

USING SOFT SYSTEMS METHODOLOGY AS AN APPROACH TO EVALUATE CHEATING IN THE NATIONAL EXAMINATION

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ABSTRACT

One of the most important issues the National Examination (UN) is the quality aspect of the level of honesty or integrity of parties involved in national examination. From various evaluation of the National Examination, the acts of cheating is always a problem from year to year, starting from the incident of cheating until the leakage of exam questions has always been a polemic. One of the factors considered to be the largest contributor to the cheating behavior is the national exam as a determinant of students' graduation. For that matter, the government has implemented various policies including removing the national exam as determinant of graduation, but the policy was not followed by a decrease in the rate of cheating. This research is using soft-system methodology as well as to propose a conceptual model and plan for change in facing in situation of the problems.

Keywords: *National Examination, Cheating, Soft-System Methodology*

1. BACKGROUNDS

National Examination (UN) in Indonesia is a huge and important project with a very large budget. UN is held by central government and applies to Junior High school (SMP) and Senior High School (SMA) levels or equivalent education unit. UN divided by two types of exam: computer-based national exam and national exam with papers and pencils for the school that do not have an online computer device. For example, in 2017 the number of Senior High School participants who take part in national exam is 1.8 million students; 63.6% of them followed computer-based national exam and the rest took paper and pencil-based exam.

There are 20.553 schools that take National Examination. Out of this number 47.01% were able to organize computer-based UN and 52.99% have to organize paper and pencil-based UN [1].

UN has an important role for many parties in Indonesia. Students expect to pass national exam in order to continue their education to a higher level; parents want their children to graduate with a high average score to be admitted to a state school or university; teachers and schools are under intense pressure to achieve 100% percentage of graduation in order to keep school's good reputation in the

community are not declining; local governments are particularly concerned about their graduation rates as it is related to the community appraisals on the performance of their government in education; and central government is very attentive to the national exam as an effort to improve the quality standard of education in Indonesia.

However, all efforts to improve the levels of graduation rates and quality are still overshadowed by the low level of honesty in the implementation of National Examination. Various policies of central government are conducted to suppress the cheating rates in national exam such as reduce the percentage of the UN in determining the graduation, replace UN with national standard-based school exams, gradually replace paper and pencil-based exam with computer-based exam, but all these policies have not been able to eliminate the deception that occurred in the national exam. Besides, the previous research regarding implementation of the UN gave more negative sentiment than positive sentiment in society [2].

The research aimed to describe the implementation of Soft-system Methodology (SSM) in understanding why the cheating in the National Exam in Indonesia continuously occurred even though various policies have been done by the government.

2. LITERATURE REVIEW

Previously various studies have attempted to peel the low level of honesty in the implementation of the UN. According to Rasyid Nur [3], cheating in UN is already entrenched. UN participants do various ways to pass the UN. Even teachers and principals often involved in leaking of UN answer-key. The same is stated by Taufiqqurahman [4] that there are still fraudulent practices in the implementation of the UN. Whereas the main purpose of implementation of the UN is to improve quality standard of national education through the UN that is accountable and objective.

Cheating behavior in doing the UN is considered as a behavior that decreases students' academic integrity. Therefore to monitor and reduce the level of cheating in implementation of the UN, the government issued what is called IIUN (National Examination Integrity). IIUN started since the introduction of computer-based UN or it called UNBK or Computer Based Test (CBT) in 2015.

With IIUN, the UN is not only to measure the achievement of students' academic ability but also to measure the level of honesty of the UN doers. School as UN organizer will get the value of IIUN which shows the level of honesty in implementing the UN.

This fraudulent condition requires a clearer understanding of the role of stakeholders involved in the implementation of the UN. Cheating behaviors which both occurred in the written exam and computer-based exam are under the Theory of Planned Behavior of Ajzen. According to Ajzen [5], certain behavior is controlled by three main aspects: first is the individual's attitude to engage in certain behavior; second, the subjective norms namely the perception of social pressure to engage or not engage in such behavior; and third, individual control over the condition of behavior and its consequences. [5]; [6]). This means efforts to reduce the level of cheating in the UN involving all stakeholders involved.

Some previous studies have shown that no one has comprehensively examined the SSM-based National exam problems. Research on existed cheating in the UN has been more emphasis on search and test of factors that influence the cheating behavior of the students, correlation between academic anxiety and academic integrity, cheating behaviors and attitudes of students, teacher and student perceptions, reducing cheating opportunities, correlation between self-efficacy and cheating behavior, academic and the relationship

between academic performance and cheating [7]; [8]; [9]; [10]; [11]; [12]; [13]; [14]), that are less comprehensive.

Besides, the complexity of UN in terms of involvement of many parties from central government levels to school levels led to disagreements among many experts to variables that affect the occurrence of such cheating. Different from previous research, this research using SSM to give a clear understanding of the various aspects involved in the cheating. SSM is a system approach for application in social organization where the situation is unstructured and there is no concession among stakeholders. SSM accommodates the different perspective through the improvement of the model of system conceptual of human activity. Then, this model is used to decide the intervention for resolution or improvement of situation [15]. Therefore, SSM is suited as a framework of modeling, improving pragmatic action, seeking compromise, and shared learning in the development of organization or school community

3. RESEARCH METHODS

To decrypt the cheating situation occurring in the UN conducted using SSM developed by Checkland dan Scholes [16]. The core of this method is to provide comparison between the real world with a model that is thought to represent the world itself. Conceptual model developed can be used as brainstorming media in overcoming the faced problem situation [17]; [18].

SSM has ability to produce framework to understand the problems faced, even for the complex problems. SSM application has already widely applied in various countries by experts and researchers of various disciplines, for example in the field of: evaluation of policies [19], sugar industry [20], value co-creation [21], health [22], empowering dairy business [23], safety performance evaluation [15]; sustainable development [24], computer game design [25], or military [26]

SSM Methods have seven (7) stages. The seven stages are summarized briefly in Figure 1 below:

(1) Examines unstructured problems.

In this stage, information collecting is needed in relation with school development strategy, including some views of the parties involved. Information collecting is done through various news in online media. News in online

media contained much information collected by journalist through the opinions of stakeholders who related to schools such as students, parents, teachers, principals, central and regional level officials, academic experts or examiners

(2) Express the problem situation.

Information gained in the first stage then be expressed in the form of *rich picture* or also called representation of current situation. Rich picture is unstructured figure that communicate all things that thought about the situation being analyzed

(3) Build the definition that related to the problem situation.

Important part of this stage is to formulate *root definition*, is brief sentence to state “a system to do P in the manner of Q to reach R”. Furthermore, *Root definition* stated in the CATWOE model as shown in the Table 1.

(4) Build conceptual model

Based on *root definition* above for each element defined, then build the conceptual model that needed to achieve the ideal goals. This model identifies human activity system results from expression of problem situation in *rich picture* and presenting the relations between the activities. This conceptual model is adaptive process as there is feedback between the modeling process with the result of expression of problem situation. All elements in CATWOE are included in conceptual model.

Table 1 Elements and Description of CATWOE

Element of CATWOE	Description
Costumer	Who gets the benefits of the goal activity?
Actor	Who implements the activities?
Transformation	What should be changed so that input becomes output?
World-view	What kind point of view that makes the system meaningful?
Owner	Who can stop the activities?
Environment	What barriers existed within the system environment?

Adopted from [16].

(5) Compare the conceptual model with problem situation

This stage is aimed to compare the conceptual model developed in stage 4 with problem situation expressed in stage 2. In this stage each party involved could give perception and assessment to the modeled activities to determine what should be maintained and reviewed.

(6) Set appropriate and desirable changes

The aim of this stage is to identify and set the desirable changes systemically and reasonably. Changes can occur in the structure, procedure or people’s attitude. Modified model will be a recommendation model of intervention strategy to improve the situation.

(7) Actions to improve the problem situation.

In this stage, school development strategy is implemented in real actions to produce a desirable change.

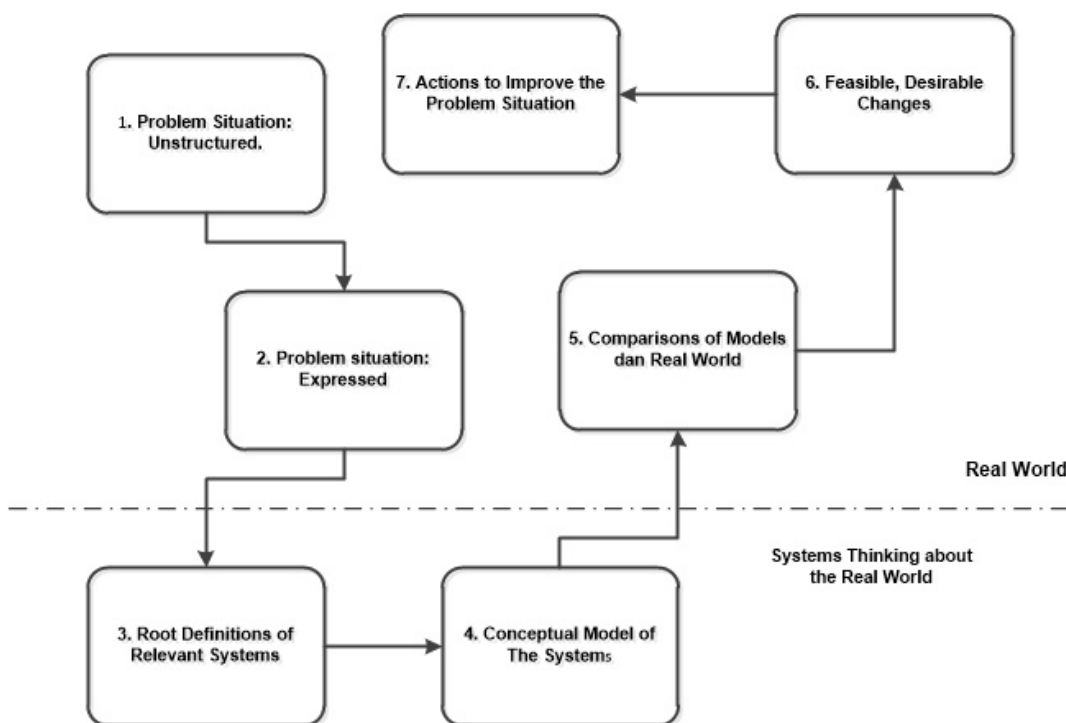


Figure 1. The stages of Soft System Methodology

4. RESULTS AND DISCUSSION

Based on the seven stages of SSM, followings are explanation of results and discussion obtained from each of stages studied:

4.1. Study Of Unstructured Problems

One of the most important issues in national exam is quality aspect of the honesty level or integrity of parties involved in national exam. From various evaluations of the national exam, acts of cheating has always been a problem from year to year, started from incident of cheating to leakage of exam questions always been a polemic.

Several problems in quality aspect of national exam which were obtained from this research are as follows:

1. Exams that have a high risk of passing or not passing encourage many parties to cheat. The implementation of UN that clean, honest responsible, accountable and objective becomes difficult because all education stakeholders are comparatively involved in cheating. Consequently, cheating in the UN is systematic and entrenched.
2. The government policy by determining the passing standard and the same exam

questions for schools throughout Indonesia, without being balanced by the same equipment and infrastructures will obviously foster opportunities in achieving the goal of improving the quality of education.

3. Perception in the society, parents and students that success is identical with high academic value including UN value.
4. The fear of graduation is not only experienced by students, the school is even more afraid of the graduation rates of students. The graduation rates of students are very influential on the prestige of the institutions. The more students who do not pass the UN, the image of the institutions will go down, so that it affects the number of new students who enroll into the school. The Education Services is also demanding the schools for all of its students pass 100%. If some do not pass the exam, education services is considered failed.
5. Index of integrity as determinant of honesty can no longer be fully held because of the known patterns and keys.

The problem of honesty in national exam becomes very important as the Law of National Education System UU SISDIKNAS No. 20 year of 2003, Article 1 mandated that education is a conscious and planned effort to create an

atmosphere of learning and learning-process so that learners actively develop their potential to have spiritual power, self-control, personality, intelligence and noble character. The development of student potential is also emphasized in article 3, besides has noble character, also knowledgeable, skillful, creative, independent and become citizen of democratic and also responsible. Based on the mandate of

the Law, there is no place for education stakeholder to tolerate a cheating.

4.2. Express The Problems

To show the cheating situation in UN, a rich picture is displayed with various perspectives that emphasize the structure, process, relationships, conflict and values that are believed by stakeholders. (Figure 2).

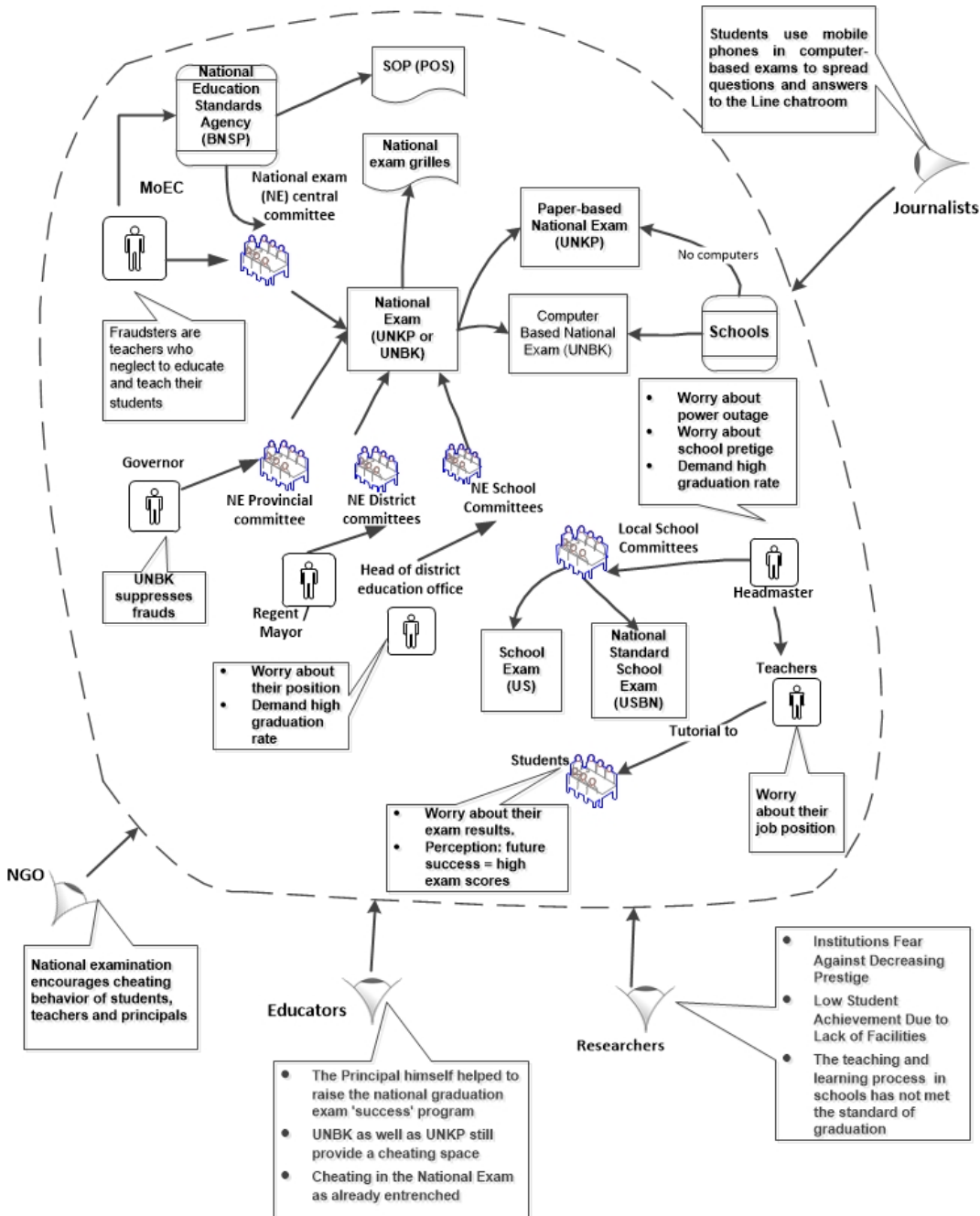


Figure 2. Rich picture

Based on the above rich picture, can be understood the map of problems surrounding cheating problems in UN, started from community perception, anxiety over the final outcome of the UN, threats to prestige and positions, to the school facilities, electricity and internet.

If various factors contributed to cheating in the UN are not handled properly, then the cheating in the national exam will continue to occur. This is the concern of various circles because in order to get high graduation rates

many parties involved are willing to commit various acts of cheating even this situation increasingly entrenched and systematic. [27]; [28]; [29]; [30]; [31]

4.3. Root Definition

To formulate root definition and describe how the system model of national exam that clean, honest and objective, then use the analysis model of CATWOE (Table 2).

Table 2. CATWOE Analysis

Description	Definition results
Costumer (C): person influenced by system - Students - Parents	What are the benefits and the disadvantages and why are these important? - Student : who study at school and participate in UN - Parents: who want their children graduate the UN with high score
Actor: person with the role of system in activities - Teachers - Principals - Local government - Central government	Who implement the activities? - Teachers: who do teaching and learning process. - Principals: who make policies for school and teachers - Local government: who make education policies in their local region and provide education facilities such as computer and internet. - Central government: who determine the policies of National Exam
Transformation: process and changes	What should be changed so that input becomes output? - Establishment of a system model of UN with low rates of cheating and without anxiety on teachers, school and the head of education services due to low pass rates
World-view: Impact of system implementation	What kind point of view that makes the system meaningful? - All stakeholders involved have responsibility to succeed the UN which is clean, honest and objective
Owner: to whom the system responsible and who can stop the transformation	Who can stop the activities? - Parents do not instill good moral ethics to children - Teachers do not give a good discipline to students in teaching and learning process (PBM) - Principals do not give sanctions to students and teachers who do not. - Local government contributed to cheating and do not give sanction to teachers and principals. - Central government: who can change the system and policies of UN
Environment: environmental constraints that affect but do not control the system	What barriers existed within the system environment? - Society thought graduation and high score of UN is identical with future success. - Agencies that still recruit graduates based on the average value of UN - Limitation of budget to improve the school facilities to be able to support the improvement of education quality and achievement of national exam standard.

4.4. Conceptual Model

By referring to *root definition*, conceptual model is compiled to identify the activities needed in the development of the system that can improve the clean, honest and objective UN. Conceptual Model shows the relation of the

activity of doers and processes in the system (Figure 3).

The explanation of this conceptual model can be explained as follows:

1. UNKP which has been considered to give the biggest contribution to cheating on the UN, need to be gradually converted into UNBK. But for it, both government and school need to provide budget to improve the computer facility and internet of the school, including electric power.
2. Government and school should also allocate budgets for training to improve the teachers' quality in learning-teaching process (PBM). The teacher training is also gives teachers ability to undertake process-based assessments rather than merely based on its final outcomes.
3. All parties; parents, teachers and schools need to instill discipline and self-confidence of the students that person's success does not necessarily depend on the final results of the UN. This is expected to reduce the desires of students to pursue high UN score through cheating.
4. The determination of students' graduation through schools is expected to reduce the concerns of many parties. But there is still a practice that UN score is used by several universities, especially state universities, as one of the factors to recruit new students. .
5. The use of UN as mapping tools of school's quality cannot be left alone but need accompanied by accreditation of the school concerned.

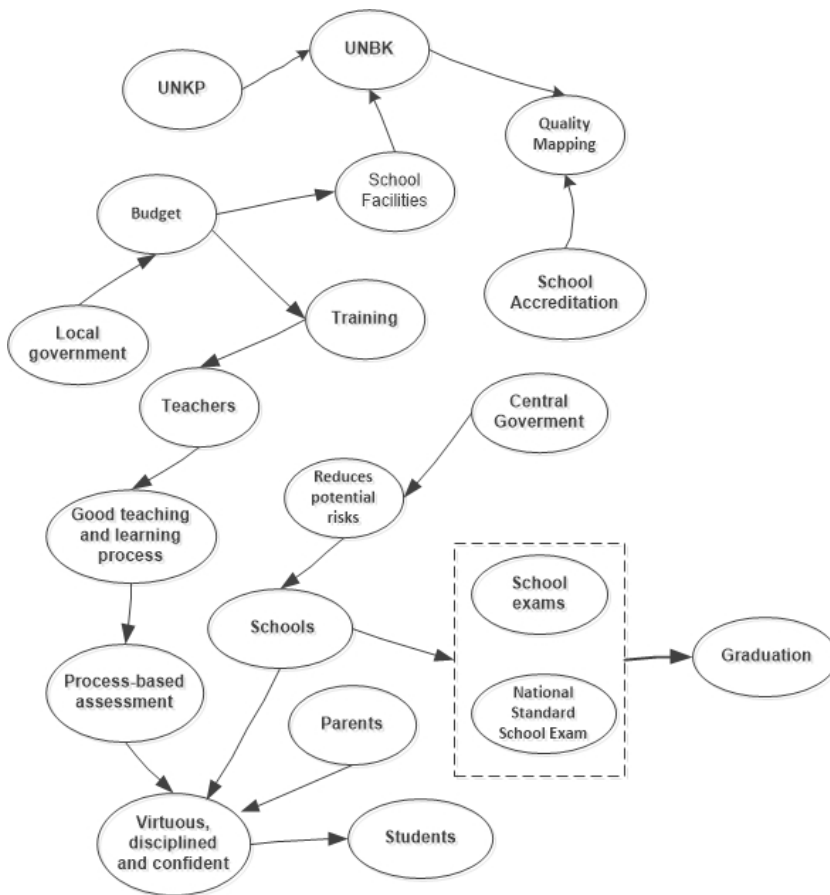


Figure 3 Conceptual Model

4.5. Comparison of Models and The Real World

Once the conceptual model is obtained, the next step is to compare conceptual model (*human activity system*) with real world which

resulted in recommendation of what to maintain, to improve or to create a new one. Recommendation delivered in the process covers six points that shown in details on the Table 3 below:

Table 3: Comparison of the results of conceptual models and the situation of real world.

Activities	Real Condition	Recommendation
UNKP becomes UNBK	UNBK has not been widely used by many schools that follow UN. This is due to the limitation of computer, internet, electricity & its infrastructures. UNKP is considered to be many causes of cheating in national exam	Gradually schools will complete infrastructures for their UNBK. In addition to schools, local government are also requested to provide the infrastructure budget for UNBK in their regions.
Training for teachers to improve their ability in conducting teaching and learning process (PBM)	Many teachers do not have the ability to organize a good PBM, especially in using the manual books provided by the government.	Local government is encouraged to provide various training for teachers in their region to improve teachers' ability to achieve the required standard.
Process-Based Assessment	Assessment in many schools are still based on paradigm of final achievement, so it needs to be changed to paradigm of process where good result will only achieved from good process. The final value is not the focus of evaluation, but the process or way of achievement.	The Head of local Education Services need to ask the schools under to change the way the teachers evaluate their students.
Guidance of character, self-confidence and discipline of students	There are perceptions in students that success is identical with high value. This is encouraging students to cheat every test or exam.	Both schools and parents need to build good character, self-confidence and discipline of the students. Teachers could invite experts from outside of school to give the insights to students regarding the importance of good self-integrity..
Determination of graduation by schools	Even though the national exam is said not to be determinant of graduation but the government requires an average score of all UN lessons at least 5.5. Exam questions are often more difficult than school exam. Student cannot meet the minimum standards to be able to choose or not to choose to take a repair-exam. The value of UN is submitted to the universities that recruit prospective students.	Should the value of national exam only become government consumption and not submitted to universities as a consideration of recruitment of prospective students.
Quality Mapping	Currently, National exam is not a requirement for students' graduation and is used as an effort of central government to map the quality of education in various schools and regions.	Questions in national exam should be able to measure the levels of student mastery for each taught materials. The efforts of school quality mapping should be followed by school accreditation and improvement of schools' education facilities.

4.6. Planning Of Change

The main purpose of the UN is to equate the quality standard of graduation for all students in Indonesia, both existing in every school and every region. The government wishes that the quality of graduates have the same standards throughout Indonesia as a national standard. But this cannot be achieved as the very diverse condition of schools and regions. This diversity has caused concerns on the number of parties involved in the national exam, such as students, teachers, principals and the head of local education services. As long as the government has not be able to improve school facilities that support the desired educational standard, then there is no rationale for government to equalize the same standard of graduation throughout Indonesia. The best alternative is to eliminate the requirements of the national exam as a determinant of graduation. The National exam is then only used to mapping the school quality standard across Indonesia together with school accreditation.

However, the abolition of the national exam as a graduation requirement does not directly affect the reduction of cheating occurred within the national exam. Therefore, any policy towards national exam should also be followed by other policies that address the root of the cheating problem itself.

From the analysis above, planning of change proposed are as follows:

- a) Change of national exam status by Central Government. National exam is not a graduation requirement and only as a mapping of school quality. Quality mapping cannot only be left to the role of the national exam but must also be comprehensive through school accreditation because the UN only applies to students, while the quality of school is the whole process within a school.
- b) Infrastructure improvements for both to improve school quality in conducting a good PBM and for school to gradually able to hold UNBK in their schools.
- c) Parents and schools must build a good character and discipline of students to shape good behavior, discipline and confident. In addition of attention to students, the school should also pay attention to teachers as they have to hold a good and discipline teaching and learning process. The schools should dare to give disciplinary action to teachers who do not perform their duties properly.

Schools have to change the way of assessment of students from paradigm of final achievement to paradigm of process where good result will only achieved from good process. The final value is not the focus of evaluation, but the process or way of achievement.

- d) To improve the ability of teachers, the local Education Services need to initiate to hold trainings for teachers.

4.7. Actions For Improvements

The efforts to eliminate the level of cheating in national exam are not simple acts by simply removing the national exam as a determinant of students' graduation. The cheating in national exam has many sources that inter-related each other. Besides, cheating behavior is influenced by perceptions of students and parents that the high score of national exam is the ticket to future success. This perception is also reinforced by the community especially state university that keep recruiting the prospective students based on the average score of national exam.

From the planning of change above, there are two important points to conduct. First, the government gradually needs to improve facilities and infrastructures of schools to provide a good learning process to the students. In the information era right now, infrastructure to access the internet is very important that needs to exist in every school in the country. With the internet, both students and teachers can access various materials of learning so as to compensate for the limitations of textbooks in the school library. Second, provide trainings for teachers regarding the good learning methods and instill good behavioral attitudes among students.

4.8. Difference from Prior Work

This research provides a more holistic and comprehensive approach to the cheating phenomenon occurred in the UN as a result of a government policy and a chain reaction that occurred in the long term. Previous research only tried to find the factors that caused cheating situation in UN, or with seeing public opinion to the UN policy. But such research does not provide solutions in the form of conceptual models and recommendation to improve undesirable situation.

This research is closer to action research that widely applied in KM [32]; [33]; [34]. But the

research did not get to the implementation of the action.

Knowledge that is extracted through research is generated in the form of Rich Picture, Catwoe, Conceptual Models and action planning. However, the research does not aim to create an initiative of knowledge management system, as well as implementation of the resulting plan. This is only a recommendation to the decision makers.

5. CONCLUSION

The research aimed to explain the implementation of SSM in understanding the cheating in the UN and why it is still happening, even though the UN as a determinant of graduation has been removed.

Several things identified from the results of the research are as follows:

- Even though the UN is no longer as a graduation requirement of the student, but the UN results is still used by some state universities as a determinant of the acceptance of their new student candidates.
- The implementation of the UN in most schools is still paper and pencil - based, that provides opportunities for cheating.
- Assessment of student's achievement is still oriented on the final evaluation rather than the evaluation of the process. This has a disadvantage that leads to a momentary evaluation of the student. This is supported by the lack of self-confidence of the student that causes feelings of anxiety among students and parents.
- There are considerably differences in school quality among schools in Indonesia so that uniformity of measurement of students' abilities cannot be simply applied. Suburban schools, private schools and school outside Java have limited facilities and teachers that do not allow them to compete with schools in the big cities.
- The use of the UN as a mapping of school quality cannot rely on the UN which is limited, but must be accompanied by the accreditation of the school concerned.

The use of SSM in disclosing and describing the cheating problem in National Exam is very useful.

In addition to provide a method of analyzing unstructured problems systematically, SSM is able to extract a conceptual model of human activity as a tool to identify appropriate changes that can be made to improve the problem situation. Besides, there are rich picture, catwoe analysis and change plan that together provide learning media and brainstorm to find alternative solution for better improvement.

The weakness of this research is on the information used for the analysis. The research uses information from online media that is limited from 2015 to 2017. Limited time make not all news from online media can be captured. Beside, after 2017 the government has made many improvements to the National Exam with the use of computer-based exams. Therefore, there is an opportunity to make the further research whether the cheating behavior is still happening or not.

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