DEVELOPMENT MODEL OF INDONESIAN NAVAL CADETS IN THE FRAMEWORK OF CREATING RESOURCES SUPERIOR HUMAN

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ABSTRACT

Indonesian Naval Academy (AAL) is tasked with organizing the first education for Indonesian Navy volunteer officers at the academy level which produces Indonesian Navy officers who are tanggap, tanggon and trengginas. The purpose of education at AAL is to educate and train cadets to become future Indonesia Navy officers who are professional, able to adapt to science and technology, have a Sapta Marga spirit, and have the skills in accordance with the demands of the initial assignment on the Republic of Indonesia Warships (KRI) and Platoon Commander in the Marine Corps in order to support the duties of the Indonesian Navy. To realize Superior Human Resources, the Indonesian Naval Academy builds an Education system that is oriented towards the Tri Basic Patterns of Indonesia Armed Force Education, namely through Teaching, Training, and Nurturing Methods (Jarlatsuh) which cannot be separated from one another. Based on existing problems evaluation, assessment and development of the AAL education system need to be carried out. Evaluation is carried out using a system dynamic approach and Game Theory, namely by identifying the variables that affect Jarlatsuh and building a causal loop diagram followed by building the main model and its supporting submodels, to develop the AAL Graduate Quality model which consists of 4 (four) sub-models which include: AAL Graduate Quality Submodel. Teaching Submodels. Training Submodels. Nurturing Submodel. then implementing scenarios for intervening variables that need attention and determining policies using the Game Theory method with an approach to cooperative games by adopting the existing system in Japan's NDA.

Keywords: *Indonesian Naval Academy, NDA, system dynamics, Game Theory*

1. INTRODUCTION

The Indonesian Naval Academy, called AAL, is the Central Executive Agency of the Indonesian Navy which is directly under the Chief of Staff of the Indonesian Navy (Kasal). AAL is tasked with organizing the first education for Indonesian Navy officers at the academy level which produces Indonesian Navy officers who are responsive, responsive, and trengginas. The purpose of education at AAL is to educate and train cadets to become future Indonesian Navy officers who are professional, able to adapt to science and technology, have a Sapta Marga spirit, and have the skills in accordance with the demands of the initial assignment on the Republic of Indonesia Warships (KRI) and Platoon Commander in the Marine Corps in order to support the duties of the Indonesian Navy. (AAL, 2023)

The development of the world of education is increasing from time to time. This is marked by the many findings and innovations in the field of science and technology. These conditions require education practitioners to increase their contribution in an effort to produce quality and competitive resources, namely humans who have faith and devotion to God and mastery of science and technology in the future. However, to develop the quality of human resources, there are challenges and problems that must be faced by the nation, namely: the need to improve quality and added value, changes in the structure of society, increasingly fierce global competition, as

well as the influence and domination of developed countries in the mastery of science and technology.

To realize Superior Human Resources, the Indonesian Navy Academy builds an Education system that is oriented towards the Tri Basic Patterns of Indonesian Armed Force Education, namely through Teaching, Training and Nurturing Methods which cannot be separated from one another.

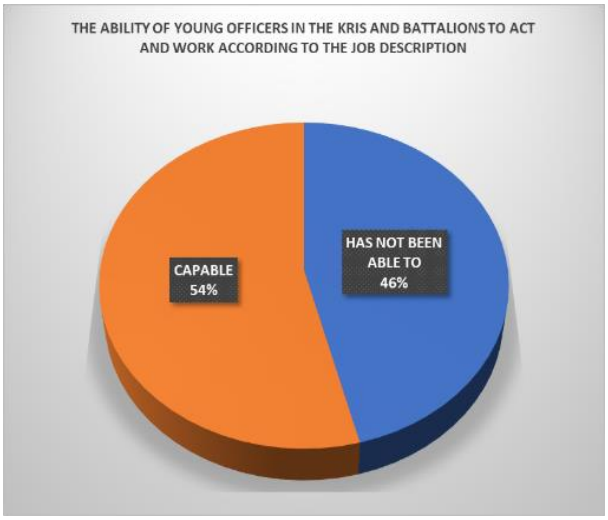


Figure 1. Diagram Based On Survey

Until now, the quality of AAL students is still not optimal. Based on survey data (observation and assessment) from users, namely the superiors of juvenile officers in the main command of the Indonesian Navy, it was found that 54% of

juvenile officers were still unable to meet the demands according to the Job description, while 46% of juvenile officers were able to meet the demands according to the Job Description. The survey results above indicate that the competency of AAL graduates' cadets must be increased so that they are able to support their main assignments in Indonesian War Ship and Marine Battalions. From some of the descriptions of the background and problems currently faced by cadets, it is necessary to evaluate, study and develop the AAL education system

2. LITERATURE REVIEWS

2.1 Character Building Theory

Character Building through Character Cultivation. The term cultivation is adopted from the word, cultivation means: "cultivation/work on agricultural land". Thus, character cultivation can be interpreted as an activity of cultivating character in a person according to the desired character. In terms of character empowerment, the term character cultivation is more appropriate than character building. In character cultivation, individuals are more positioned as the subject of activity and take an active role while in character building, individuals tend to be placed as objects of activity so that they are passive. (AAL, 2014)

2.2 System Thinking Theory

System Theory (System Theory) is a system term encompassing different machine, organism, psychological, and social systems with individual actions and parts. A system is a collection of elements and relationships separated by environmental boundaries that are always more complex than the system itself. (Hall, A. D., & Fagen, 1968)

Prahasta stated that the system can be interpreted as a set of components that are interrelated so that they can influence each other in a certain order/procedure in achieving a goal. In a large system, the smaller system will act as a separate component or sub-system. In a system, it will have characteristics including components, Environment (external entities expressed by system boundaries), Boundaries (which state which systems and which external entities), Interface (media that connects the system with its external entities), Input (data and commands/controls), Outputs (results of processing in the form of data/information, commands and the like), Procedures (which determine the relationships and work

sequences/roles of the components), Objectives (results/goals to be achieved by operating the system).(Prahasta, 2018)

2.3 Learning Theory

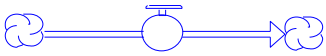
The learning theory put forward by Benyamin S, Bloom or better known as Bloom's Taxonomy theory is a theory that explains the domains of learning which consist of three domains, namely: cognitive, affective and psychomotor and each teaching domain has something different from the others.(Degeng, N. S., & Sudana, 1989)

2.4 Dynamic System.

Sterman (2000) defines that system dynamics is a method for enhancing learning in complex systems. Furthermore, this method is illustrated as a simulation in the cockpit of an airplane for management to understand in learning complex dynamics, understand the sources of resistance (barriers) in policies and design more effective policies. Understanding the complexity of the system dynamics is based on the theory of non-linear dynamics and feedback control developed in the disciplines of mathematics, physics and engineering.

One of *software* who can run a dynamic system simulation model by paying attention to the three types of variables above*System Thinking Educational Learning Laboratory with Animation* (STELLA).

Table 1. Symbol in STELLA software

NO	symbols	Explanation
1		*FLOW / RATE*
2		*LEVEL / STOCK*
3		*CONVERTER*
4		*CONNECTORS*

Below is an explanation of the terms and symbols used in the STELLA software:

a. Rate is activity, movement or flow that contributes to the change per unit time in the Level variable. Rate is the only variable that affects the Level variable.

b. Level is a variable that can accumulate over a period of time. The Level variable is influenced by the Rate variable. The symbol for Level is a rectangle with the variable name listed at the top of the symbol.

c. The converter holds constant values, defines external input to models, calculates algebraic relationships and serves as a repository for graphical functions. In general, converting inputs into outputs. NameThe converter is shown below the symbol.

d. Connectors are used to connect the various elements of the model. Connections can be between Levels, between Converters, Rate to Converter, Converter to Rate and Level to Converter.

3. RESULTS AND DISCUSSION

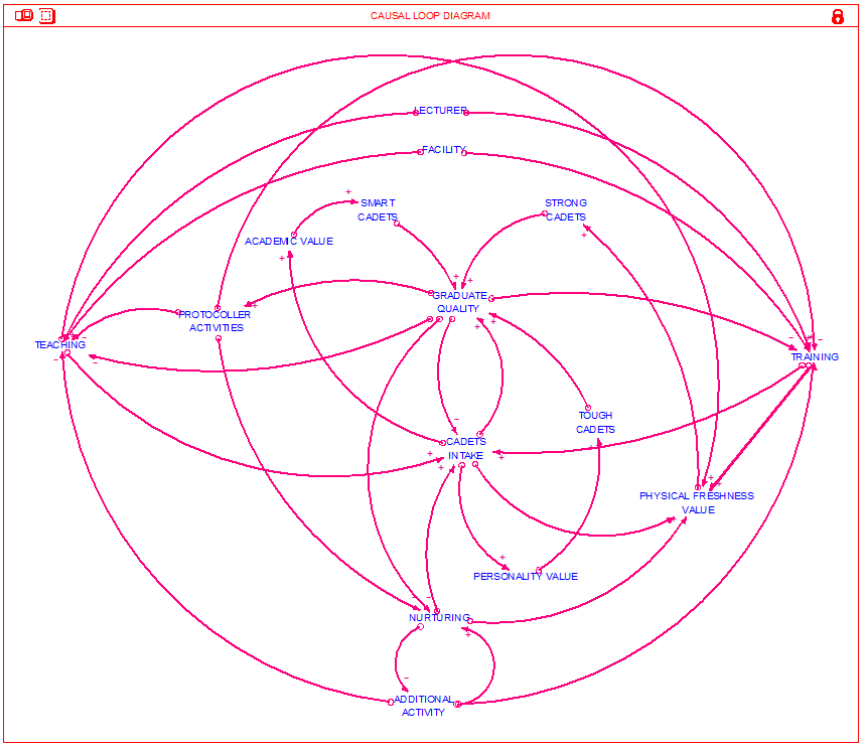
Data collection is carried out to obtain the information needed in order to achieve research objectives. In this research, data collection techniques were carried out through observation, interviews and documentation/literature study. Primary data through observation and interviews (in-depth interviews), namely data collected and processed by researchers from the subject or object of research. While secondary data through documentation/literature study is data obtained indirectly from the subject or research object.

The data collection techniques used in this study were divided into two, namely:

a. Primary data collection was obtained from informants who served in AAL, Disdikal, Dispsial, Disbintalal. This data was obtained by conducting interviews and administering questionnaires to informants/experts regarding the research problem, namely the Development Model for the Indonesian Navy Academy's Parenting System in Realizing the Vision and Mission of the AAL

b. Secondary data collection was obtained from literature, articles, journals and compilations of regulations relating to the research conducted.

The approach method used in this research is a quantitative approach. A quantitative approach was applied in this study through the results of a questionnaire which was then formulated mathematically the relationship between variables according to the specification structure in the System Dynamics Method. Through system dynamic modeling, stocks and flows can be identified that influence the formulation of scenarios and the Game Theory method is used to determine strategies and policies from the scenarios obtained.



Figures 2. Causal Loop Diagrams

In the figure 2 is the structuralization of the model and system that occurs in the AAL Cadets Development system. The structuralization is modeled in the form of a causal loop diagram (CLD)

or a causal diagram of all the variables that affect the AAL Cadets Development system. From the conceptualization of the causal loop diagram model above, it can be seen that the AAL Cadets Development system is influenced by the development of system dynamics from 3 (three) variables, namely the Teaching, Training and Nurturning. The variables that affect the three variables are defined according to the identification of the variables that have been done before.

3.1 Identification Of Variables

The initial step in conceptualizing AAL Cadets Development is identifying the variables that influence AAL Cadets Development. The purpose of identifying this variable is to deepen knowledge of the object under study. The variables identified are variables related to the level of implementation of the education system and interact with AAL Cadets Development.

Based on the AAL Cadets Education Implementation Program (Book IV) and the identification of all influential variables, the Cadets Development variables can be categorized as including 3 (three) sub-models namely: Teaching, Training and Nurtuning. The following is the identification of the variables shown in Table 1

Table 2 Identification of Main Model Variables of AAL Cadets Development

The Main Model of AAL Cadets Development		
No.	**Variable**	**Description**
1.	Teaching	Methods of implementing education in the form of lectures/face-to-face and instructional in class with the aim of introducing/understanding/mastery of academic knowledge in the context of forming the personality of Sapta Marga warriors with an emphasis on intellectual aspects (intelligence)
2.	Training	Methods of implementing education in the form of field applications with the aim of strengthening understanding/mastery of academic knowledge in the context of forming Sapta Marga fighters with an emphasis on skill (psychomotor) aspects
3.	Nurtuning	The method of implementing education is in the form of guidance and counseling with the aim of instilling and strengthening cultural values and mastery of academic knowledge in the context of building the character of Sapta Marga warriors with an emphasis on aspects of fighting, character, behavior and ability to implement leadership and organize.
4.	Quality of AAL Graduates	Graduation Achievement Score obtained from the Cumulative Grade Point Average, Cumulative Personality Score and Cumulative Physical Competence Score from Semester 1 to Semester 8

The table above presented encompasses three crucial variables: teaching, training, nurturing, and the quality of graduates. Each of these variables plays a significant role in constructing a complex system within the framework of system dynamics, as illustrated in the diagram below. The

interconnectedness and interdependencies among these variables form a dynamic network that influences the overall performance and outcomes of the system. The variable of teaching involves the methods, approaches, and effectiveness of imparting knowledge and skills to students. Training encompasses the development of practical abilities and specialized expertise relevant to the field of study. Nurturing entails the provision of guidance, support, and mentorship to foster personal and professional growth among learners. Lastly, the quality of graduates represents the overall competence, knowledge, and preparedness of individuals upon completing their education. Together, these variables interact and impact one another, shaping the dynamics of the system and ultimately influencing the outcomes of the educational process.

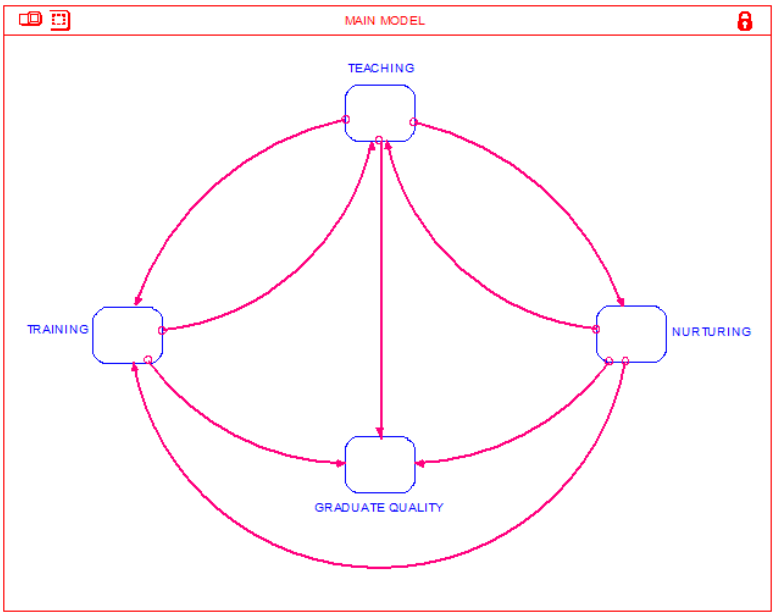


Figure 3. Main Model

Basically, the relationship between variables has been explained in the causal loops diagram. The purpose of building a causal loop diagram is to describe the relationship between each variable, while the purpose of the main model system is to simplify and explain the relationship of the stock and flow diagram. So as to provide an overview of the relationship between the major systems in a model. The objective system is modeling the teaching, training and upbringing of AAL cadets that affect the quality of AAL graduates. At this point it is explained that there are sub-models for each variable that influence one another. In each model, there are many variables that can affect other variables either inside the model or outside the model. The sub-model relationship variable is illustrated by the red line in Figure 4.

4. CONCLUSIONS AND SUGGESTIONS

After understanding the conceptualization of the system in the causal loop diagram model of AAL Graduate Quality as shown in Figure 3, the next step is to develop the AAL Graduate Quality model which consists of 4 (four) sub models which include:

a. AAL Graduate Quality Submodel.
b. Teaching Submodels.
c. Training Submodels.
d. Nurtuning Submodel.

In this section, a research discussion is carried out by displaying and translating the causal loops model into a stock and flow diagram model, followed by model verification and validation. After verification and validation, the next step is to create a dynamic model simulation to measure the Quality of AAL Graduates and look for the variables that have the most significant impact. After preparing scenarios and intervening variables that need to be improved, he implementation model for AAL Graduate Quality is made by compiling stock and flow diagrams based on the causal loop that has been prepared. The stock and flow diagram created is a more detailed description of the system previously shown by the causal loop diagram. In this diagram, the influence of time on the relationship between variables is considered, so that later each variable is able to show the accumulated results for the level/stock variable, and the variable which is the rate of system activity for each time period is called rate/flow. In this case the rate is the only variable that affects the level. While the converter is a variable that is a flow of information that has a constant value. Connectors are used to connect one variable to another, which connects the converter with the converter, connects the converter to the rate, connects the level to the rate and connects the level to the converter. The model compiled in this study uses time units of year to display changes to the current systemthe next step is to implement Game Theory on the intervening variables by adopting the situation applied in NDA.

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