The Success Of Team Collaboration In Supporting Systems For Development Of Project Management Learning Model

By Adi Bandono

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Abstract – The development of a learning model cannot be developed individually, without careful planning, strong leadership, effective and efficient organization, and continuous monitoring and evaluation. The success of a lesson is largely determined by the effectiveness, efficiency, and attractiveness of learning. The problem under study is how to determine several success criteria that affect collaboration from various parties as a supporting system in producing an effective, efficient, and attractive learning model at the Indonesia Naval Technology College (STTAL). The research method used is a combination method, a combination of qualitative and quantitative, with the process of collecting data through interviews and questionnaires to six experts in charge of developing learning models at the Indonesia Naval Technology College. Meanwhile, data analysis used Delphi and Borda techniques. The results showed that the six successes of collaboration in the formulation of learning models at the Naval College of Technology lie in the success of the team in building a shared commitment to one vision (17.4%), the intrinsic motivation that encourages a willingness to collaborate (12.5%). High Order Thinking (HOTS) ability (12.5%) which affects the accuracy in solving problems, managerial and leadership (10.3%) which affects the governance or project managerial ability, supporting infrastructure (9.6%), and budget (9%).

Keywords – Learning model, Successful Team Collaboration, Combination Methods, Delphi, Borda.

I. INTRODUCTION

According to Bandono (2020) who developed a Naval Collaboration Flexible learning Model (Bandono, Rahman, & Suharyo, 2020), and (Bandono, Bastari, & Suharyo, 2020), that in developing a learning model, it cannot be developed individually, without careful planning, strong leadership, good organization. effective and efficient, as well as continuous monitoring and evaluation. The success of a lesson is largely determined by the effectiveness, efficiency, and attractiveness of learning. To meet the criteria, be effective, efficient, and attractive, in developing a learning model, stakeholders must support each other in a system. Stakeholders as a supporting system consist of educators, students, material experts, educational technology experts, information technology experts, librarians, and others who are related. The Collaboration Model that is built is developed based on partnership, mutual need, and mutual benefit, flexible and sustainable relationships, considering that a learning process is continuous and continuous.

The team that is formed must be a work team that supports each other, starting from the analysis stage, the design and development stage, the evaluation stage, and the installation stage. The analysis stage is an investigation effort into a learning event to obtain information which is carried out in-depth and thoroughly to solve learning problems. Voerman and Gustafson stated that almost all learning developers have the same view, that in designing learning, they must go through an initial phase, namely analysis activities first. Given the importance of analytical activities, the analysis stage is placed first and foremost. At this stage of the analysis, the main steps are defined including forming a participatory team and carrying out a condition analysis. The participation team that was formed involved many parties related to the development of the model such as developers, learners, material experts, learning technology experts, media experts, students, practitioners, and so on. As for the condition analysis activities, the focus of the analysis is more focused on needs analysis, analysis of the objectives and characteristics of the field of study, analysis of learning resources, and analysis of student characteristics.

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After going through the analysis stage, the next step is to continue the design and development stage. The design stage focuses on the preparation of a blueprint for the model, while the development stage focuses on making a model product prototype based on the blueprint that has been compiled. The activities at the design and development stage are a continuous cycle and an inseparable unity (Bunce, 1996).

At this design and development stage, learning strategies are set to be used, including organizing strategies, delivery strategies, and learning management strategies and added with learning assessment strategies. The existence of a learning assessment strategy as part of a learning strategy is quite important considering that the assessment strategy is a continuous cycle and cannot be separated from the other three learning strategies.

Evaluation Phase. The notion of evaluation refers to Frey and Overfield's opinion as a systematic process of collecting, analyzing, and interpreting data or information to determine whether learners have achieved learning objectives. The Joint Committee on Standards for Education Evaluation defines evaluation as systematic or regular research on the benefits or uses of several projects or programs. Furthermore, according to Kaufman and Thomas, evaluation is defined as a process of identifying gaps, needs, goals, and objectives, which then produces ways to fill gaps, fulfill needs, and make decisions for change to achieve predetermined goals and objectives. So it can be concluded that the notion of evaluation in the context of the evaluation of a learning model is a systematic process in collecting data, analyzing, interpreting information or data to be used by a developer to make decisions to answer problems or improve the quality of the learning model developed. Through evaluation activities, it will be possible to determine the value of a program, a technique, a method, including the value of a learning model.

The stages in the process of developing a learning model require collaboration from various parties as supporting systems in producing an effective, efficient, and attractive learning model. The formation of a participatory team at the beginning of development activities greatly determines the quality of the process and learning outcomes, involves various components in a particular system, and requires thought, collaboration, and participation from various parties. Willis pointed out the importance of forming a participatory team at the beginning of the learning model development activity. Apart from Willis, learning design experts who consider it necessary to form a participatory team are Oshima J., Oshima R., Inagaki, Takenaka, Kakayama, Yamaguchi, Murayama, Sanghi, Du Four, and the Annenberg Institute for School Reform.

In this study, several things will be analyzed that greatly influence the collaboration of various parties as a supporting system in producing an effective, efficient, and attractive learning model. The process of determining influential criteria is carried out by using the Delphi technique which is given to several competent stakeholders in the development of learning models at the Naval College of Technology, then some of these criteria will be weighted so that the criteria that affect the collaboration process as a supporting system are determined effective learning.

This paper has many literatures to support the research, such as literature with title The use of value clarification technique-based- picture story media as an alternative media to value education in primary school (Fariyatul & Bandono, 2017), STTAL Development Strategy To Produce Human Resources That Acknowledge Technology Facing The Industrial Revolution Era 4.0 (Mashudi, Rahman, Bandono, & Hasan, 2019), Learning style preferences of medical students: A single institute experience from Saudi Arabia (Ayesha, Salem, Quadri, & Al-Hamdan, 2011), The Learning styles and personalities traits of undergraduate: A case at a state university in Istanbul (Erdal, Kiziltepe, Seggie, & Sekerler, 2014), The learning styles and the preferred teaching—learning strategies of first year medical students (Kharb, Jindal, & Singh, 2013), Effectiveness of web-based learning opportunities in a competency-based program (Jiang, Parent, & Eastmond, 2006), A meta-analysis of effectiveness studies on computer technology-supported language learning' (Grgurovic, 2013), Transforming teacher education method course through technology: Effects on preservice teachers' technology competency (Angell, 2005), Promoting open educational resources-based blended learning (Sandanayake, 2019), Impact of Social Media on Consumer Behaviour (Voramontri & Klieb, 2018), Borda count Method for Fiscal Policy (Ishida., 2017), Three Competing Models on Customer Loyalty in the Context of Mobile Subscribers (Akbar, 2013), The Elaboration Theory of Instruction, dalam Reigeluth, C.M., (Ed). Instructional-Design Theories and Models: An Overview of their current status (Reigeluth & Stein, 1983).

The research was organized as follows, part 1 was the introduction, part 2 presented the literature review and methodology, section 3 presented the results and data analysis, and part 4 presented the conclusions.

II. MATERIAL AND METHODS

2.1. Understanding the Learning Model.

In essence, the learning model is a set of components of an integrated learning strategy and is described as a complete method with important parts which are described in detail as a guide in carrying out learning practices (Afzaal, Siau, & Suhali, 2019). The learning model according to Seels, Richey, Gros, Reigeluth, and Wilson is a means of translating theory into learning practice or formulating a theory based on practical findings. The model bridges theory and practice, meaning that the model translates from theory into the world of concrete and practice, and vice versa, through practice, a theory will be created. Therefore a model is

prescriptive. As a model, the entire series of activities is based on theories, including systems theory, communication theory, learning theory, and learning theory. This means that a model must be able to bridge theory and practice (Amory, 2007).

Why is a model needed in learning? What is the real urgency of a model? These two questions lead to what role models play in improving the quality of learning. Regarding the role of the model in learning, it can be explained as follows: a). For developers and learning scientists, learning models have an important role as a means of translating theory into learning practice. Learning theories are one of the foundations for implementing learning practices or actions appropriately as needed so that the expected goals can be achieved. b). For learners or learning practitioners, learning models play an important role in helping determine and choose learning actions appropriately. With various kinds of learning models, learning practitioners will be able to more easily and freely choose, determine, and apply the right model for the learning practices they carry out. c). For students, the learning model plays an important role in providing fluency and convenience for learners in finding more appropriate ways to carry out the learning process according to their learning needs. Through the application of the learning model appropriately, it is hoped that students will be able to achieve learning objectives effectively, efficiently, and attractively (Alammary, Sheard, & Carbone, 2014).

2.2. Collaboration.

According to Elizabeth E. Barkley in his book Collaborative Learning Techniques, said collaborating means working together with other people. Collaborative learning practice means working in pairs or small groups to achieve shared learning goals. Collaborative learning means learning through group work, not learning in isolation.

Collaboration is a form of social interaction. According to Abdulsyani, Collaboration is a form of social process, in which there are certain activities aimed at achieving common goals by helping and understanding each other's activities (Gokhale, 1995).

The reason for the need for collaboration in preparing an effective learning model is As quoted by Abdulsyani, according to Charles Horton Cooley, collaboration occurs when: 1) People realize that they have the same interests and at the same time have sufficient knowledge and control over themselves to fulfill their interests. - these interests through collaboration. Effective learning models require careful planning so that collaboration is needed. 2) Awareness of the existence of common interests and the existence of an organization are important facts in a useful collaboration. The main thing in collaboration is to support the realization of an effective learning model, which is the same main goal of creating a learning model through a process of planning, analysis, and development. Collaboration can occur when a person or group of people can benefit or benefit from another person or group, and vice versa.

Given the importance of collaboration in developing a model, model development must begin with the formation of a participatory team. The participation teamwork pattern is coordinated, meaning that in organizing activities there are no superiors' subordinates, no leaders and those who are led, and in the form of partnerships. Participation team members are networks that work together according to their roles and functions through coordination channels and means by establishing direct relationships between project leaders and network members (Haverila, 2010). A direct relationship means that the project leader communicates directly either face-to-face or online. Meanwhile, network members can also be in direct contact with each other, meaning that there is direct communication. The views between the members of the network have a close relationship with each other (Siggh & Puja, 2017). The project leader's task is to identify, synthesize, and formulate the relationship between these thoughts and views to produce a complete concept. The developer's direct relationship with network members can be described as follows:
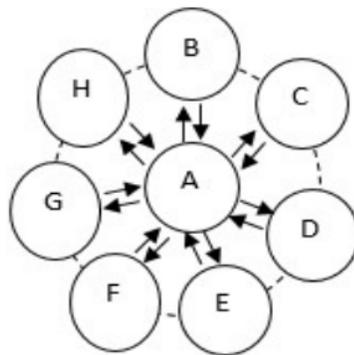

Figure 1. Participation Team Collaboration in Model Development.

2.3. Methodology

To solve a problem in observed research, steps are needed and determined to describe the approach and model of the problem. The steps taken are:
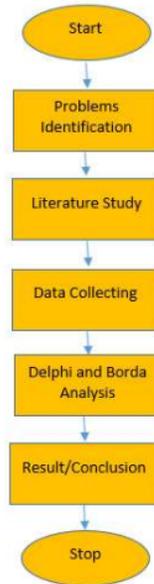

Figure 2. Research flow chart

Objective: The purpose of this study is to determine the various criteria that affect the success of collaboration in developing a learning model at the Navy College of Technology. Some of the influencing criteria are shared commitment that builds a shared vision, intrinsic motivation that encourages a willingness to work together, High Order Thinking Ability which affects accuracy in solving problems, technological, educational, managerial, and leadership abilities that affect project governance or managerial skills. , supporting infrastructure and budget.

Steps: This research step is step 1 to identify problems that affect the success of collaboration in formulating learning models at the Naval College of Technology. Step 2 conducts literature studies, collects data, and analyzes data collected, step 3 analyzes data using Delphi and Borda techniques, step 4 provides suggestions for improvements and conclusions.

This research was conducted in a period of 1 year, from January 2020 to November 2020 with observations of the successful collaboration in the formulation of learning models at the Naval College of Technology. Respondents in this study were competent stakeholders in determining the learning model at the Naval College of Technology which consisted of 6 people. The results of this study are strategies that affect the success of collaboration in the formulation of learning models at the Naval College of Technology based on weighting criteria analysis.

III.   RESULTS AND DISCUSSION

3.1   Delphi analysis to refine and form criteria.

The Delphi process is carried out by asking questions to experts to obtain several criteria that are very influential in the successful collaboration of developing learning models at the Naval College of Technology. Some of the existing criteria were then confirmed to other experts in turn until a criterion was found that was agreed upon by the experts in compiling learning models at the Naval College of Technology.

Team Learning is a process of aligning and building team capacity to achieve common goals. This is one of the characteristics of a Learning Organization. An organizational life will grow well if its members have an understanding of common goals and both improve themselves by learning continuously according to their respective capacities or competencies. Usually, team members have personal potential (personal mastery) and a strong mental model, can think holistically or systemically and have the insight to achieve a common vision.

In essence, the learning process knows no differences, regardless of one's life background. Humans and other living things are required to remain able to adapt so that they can survive. Adapting requires innovation and the ability to be creative. And all of this can be obtained by learning, both individually and collectively.

For clarity and certainty in the direction of the team's goals, the vision that is built must be agreed upon and understood together. The roles of different members can be carried out but still in the same corridor of goals. The combination and collaboration that is also built through dialogue and discussion from the dissatisfaction phase to production will produce something extraordinary. The learning process in a team will be effective if it is based on openness to changes that are currently developing, up to date, and applicable. This can be applied in organizational life to achieve these shared goals.

Innovations will be generated by continuously developing the learning process at both the personal and team levels. So the learning team can create innovative work and in some ways become a pioneer of renewal of the values or prevalence that developed at a time. Team learning in forming a learning organization, the process must be through a series of interactions between its members. It could be in the form of dialogues, discussions, seminars, and maybe even debates. Dialogue is two-way communication in which the first party asks a question and the other party explains or clarifies so that the same understanding is reached, regardless of whether they agree or not. Meanwhile, the discussion is a form of multi-way communication between various communicators to get a consensus on the topics being discussed.

Intrinsic motivation is the motivation that comes from one's own willingness to do something without clear external rewards such as getting a gift or bonus. An example of intrinsic motivation is when you do a new job and feel confident that the job will benefit you personally. With that belief, you will enjoy the process and volunteer to do it. This kind of intrinsic motivation is great to have and to maintain because you don't need anyone else to inspire or encourage you. Also, this form of motivation lasts longer because it comes from self-belief.

Motivation is an effort to direct employees to work more optimally following the wishes of the company. Saydam has provided an explanation of the objectives of motivation, namely, 1) Increasing work performance, 2). Improve work discipline, 3). Increase passion and morale, 4). Increase productivity and efficiency, 5). Foster a sense of employee loyalty to the company, 6). Increase a sense of responsibility, 7). Change employee behavior following the wishes of the company.

Intrinsic motivation comes from within the individual. This motivation results in the integrity of the goals, both organizational goals and individual goals, both of which can be satisfied. Meanwhile, according to Permana, quoting from Nawawi gave the opinion that intrinsic motivation is a work motivation that comes from within the worker as an individual, in the form of awareness of the importance of the work being carried out. Intrinsic motivation in collaboration in the formulation of learning models at the Naval College of Technology is needed because this factor arises from individual awareness.

Thinking is defined as the activity of reason to process knowledge received through the five senses and is intended to seek the truth. Thinking is also a conscious use of the brain to find causes, argue, consider, predict, and reflect on a subject. The thought process is a sequence of mental events that occur naturally or planned and systematically in the context of space, time, and the media used, and results in a change to the object that affects it. A thought process is an event of mixing, matching, combining, exchanging, and sequencing previous concepts, perceptions, and experiences.

Higher-order thinking skills (HOTS) are a component of creative thinking skills and critical thinking. Creative thinking and critical thinking can develop a person to be more innovative, have good creativity, ideal, and imaginative. When the collaborative learning model development team knows how to use these two skills, it means that the collaborative learning model development team can think, but part of the collaborative learning model development team must be encouraged, taught, and helped to be able to apply higher-order thinking. HOTS must be taught and learned. The entire collaborative learning model development team has the right to learn and apply thinking skills, as well as other knowledge.

HOTS is a thinking activity that is not just memorizing and conveying information that is already known. But higher-order thinking skills are also the ability to construct, understand, and transform existing knowledge and experience to be used in making decisions and solving problems in new situations and this cannot be separated from everyday life.

In thinking skills, several principles must be considered, namely: 1) Thinking skills are not automatically owned by the collaborative team for the preparation of learning models. 2) Thinking skills are not a direct result of teaching a field of study. 3) In fact, the collaborative team for the preparation of learning models rarely transfers these thinking skills by themselves, so that guided training is needed. 4) Teaching thinking skills requires a learning model that is centered on the preparation of a learning model.

In real conditions, managerial institutions in educational institutions are often faced with several learning system problems, ranging from the preparation of infrastructure, materials, objectives, and even to the preparation of learning processes and models. In its development, educational institutions as a non-profit oriented institution have forced education implementers to use several theories that have previously been developed in the economic world. So it is not surprising when we hear of an educational theory that is taken from management theories in the business world. In such conditions, a person who carries the mandate to develop a

learning model in the world of education is as expected from the meaning of education itself. So at least the collaborative team for compiling a learning model understands how the actual process of the development of management theory developed in the world of education.

Leadership managerial abilities that affect governance skills in collaborative learning model formulation are (1) ability as a supervisor (2) intelligence (3) initiative (4) physical and mental energy (5) awareness of goals and direction (6) emotional stability (7) objective (8) assertiveness in making decisions (9) communication skills (10) teaching skills (11) social skills (12) knowledge of human relations.

Some assessments of the reasons for successful collaboration in developing a learning model at the Naval College of Technology based on expert judgment are a shared commitment that builds a common vision, intrinsic motivation that encourages a willingness to collaborate, High Order Thinking Ability which affects the accuracy in solving problems, managerial and leadership that affects the governance or project managerial ability, supporting infrastructure and budget. From determining the criteria obtained from the Delphi result process, the order of priority will be determined using Borda analysis.

3.2 The determination of the criteria weight using Borda analysis.

Group Decision Support Systems were very popular in the 1980s as a tool in finding solutions to solve problems in workgroups, so this system is also called a group decision support system. There are three important steps in solving problems in this system, namely a). Determination of criteria and alternatives. b). Evaluation of the criteria preference value against alternatives by decision-makers in each section. c). Evaluation of weight values is collected into one group to determine group choice alternatives.

The Borda method put forward by its founder Jean Charles de Borda in the 18th century is one method that can be used in determining the best alternative which is selected from several alternatives. Each alternative will be ranked based on its weight to be used as an option for decision-makers. The greatest weight is the first rank of the best alternative from the decision-maker choice.

The specialty of the Borda method is that it can overcome difficulties with other methods where something that is not ranked first is automatically eliminated. The basic idea in the Borda analysis method is to weight the choice of criteria so that they are sorted into the first rank, second rank, and so on. The assessment of the importance of the criteria is carried out as follows, ranking the most important criteria first, and ranking the criteria that are considered less important in the next ranking order. The next step is that the first ranking value is changed to a weighted ranking m-1, and the second-ranking is changed to an m-2 weighted rank, where m rank becomes a weighted ranking m = 0.

Criteria validation is carried out by assessing the importance level and ranking the criteria, where the criteria considered The most important preference is placed 1st, then the criteria that are considered less important are placed 2nd, and so on. until the 4th order according to the number of predetermined criteria. Then the data is then reprocessed through a recapitulation process which results in a recapitulation of the expert questionnaire.

Table 2. Results of the recapitulation of the criteria questionnaire data

No	Criteria	Code	EXPERT ASSESSMENT ORDER					
			X1	X2	X3	X4	X5	X6
1	Y1	K1	3	3	2	3	4	3
2	Y2	K2	5	2	3	4	5	2
3	Y3	K3	7	4	4	6	6	1
4	Y4	K4	9	6	5	7	7	10
5	Y5	K5	1	8	6	10	1	9
6	Y6	K6	2	10	1	9	2	8
7	Y7	K7	4	1	10	8	3	7
8	Y8	K8	6	5	9	1	8	5
9	Y9	K9	8	7	8	2	10	6
10	Y10	K10	10	9	7	5	9	4

After the recapitulation results are obtained, the next step is to carry out the criteria weighting process using the Borda method to obtain criteria based on the results of the ranking order.

Figure 3. Selection criteria ranking results

Based on the results of the total weight value in Figure 3.1 above, it is known that the success of the collaboration in the formulation of learning models at the Navy College of Technology is:

Table 3. Results of weighting criteria for the success of Collaboration

No	Code	Strategy	Weight
1	X3	A shared commitment that builds a shared vision	0.174
2	X4	Intrinsic motivation that encourages a willingness to collaborate	0.125
3	X2	High Order Thinking ability which affects the accuracy in solving problems	0.125
4	X6	Managerial and leadership influences on project governance or managerial	0.103
5	X5	Supporting infrastructure	0.096
6	X1	Budget	0.096
7	X7	Time discipline	0.085
8	X9	Ability in terms of technology	0.062
9	X10	Education	0.070
10	X8	Workplace comfort and educational facilities	0.059

The results of the analysis in the Borda method are the final decisions that are used as the results of group decisions where the initial data is in the form of a strategic approach table carried out with the previous Delphi analysis then made in the form of a matrix table. From the results of various value data obtained then it is processed again at the stage of determining the alternative value which is carried out by giving the first ranking value with the value of n-1 where n several alternatives. In table 3.2 it can be seen the results of determining the alternative value where the success criteria X3 get a total weight value of 0.174, the success criteria X4 get a total weight value of 0.125, the success criteria X2 get a total weight value of 0.125, the success criteria X6 get a total weight value of 0.103, the success criteria X5 get the total weight value is 0.096, the success criteria X1 get a total weight

value of 0.096, the success criteria X7 get a total weight value of 0.085, the success criteria X9 get a total weight value of 0.062, the success criteria X10 get a total weight value of 0.07, the success criteria X8 get a total weight value 0.059.

From the results of the weighting of the criteria, it is known that the six successes of collaboration in the formulation of learning models at the Naval College of Technology, namely the success of the team lie in a joint commitment that builds a shared vision (17.4%), an intrinsic motivation that encourages a willingness to cooperate (12.5%), HOTS (High Order Thinking) ability (12.5%) which affects the accuracy in solving problems, managerial and leadership (10.3%) which affects the project governance or managerial ability, supporting infrastructure (9.6%), and budget (9%).

In building successful collaboration to develop a learning model at the Naval College of Technology, it is necessary to build intrinsic motivation in lecturers. The spirit of collaboration must always be cultivated and ignited in various ways that can inspire the spirit of collaboration by using various methods. One of the efforts to build successful collaboration in developing a learning model at the Naval College of Technology, lecturers must have a shared commitment that builds a shared vision, intrinsic motivation that encourages the willingness to collaborate. The commitment and intrinsic motivation of the lecturers will determine the success of the collaboration to develop a learning model at the Indonesia Naval Technology College (STTAL).

IV. Conclusion

Based on the results of the analysis and discussion, the following conclusions can be drawn:

a. Some assessments of the reasons for successful collaboration in developing a learning model at the Naval College of Technology based on expert judgment are a shared commitment that builds a common vision, intrinsic motivation that encourages a willingness to collaborate, High Order Thinking Ability which affects the accuracy in solving problems, managerial and leadership that affect the governance or project managerial ability, supporting infrastructure and budget

b. From the results of the weighting of the criteria, it is known that the six successes of collaboration in the formulation of learning models at the Naval College of Technology, namely the success of the team lie in a joint commitment that builds a shared vision (17.4%), the intrinsic motivation that encourages a willingness to cooperate (12.5%), HOTS (High Order Thinking) ability (12.5%) which affects the accuracy in solving problems, managerial and leadership (10.3%) which affects the project governance or managerial ability, supporting infrastructure (9.6%), and budget (9%).

V. Recommendation

Following the results of the above research, the main recommendation is that there is a need for a strong joint commitment in building a common vision and high motivation from the lecturers to realize collaborative development of quality learning models at the Naval College of Technology.

VI. Acknowledgements

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