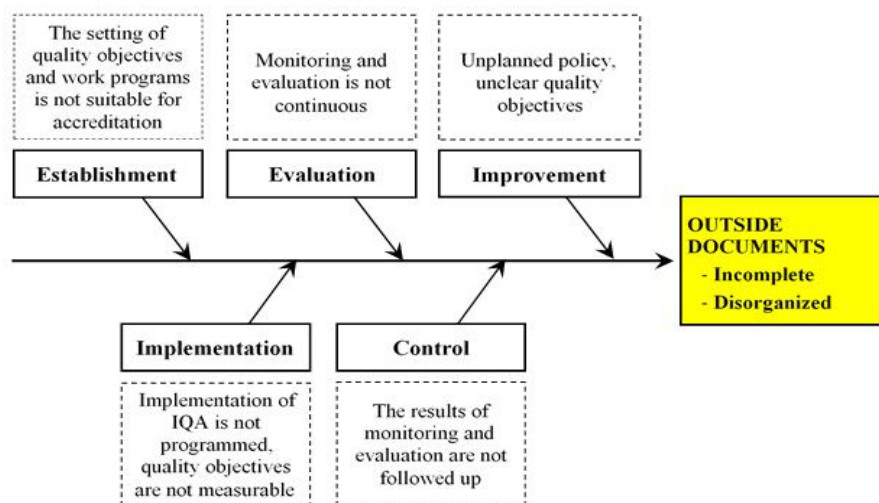


Figure 3: Fish Bone Diagram

From the results of interviews, observations and document studies related to the IQA business process in both colleges (Case Study and Benchmarking), some differences were found, as shown in Table 2.

Table 2: Comparison Results of IQA Business Processes

No	Interview	IQA Business Process	Case Study College	Benchmarking College
1.	QA	Available IQA documents: (Policy, Manual, Standard, Form)	Available < 70%	Available > 95%
2.	QA, AE, NAE	Coordination in self-evaluation and related inventories: – implementation of work programs – achievement of quality objectives	Yes No	Yes Yes
3.	QA, AE, NAE	Coordination in formulating: – work program planning (1 year) – achievement of quality objectives (5 years) – reference for self-evaluation, strategic plan, operational plan – reference to assessment instruments from NAB-HE	Yes No No No	Yes Yes Yes Yes
4.	QA, AE, NAE	Carry out a work program (1 year)	Yes	Yes
5.	QA	Conducting an Internal Quality Audit: – monitoring program implementation – evaluation of program implementation results	Yes, 1 year Yes, 5 year	Yes, 6 month Yes, 1 year
6.	QA	Make recommendations for the implementation of IQA findings and report them to the HE Leader, AE and NAE	Yes	Yes
7.	QA, AE, NAE	Report on recommendations for the implementation of IQA implementation findings is followed up, by: – HE Leader – AE – NAE	No Yes No	Yes Yes Yes
8.	QA, AE, NAE	Documenting the implementation of IQA: – work program planning – work program process – results of work programs	No No Yes	Yes Yes Yes
9.	QA	Control the implementation of IQA to achieve quality objectives	No	Yes
10.	HE, QA	Make improvements: – IQA quality standards – achievement of quality objectives	No No	Yes Yes

4.2. Soft Systems Methodology Analysis

- **Rich Picture**

The formulation of IQA implementation conditions in a rich picture based on the results of interviews and observations that was shown in Figure 4. There are four roles in the IQA business process which are indicated by a blue box. The green box shows the goals the wants to be achieved by the role.

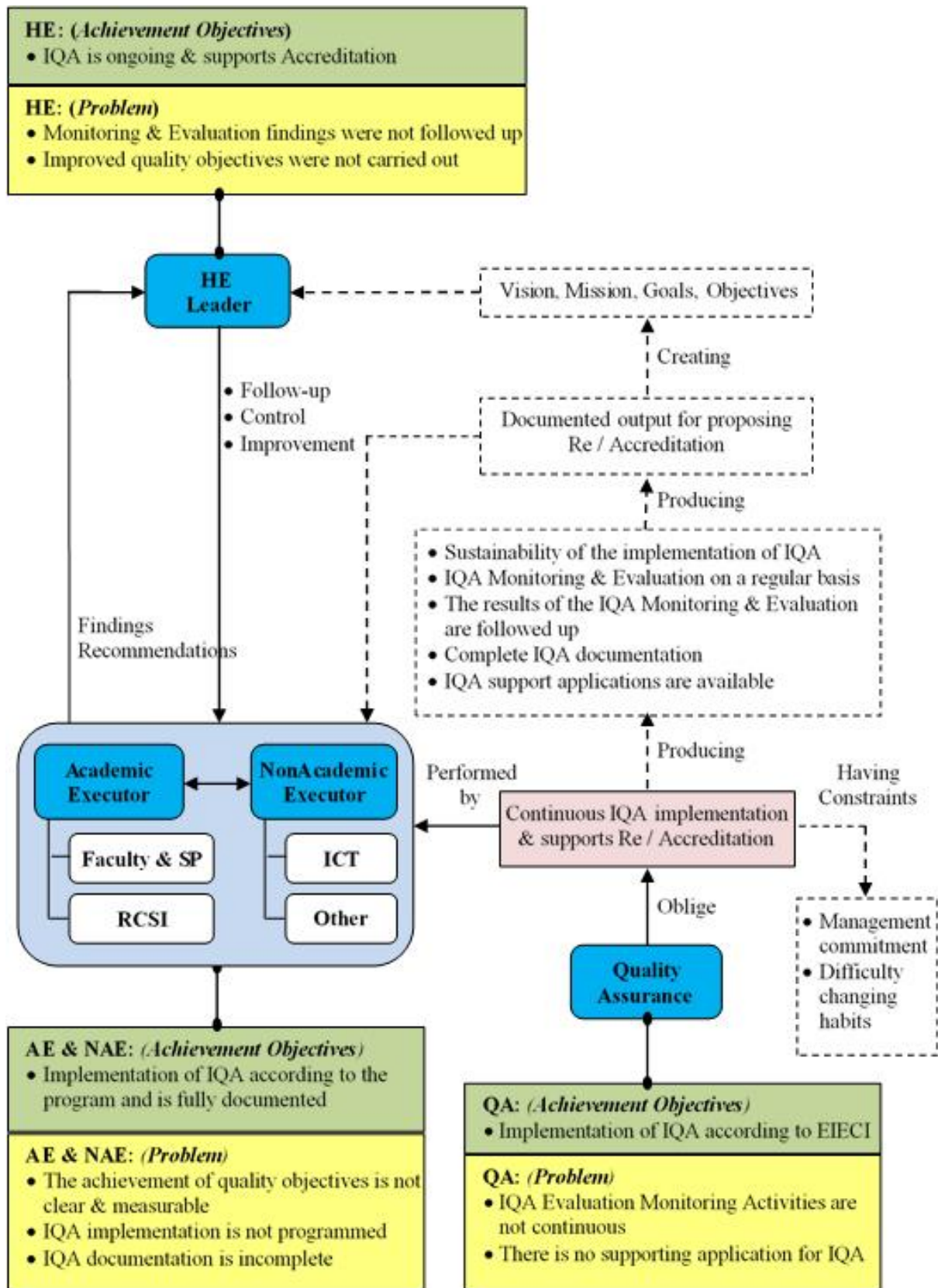


Figure 4: Rich Picture

The yellow box describes the problems experienced by roles related to IQA business processes, while the red

box is a solution related to the problem to be fixed. For example, in the AE and NAE boxes, their goal is to implement IQA according to the program and it must be fully documented. However, because this field does not have clear and measurable quality objectives, the implementation of IQA is not well planned, so that the achievement of quality objectives is not clear and measurable. The results of the IQA implementation document are also incomplete and even non-existent, or scattered and disorganized. Achievement of quality objectives is the result of self-evaluation of current quality objectives, used as the basis for formulating the achievement of the next quality target, and based on the assessment instrument from the National Accreditation Board for Higher Education (NAB-HE).

- **IQA Business Process Conditions**

In the QA box, the objective of this field is the implementation of IQA according to the Establishment, Implementation, Evaluation, Control, Improvement (EIECI). In fact, this field only carries out monitoring and evaluating of IQA when it comes to propose external accreditation. This causes the control of the implementation of IQA to not function properly. The situation is still exacerbated by the absence of computer applications that can support the implementation of IQA in a controlled and transparent manner. In the HE Leader box, the goal to be achieved is a sustainable IQA and supports accreditation. In fact, this section never follows up on the reports of findings from the IQA monitoring and evaluation results. As a result, field findings regarding existing problems and constraints were never discussed and solutions sought. Likewise, in the control and improvement of quality objectives, discussions have never been carried out to formulate the achievement of quality targets that need to be maintained or improved, so that QA, AE and NAE can compile work programs in accordance with the formulation of quality goal achievements.

- **Compilation of Root Definition**

Preparation of root definition uses PQR and CATWOE analysis. PQR analysis is also called XYZ analysis, with the formula: PQR = "A system to do (X) by mean of (Y) in order to (Z)" [26]. Based on the rich picture in Figure 4, the variables in the PQR analysis (Table 3) and CATWOE analysis (Table 4) are obtained.

Table 3: PQR Analysis

Variable	Description	Source
X	Implementing IQA starts from the stage of establishment, implementation, evaluation, control, and improvement, the results of which are well documented	HE Leader, AE, NAE
Y	Using IQA business process support applications	QA
Z	Produce documented output from the results of the implementation of IQA for proposing external Re / Accreditation	QA

Table 4: CATWOE Analysis

Variable	CATWOE Analysis	Source
Customer	QA	QA
Actors	AE, NAE	AE, NAE
Transformation	IQA starts from the stages of establishment, implementation, evaluation, control, and improvement, the results are well documented → IQA business process support applications	QA
Worldview	There is an output document for the implementation of IQA for proposing external Re / Accreditation	AE, NAE
Owners	Higher Education	HE Leader
Environmental Constraints	IQA Budget, Internal Quality Audit Team	QA

PQR and CATWOE analysis are then combined into one formula as follows: "A system owned by O and operated by A, to do X by Y to customers C in order to achieve Z within the constraints E" [27]. Thus, the root definition statement becomes:

‘The IQA business process support application system is owned by Higher Education (O) and is operated by QA and NAE (A) to implement IQA starting from the stages of establishment, implementation, evaluation, control, and improvement, the results are well documented (X) using the application. business process support for IQA (Y) in QA (C) resulting in documented outcomes from the results of the implementation of IQA for proposing external Re / Accreditation (Z) despite some organizational constraints such as a small IQA budget and lack of an Internal Quality Audit Team (E)’.

- **Conceptual Modeling Development**

The conceptual model is compiled using CATWOE analysis, starting with the T (Transformation) and W (Worldview) variables, followed by adding the C (Customer) variable, then the A variable (Actors), then the E (Environmental Constraints) variable and ending by adding O analysis (Owners). The conceptual model development stage is as follows:

1. Model T and W; Transformation and Wordview variables in root definition, as well as the results of interviews with QA, that:

A → QA compiles an IQA document that refers to the Vision, Mission, Goals, Targets of Higher Education and is set by the HE Leaders.

B → QA, AE, NAE conduct self-evaluation and formulate work programs and achievement of HE / SP quality targets for 1 or 5 years, based on the NAB-HE accreditation instrument.

The transformation process aims to implement IQA, so the following activities are proposed:

C → QA, AE, NAE determine and compile taxonomies and permissions for storage folders for planning, processes, outputs from work programs and quality objectives.

D → Implementation of the IQA business process application.

2. Models T, W and C; Customer variable using IQA implementation is QA, and the results of interviews with QA, AE and NAE, it is suggested the following activities:

E → To socialize the importance of IQA.

F → Increase HE Leadership support through reward and punishment.

3. Models T, W, C and A; Actor variable is AE, and NAE acts as a driving force on IQA. The results of the interview with QA then proposed activities:

G → Determine and designate the role of the PIC which is responsible for the work program and the achievement of quality objectives.

H → Documenting planning, processes, outputs from work programs and the achievement of quality objectives.

4. Models T, W, C, A and E; Environment Constraint analysis, based on the results of interview with QA, the following activities are proposed:

I → Strengthening the competence of Internal Quality Audit through training and workshops.

J → Network expansion with other IQA-HE organizations.

5. Models T, W, C, A, E and O; The owner of the IQA application is Higher Education, based on the results of the interview with QA, the following activities are proposed:

K → System integration to all work units in the ICT network.

The results of compiling the conceptual models T, W, C, A, E and O, after being assembled, can be seen in Figure 5 as follows:

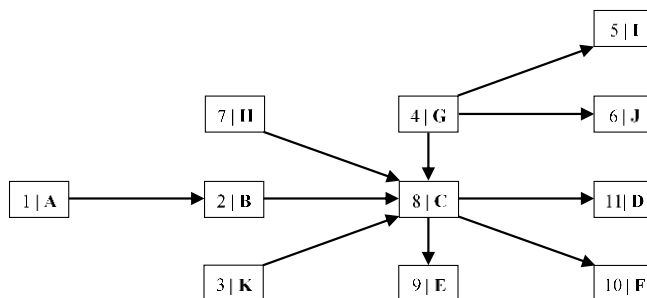


Figure 5: Conceptual Model: T, W, C, A, E and O

• **Comparison of Conceptual Models and the Real World**

The next step, comparing the conceptual model (human activity system) with the real world.

Table 5: Comparison of Conceptual Models and the Real World

No	Activities	Real Conditions	Recommendation
1.	Basic documents for implementing IQA	The basic documents for implementing IQA (Policies, Manuals, Standards, Forms) are incomplete, compiled only in moderation, and are not relevant to actual needs.	QA needs to prepare a complete IQA implementation basic document (Policy, Manual, Standard, Form). In addition, in compiling the IQA document it is necessary to refer to the vision, mission, objectives, targets of HE and needs to be determined by the HE leadership.
2	Self-evaluation, work program plan, determination of achievement of quality objectives	Self-evaluation activities are not carried out continuously, in formulating work programs that are not structured, and it is unclear what measurement of achievement is.	QA, AE, NAE need to carry out self-evaluation continuously (every year), in preparing work programs and the achievement of quality objectives it is necessary to formulate a structured 1-5 years in accordance with the strategic plan, operational plan, and refer to the NAB-HE accreditation instrument.
3.	System integration	Divisions / work units have utilized SI but are not yet integrated, often problems with reporting, calculations, and availability of documentary evidence of activities when needed.	System integration from all divisions / work units to the ICT work unit network needs to be carried out, so that management, supervision and documentation of activities can be well organized.
4.	PIC / person in charge	Between divisions / work units there is often a shifting of responsibility because there is no clarity on who should be responsible.	Determine and designate the role of the PIC which is responsible for the work program and the achievement of quality objectives
5.	Strengthening Internal Quality Audit	Human resources who carry out internal quality audits are limited, lack experience and have an impact on the quality of audit results.	It is necessary to strengthen the competence of Internal Quality Audit to the human resources who will be appointed as the Internal Quality Audit team through training and workshops.
6.	Comparative study	Divisions / work units and human resources are still weak in managing the implementation of IQA.	It is necessary to provide an opportunity for the division / work unit to expand the network with other IQA-HE organizations, with comparative studies and other collaborations.
7.	Documentation of plans, processes, results	Divisions / work units often ignore documentation at the planning and process stages, only focusing on documenting the results.	It is necessary to carry out comprehensive documentation starting from the planning stage, the process, the results of the work program and the achievement of quality objectives, both successful and unsuccessful.
8.	Document storage folder	The document storage area is still in hardcopy and is stored in each division / work unit.	QA, AE, NAE compile hardcopy storage folders for planning, implementation, outputs of work programs and achievement of quality objectives, ICT work units keep softcopies.
9.	IQA socialization	Understanding of IQA is still limited to certain leaders or human resources	It is necessary to socialize the importance of IQA to the entire academic community and make a culture that must be agreed upon.
10.	Reward and punishment	HE leaders have not given awards / sanctions to the academic community regarding IQA	HE leadership gave rewards and punishments to increase support for the work unit / unit and its human resources.
11.	Implementation of the IQA application	The implementation of IQA has not been implemented in all parts / work units	IQA implementation needs to be implemented in all parts / work units and existing human resources.

The comparison results in the form of recommendations: what should be maintained, improved, made new. The resulting recommendations cover eleven points, shown in Table 5.

- **Change Planning**

The main objective of IQA is to control and improve the implementation of higher education in a planned and sustainable manner. This is done through five main steps, that is the establishment, implementation, evaluation, control and improvement of Higher Education Standards. From the results of the comparison of conceptual models and the real world above, the proposed change planning includes the following eleven activities:

- Prepare internal quality assurance regulatory documents;
- Self-evaluation, planning work programs and determining the achievement of quality objectives;
- Integrating information systems;
- Assigning a coordinator as the person in charge;
- Strengthening the internal quality audit team;
- Conduct a comparative study;
- Documenting the planning, implementation and results of internal quality assurance;
- Prepare document storage space;
- Internal quality assurance socialization;
- Give rewards and punishments;
- Implementation of the internal quality assurance application.

- **Actions for Correction**

It is at this stage that the methodology has reached a complete cycle and it is possible that it is the beginning of a new cycle. Based on the analysis and discussion group forums at universities A and B, the model developed from stages 4–6, now is the time to act on implementing the eleven recommendations for improvement proposed in the previous step, creating changes to find solutions to problem situations.

IQA Improvement Recommendations

- Making basic documents for the implementation of IQA completely and referring to the vision, mission, objectives, and goals of the institution;
- The work unit in HE conducts continuous self-evaluation and compiles a structured work program and achievement of quality objectives for 1-5 years according to the strategic and operational plan, with reference to the NAB-HE accreditation instrument;
- Integrate information systems from all work units so that the management, supervision and documentation of IQA activities can be well organized;
- Appoint Person in Charge (PIC) who is responsible for planning, implementating, and output stages of work programs and the achievement of quality objectives;
- Strengthening the competence of the Internal Quality Audit team through training and workshop;

- Provide opportunities for work units to expand networks with other IQA-HE organizations, with comparative studies and other collaborations;
- Carry out comprehensive documentation starts from the planning stage, implementation, and the results of the work program and the achievement of quality objectives, which are successful and unsuccessful;
- Requesting the work unit to determine the storage folder for planning, implementing, and output of the work program and the achievement of quality objectives in the form of hardcopy, while the ICT work unit keeps in the form of softcopy and dissertation of information on hardcopy storage location;
- Promote IQA to the entire academic community and create a culture that must be agreed upon;
- Increasing support from HE leadership to work units and human resources who are directly involved in the implementation of IQA through reward and punishment;
- Implementing IQA in all work units and supported by existing human resources.

5. Conclusion

This research has provided a holistic and comprehensive approach to the implementation of IQA in controlling and improving the implementation of higher education in a planned and sustainable manner, through the establishment, implementation, evaluation, control and improvement of Higher Education Standards. Different from previous studies which attempted to find the factors causing the lack of success in implementing IQA, this study provides a conceptual model of internal quality assurance and recommendations for correcting undesirable situations. From the results of the discussion that has been carried out above, it can be concluded that several important things that must receive attention in the application of the internal quality assurance system in higher education include:

- SSM method can be used by universities for comprehensive evaluation and improvement of the university's internal quality assurance system.
- The results of this study are in the form of a conceptual model of internal quality assurance and some recommendations for improvement of the existing system.
- Implementing recommendations such as those proposed above requires a PIC who is responsible for managing the entire IQA process.

The limitation of this research is the limited data sample so that further research can be expanded to higher education institutions regionally and nationally and provide a larger portion related to the non-technical design of internal quality assurance, namely the standard procedures and rules of the organization regarding the implementation of internal quality assurance.

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6. Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- [1]. Ł. Sułkowski. (2016, Mar). "Accountability of University: Transition of Public Higher Education". *Entrepreneurial Business and Economics Review*. [On-line]. 4(1), pp. 9-21. Available: <https://doi.org/10.15678/EBER.2016.040102>. [Dec. 5, 2019].
- [2]. D.J. Deming and D. Figlio. (2016, Summer). "Accountability in US Education: Applying Lessons from K-12 Experience to Higher Education". *Journal of Economic Perspectives*. [On-line]. 30(3), pp. 33-56. Available: <https://doi.org/10.1257/jep.30.3.33>. [Feb 10, 2020].
- [3]. Hazelkorn E. (2018, Jul). "The Accountability and Transparency Agenda: Emerging Issues in the Global Era. In: Curaj A., Deca L., Pricopie R. (eds) *European Higher Education Area: The Impact of Past and Future Policies*. [On-line]. Springer, Cham. Available: https://link.springer.com/chapter/10.1007/978-3-319-77407-7_26. [Jan 5, 2020].
- [4]. Vella M. (2017). *Internal Quality Assurance: Step by Step Guide to Internal Quality Assurance*. National Commission for Further and Higher Education. [On-line]. Erasmus+. Available: <https://ncfhe.gov.mt/en/resources/Documents/Publications/Quality%20Assurance/Step%20by%20step%20guide%20to%20internal%20quality%20assurance.pdf>. [Feb 10, 2020].
- [5]. L. Nabaho, W. Turyasingura, A.K. Kiiza, F. Andama and A. Beinebyabo. (2020, Sep). "Quality assurance of higher education governance and management: An exploration of the minimum imperative for the Envisioned African Common Higher Education Space". *Higher Learning Research Communications*. [On-line]. 10(2), pp. 38-52. Available: <https://doi.org/10.18870/hlrc.v10i2.1183>. [Feb 14, 2021].
- [6]. T.S. Chaparro, V.G. Frías and O.G. Benito. (2019, Dec). "Competitive Implications of Quality Assurance Processes in Higher Education. The Case of Higher Education in Engineering in France". *Economic Research-Ekonomska Istraživanja*. [On-line]. 33(1), pp. 2825-2843. Available: <https://doi.org/10.1080/1331677X.2019.1697329>. [Mar 17, 2020].
- [7]. Law No. 20 (2003). *National Education System*. [On-line]. Available: on https://www.ilo.org/dyn/natlex/natlex4.detail?p_isn=84435&p_lang=en. [Feb 10, 2020].
- [8]. H. Prabowo, G. Farida and D. Vidayanti. (2017). "Implementing the Quality Assurance System in Indonesian Higher Education". *Actual Problems of Economics*. [On-line]. 11(197). Available: <https://doi.org/10.13140/RG.2.2.21424.92165>. [Feb 11, 2020].
- [9]. P.I.D. Kemenristekdikti. (2018). *Higher Education Statistical Year Book 2018*. [On-line]. Higher Education Database, Jakarta. Available: <https://pddikti.kemdikbud.go.id/asset/data/publikasi/Statistik%20Pendidikan%20Tinggi%20Indonesia%202018.pdf>. [Jun 13, 2020].
- [10]. A. Mursidi, T.J. Raharjo, Sugiyo and A. Yulianto. (2020). "Factual Model of Internal Quality Assurance System of Private Higher Education Institutions in Indonesia". *Journal of Education*,

- Teaching, and Learning. [On-line]. 5(1), pp. 46-52. Available: <https://doi.org/10.26737/jetl.v5i1.1926>. [Jan 19, 2021].
- [11]. A. Noda, S. Kim, A.Y.C. Hou, I-J.G. Lu and H.C. Chou. (2021) "The relationships between internal quality assurance and learning outcome assessments: challenges confronting universities in Japan and Taiwan". *Quality in Higher Education*. [On-line]. 27(1), pp. 59-76. Available: <https://doi.org/10.1080/13538322.2020.1838406>. [May 26, 2021].
- [12]. D. Vykydal, M. Folta, J. Nenadál. (2020). "A Study of Quality Assessment in Higher Education within the Context of Sustainable Development: A Case Study from Czech Republic". *Sustainability*. [On-line]. 12(11). Available: <https://doi.org/10.3390/su12114769>. [Jan 19, 2021].
- [13]. T.M.H. Le, V.K.L. Nguyen, T.S. Nguyen, T.H.O. Le and T.N.M. Duong. (2021). "Assessment of Students' Satisfaction of Facility Service Quality in Private Universities". *Universal Journal of Educational Research*. [On-line]. 9(5), pp. 974-983. Available: <https://doi.org/10.13189/ujer.2021.090510>. [May 26, 2021].
- [14]. S. Andleeb and A. Jusoh. (2020). "Institutional Internal Quality Assurance Assessment Practices and Student Satisfaction". *Journal of Public Value and Administrative Insight*. [On-line]. 3(3), pp. 117-144. Available: <https://doi.org/10.31580/JPVAI.v3i3.1647>. [May 26, 2021].
- [15]. N. Rahnema. (2020). The Bangladeshi higher education quality assurance framework: a pathway for transformation. *Quality in Higher Education*. [On-line]. 26(1), pp. 14-31. Available: <https://doi.org/10.1080/13538322.2020.1729309>. [Jan 19, 2021].
- [16]. H. Lucander and C. Christersson. (2020). "Engagement for quality development in higher education: a process for quality assurance of assessment". *Quality in Higher Education*. [On-line]. 26(2), pp. 135-155. Available: <https://doi.org/10.1080/13538322.2020.1761008>. [May 26, 2021].
- [17]. M. Seyfried and P. Pohlenz. (2018). "Assessing quality assurance in higher education: quality managers' perceptions of effectiveness". *Quality in Higher Education*. [On-line]. 8(3), pp. 258-271. Available: <https://doi.org/10.1080/21568235.2018.1474777>. [May 26, 2021].
- [18]. O.A. Khurma, Y.A. Ramamneh, T. Hassell, M.A. Hammadi, S. Zoelfakar and Y. Fairouz. (2020). "Quality Assurance Model in Enhancing the Professional Development Content". *International Journal of Sciences: Basic and Applied Research*. [On-Line]. 54(5), pp. 49-68. Available: <https://www.gssrr.org/index.php/JournalOfBasicAndApplied/article/view/12020>. [May 26, 2021].
- [19]. Elviwani, M. Zarlis, A. Dilham and R. Buaton. (2020). "Higher Education Quality Assurance System Based Artificial Intelligence". *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*. [On-line]. 6(6), pp. 274-279. Available: <https://doi.org/10.32628/CSEIT206635>. [May 26, 2021].
- [20]. M.J. Manatos and J. Huisman. (2020). "The use of the European Standards and Guidelines by national accreditation agencies and local review panels". *Journal Quality in Higher Education*. [On-line] 26(1). Available: <https://doi.org/10.1080/13538322.2020.1728835>. [Jan 19, 2021].
- [21]. K.P.J. Lilja. (2017). "Key enabling factors for organizational ambidexterity in the public sector". *International Journal of Quality and Service Sciences*. [On-line]. 9(1). Available: <https://doi.org/10.1108/IJQSS-04-2016-0038>. [Apr 21, 2022].
- [22]. A. Kashyap, R. Agrawal and P.K. Ghosh. (2018). "Examining higher educational institutes for better

- growth of national economy through structured innovation”. *Int. J. Innovation in Education*. [On-line]. 5(1), pp. 61-78. Available: <https://doi.org/10.1504/IJIE.2018.093819>. [Jan 16, 2020].
- [23]. A. Prowse, V.R. Vargas and S. Powell. (2020). “Design Considerations for Personalised Supported Learning: Implications for Higher Education”. *Journal of Further and Higher Education*. [On-line]. 45(1), pp. 497-510. Available: <https://doi.org/10.1080/0309877X.2020.1789915>. [Jan 19, 2021].
- [24]. D. Heathcote, S. Savage and A. Hosseinian-Far. (2020). “Factors Affecting University Choice Behaviour in the UK Higher Education”. *Education Sciences*. [On-line]. 10(8), pp. 199. Available: https://doi.org/10.1007/978-3-319-77407-7_26. [Jan 19, 2021].
- [25]. B.L.M. Morrell, H.N. Eukel and L.E. Santurri. (2020). “Soft skills and implications for future professional practice: Qualitative findings of a nursing education escape room”. *Nurse Education Today*. [On-line]. 93. Available: <https://doi.org/10.1016/j.nedt.2020.104462>. [Jan 19, 2021].
- [26]. H. Bernardo, A. Gaspar and C.H. Antune. (2018). “A Combined Value Focused Thinking-Soft Systems Methodology Approach to Structure Decision Support for Energy Performance Assessment of School Buildings”. *Sustainability*. [On-line]. 10(7), pp. 2295. Available: <https://doi.org/10.3390/su10072295>. [Jan 19, 2020].
- [27]. R. Sharma, C. Zhang, S.C. Wingreen, N. Kshetri and A. Zahid. (2019). “Design of Blockchain-based Precision Health-Care Using Soft Systems Methodology”. *Industrial Management & Data Systems*. [On-line]. 120(3), pp. 608-632. Available: <https://doi.org/10.1108/IMDS-07-2019-0401>. [Jun 9, 2020].
- [28]. N. Nurhasanah, Machfud, D. Mangunwidjaja and M. Romli. (2020). “The Application of Soft System Methodology to Design the Conceptual Model for Intelligent Supply Chain Model of Natural Fibre Agroindustry”. *IOP Conference Series: Materials Science and Engineering*. [On-line]. 847(1). Available: <https://doi.org/10.1088/1757-899x/847/1/012089>. [Jan 19, 2021].
- [29]. P.B. Checkland and J. Scholes. (1990). *Soft Systems Methodology in Action*. [On-line]. John Wiley and Sons, Inc., New York. Available: <http://dl.acm.org/citation.cfm?id=130360> [Jul 22, 2019].
- [30]. B. William. (2005). *Soft System Methodology*. [On-line]. The Kellogg Foundation. Available: <http://www.bobwilliams.co.nz/ewExternalFiles/ssm.pdf>. [Jul 22, 2019].