

Evaluation of the Implementation of Information Technology-Based Survey Practice and Hydro-Oceanographic Mapping Practices

Kukuh Suryo Widodo, Bedjo Sujanto, Mukhneri Mukhtar

Abstract: *Practice Training Survey is an activity in the teaching and learning process for one or more subjects to provide the knowledge and skills of the Hydrographic profession. The purpose of this study was to find out the implementation of the Hydro-Oceanographic Survey and Mapping Practice as a means of developing knowledge and skills for the achievement of education that would use Information Technology facilities. The method used by the Kirkpatrick model. This model uses four levels, namely: level of satisfaction, level of understanding, behavior change and impact produced. Thus, the implementation of Survey Practice and Mapping Practices become more effective. In order for the Implementation of the Practice Survey and Hydro-Oceanographic Mapping to be able to equip students with behaviors that support the assignment.*

Index Terms: *Kirkpatrick Model, Hydro-Oceanographic Mapping, Information Technology*

I. INTRODUCTION

The Republic of Indonesia Presidential Decree Number 164 of 1960 concerning the Merger of Hydrographic Officials of the Shipping Department of the Sea Transportation (MARKAS BESAR ANGKATAN LAUT DINAS HIDRO-OSEANOGRAFI, 2006) Department at the Navy Hydrographic Bureau explained that the Navy's Hydro-Oceanographic Service (Pushidrosal) carried out the function of carrying out Hydro-Oceanographic surveys and mapping for national interests. The duties and functions of Pushidrosal as the Navy's Hydrographic and Oceanographic Development Kotama are realized through the Operations of Hydro-Oceanographic Surveys and Mapping (TNI Angkatan Laut, 2017) (Operation Surta Hidros) which include survey, mapping, research and information purposes in order to support navigation safety in the sea for the benefit of TNI as well as public (public) interests. Achievement of Pushidrosal tasks in the future as an organization to guide the function of hydro-oceanographic surveys and mapping which includes surveying, mapping, research and information (Hydrography and Oceanography Center, 2017) purposes in order to support navigation safety at sea for TNI interests and interests. public (public) will be faced with a spectrum of increasingly complex task challenges that are realized with the professional capabilities of their personnel in transforming

science and technology to support the implementation of Operation Surta Hidros. The logical consequence of these conditions, Pushidrosal requires professional personnel in the field of Science-based Hydrography. That is, Pushidrosal requires personnel with professional qualifications in the "hydrographic profession" (Gurlt, 1865) to support the achievement of organizational tasks (Pushidrosal). Hydro-Oceanographic Specialization Education (Dikspespa Hidros) is one type of "Specialization Development Education (Dikbangspes)" for the hydrographic profession group for Officer (First Officer) strata in the Naval Training and Education Command (Kodilatal) environment. Transfer the experience becomes an important part of student assessment and is given in 2 (two) sections: practical lessons and practical exercises. As education that obtains equal recognition with Hydrographic Surveyor Training Course category B, the FIG-IHO-ICA standard program, practical lessons and practical training are subjects to measure student learning success through transfer of instructor experience. Pusdikhidros TNI AL in this case the School of Hydros Officers (Sepa Hidros), in the implementation of the Dikspespa Hidros always evaluates at the end of the implementation of education. With the development of information technology (IT), all evaluations will later utilize IT tools to support evaluations to get better and more structured results and have in-depth and holistic digital record information about the effectiveness of the Surta Hidros Practice Training.

II. LITERATURE REVIEW

The importance of conducting practical training as part of the implementation of the Hydrospective Dissemination was emphasized in the Decree of the Navy Chief of Staff Number: Kep / 207 / II / 2010 dated 11 February 2010 concerning Book I (Basic Education Program and Framework) and Book II (Educational Events and Value Prices) (Markas Besar-TNI Angkatan Laut, 2012) Specialization of Hydro-oceanographic Officers who explain practical training at the Hydrospecific Office of Education includes Survey Practice and Hydro-Oceanographic Mapping (Lattek Surta Hidros) (200 hours of study). The Standard of Competence For Hydrographic Surveyors S-5 describes the Hydrographic Surveyor Training Course Course B program as follows:

Revised Manuscript Received on September 22, 2019.

Kukuh Suryo Widodo, Manajemen Pendidikan/ Universitas Negeri Jakarta, Indonesia, ksuryowidodo@yahoo.com

Bedjo Sujanto, Manajemen Pendidikan/ Universitas Negeri Jakarta, Indonesia

Mukhneri Mukhtar, Manajemen Pendidikan/ Universitas Negeri Jakarta, Indonesia

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Hydrographic Surveyor Training Course category B The program is a program which provides practical understanding of hydrographic surveying for individual with the skills to carry out the various The hydrographic surveying tasks in the Standard of Competence for Hydrographic Surveyors S-5 explained the importance of practical (R . G 1996) lessons and practical training in the Hydrographic Surveyor Training Course (INTERNATIONAL HYDROGRAPHIC ORGANIZATION, 2011) (Balai Pelatihan dan Pendidikan Geospasial, 2019) Course B program as follows: Because hydrographic applied discipline, (Rochon, Eynaud, & de Vernal, 2008) every student is attending Category A and B program is expected to be given hand-on experience by the instructors. This experience should form an important part of student assessment and practical exercise and field training projects. (Levy, 2019) Posavac and Carey explained that the program is a collection of methods, skills and sensitivities that are necessary to be used, whether it is designed or not whether the human service does help people in need. Posavac and Carey view program evaluation as a collection of methods, skills and sensitivity to determine whether a service is needed to meet identified needs (Parson, Childs, & Elzie, 2018) (Moeller & Seehuus, 2019), whether the implementation of services is in accordance with the plan, whether the service helps meet needs. Stufflebeam and Shinkfield confirmed that "evaluation is a collection and analysis of quality information for decision makers". Evaluations according to Stufflebeam and Shinkfield are collection and analysis of quality information for decision makers. Kirkpatrick and Kirkpatrick explained the reason for evaluating the effectiveness of training programs (Gunderman & Chan, 2015) (Noland, Weiner, Klein, & Puniello, 2017). When the evaluation is done, we can hope that the results will be positive and gratifying, both for those who are responsible for the programs and upper-level managers who will make decisions based on their evaluation of the program. Evaluations according to Kirkpatrick and Kirkpatrick were conducted to determine the effectiveness of the training program implementation. Evaluation is done so that the training reaches positive and satisfying results and can be used for decision making. In explaining evaluations it is generally carried out for one or two main reasons; to find areas for improvement and / or to produce an assessment of the overall quality or usually value for reporting and decision making purposes. Owen emphasized the evaluation objects including: a) Policies; b) Programs; c) Products; and individuals.

III. METHODOLOGY/MATERIALS

Based on the results of preliminary observations on the implementation of the Hydroscopic Dikspespa 2011, 2012 and 2013, the location of the Surta Hidros Practice Training was outside the Indonesian Navy's Pusdikhidros (Markas Brsar TNI Angkatan Laut, 2010) and carried out using the Lattek Surta Hidros program simulation and evaluation method using the Kirkpatrick model. The research method is about the problem of work methods, namely the way of working to be able to understand the object that is the target of the study. Evaluation Implementation of the Practice Training Program Surta Hidros is an activity of collecting, processing

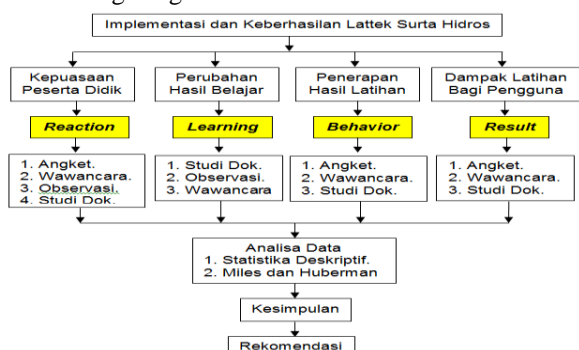
and analyzing data or information about the implementation of Surta Hidros Practice Training to determine the level of satisfaction of students towards organizing training, changing learning outcomes aspects of knowledge and skills, applying training results in work and the impact of training on organizational productivity. The Hydro-Oceanographic Officer School (Sepa Hidros) as the organizer of the Dikspespa Hidros unit, always evaluates the implementation of Lattek Surta Hidros. The practical lesson on Dikspespa Hidros is a teaching and learning activity that supports theoretical learning from one subject where students practice to apply the theory obtained by using certain practice tools according to the subjects. Practice practice is one way to provide knowledge and skills to students to understand certain concepts, principles or skills using simulation methods. The Military Commander's Decree Number: Kep / 304 / XII / 2011 (TNI Angkatan Laut-Komando Pengembangan dan Pendidikan, 2011) concerning the Guidelines for Implementing Practical Practice in the Physical Environment explains the Practice of Surta Hidros including the level III group, namely practical training activities in the learning process. Practice training as a subject used to assess the field of study of Dikspespa Hidros Practice is the Practice of Surta Hidros (Lattek Surta Hidros). For students from outside Pushidrosal (non hidros), Lattek Surta Hidros becomes a means of orientation towards the work that will be faced in the assignment. For students from Pushidrosal (hidros), Lattek Surta Hidros as a means of improving the knowledge and skills gained by students through assignments.

Kirkpatrick's evaluation model, Kirkpatrick in Wexley and Latham states that the effectiveness of a training program can be evaluated (Deborah Wellsa, 2001) (Team, 1993) by the criteria of reaction, learning, behavior and results. Kirkpatrick's model as a model known as The Four Level Technique for Evaluating Training Program consists of: reaction, learning, behavior and result. Evaluation requires an assessment of the program's impact on behavior and attitudes in the short and long term. Measurement of training effectiveness includes assessment: 1. Reaction - how participants feel about the program. 2. Learning - knowledge, expertise, and attitudes obtained as a result of training 3. Behavior - changes that occur in the work as a result of training 4. Results - impact of training on overall organizational effectiveness or achievement on organizational goals. Kirkpatrick's evaluation model is built on four levels of evaluation. Kirkpatrick's evaluation model is a model starting from the first level and then if possible, continuing at the second, third and fourth levels. Information from the previous level is the basis for high-level evaluation. When moving from level one to level four, the evaluation process will be difficult and take more time but the evaluation provides significantly more complete information. Questions to be answered using Kirkpatrick's evaluation model of program implementation can be seen in table 1 below:

Evaluation Level	Questions
1. <i>Reaction</i>	Are participants satisfied with the program?
2. <i>Learning</i>	What did the participants learn from the program?
3. <i>Behavior</i>	Do participants change their behavior based on what they learn?
4. <i>Result</i>	Does behavior change positively affect the organization?

Each level in Kirkpatrick's evaluation model represents a more appropriate measure of effectiveness about implementing an exercise program. Kirkpatrick's evaluation model does not only provide information about the learning outcomes of organizing an exercise program but also provides information about processes, outputs and outcomes. Each evaluation model described above has advantages and disadvantages of each. The evaluation model chosen in the study was the Evaluation of the Implementation of the Surta Hidros Practice Training Program, the Kirkpatrick Evaluation Model. The Kirkpatrick Evaluation Model was chosen because it has advantages namely simple, comprehensive logic flow because it covers cognitive, skill and affective aspects, easy to understand, clear categorization and object of evaluation not only learning outcomes but also includes processes, outputs and outcomes. Kirkpatrick's model can evaluate Lattek Surta Hidros components, improve learning outcomes, apply training results in work, exercise impact on organizational productivity. The weakness of Kirkpatrick's evaluation model is the difficulty in measuring the impact of the implementation of the Surta Hidros Practice Training program on changes in behavior of students and organizations because it is out of reach of the organizing institution. The weakness of Kirkpatrick's evaluation model can be minimized by conducting interviews and document studies on graduates of Pusdikhidros (Pushidrosal) user organizations. The use of Kirkpatrick's evaluation model in this study not only obtained information about how the implementation of the Surta Hidros Practice was carried out by Sepa Hidros but also obtained information from the Pushidrosal especially on the Hydros Survey Unit as users of student or graduate results. The results of the evaluation of each stage illustrate the achievement of the Surta Hidros Practice Training program on educational goals and objectives.

Fig 1. Research Design Evaluation of the Surta Hidros Practice Training Program



Coastline Measurement Boat Sounding Instalation Determining Position of GPSs

Fig 2 . Some activities on Surta Hidros Operation

IV. RESULTS AND FINDINGS

The products produced from the Surta Hidros Operation activities that both maps and marine information have received international recognition since Pushidrosal became an International Hydrographic Organization (IHO) membership. The policy of conducting practical training in Kobangdikal is part of the process of implementing education that is absolutely implemented to achieve goals and objectives of education. The policy is realized through the implementation of practical training programs to provide provisions and increase knowledge, skills and attitudes in order to complete the Dikspespa Hidros. Students have the ability to carry out tasks and jobs in their work units (Pushidrosal). The practice of Surta Hidros as part of the subject area of the Dikspespa Hidros Practice Exercise is a set of activities that are absolutely carried out in a limited time (lesson hours according to the curriculum) in which the training material consists of several specialization subjects contained in the Dikspespa Hidros curriculum and delivered by transfer the experience of the trainer / instructor and directed towards achieving the goals and objectives of the Dikspespa Hidros. The implementation of the Surta Hidros Practice Training as a form of policy implementation of the Navy Chief of Staff and the Military Commander carried out by Pusdikhidros in this case the Hydro-Oceanographic Officer School.. Evaluation of the implementation of the Surta Hidros Practice Training program is an activity of collecting, analyzing and interpreting data on the activities and characteristics of the implementation of the Surta Hidros Practice Training to determine the success of the Surta Hidros Practice Training through the level of student satisfaction with Lattek Surta Hidros, changes in learning outcomes after Lattek Surta Hidros, the application of training results to work and the impact of training on organizational productivity. a. Reaction stage. Kirkpatrick stated that evaluation of the reaction stage is similar to measuring the satisfaction of trainees.

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The more effective the training is, the better the response of participants' satisfaction with the implementation of training. Research variables at the reaction stage to determine the level of satisfaction of students include the design of training materials, trainers and training facilities. The evaluation of the implementation of the Lattek Surta Hidros program was in addition to knowing the level of satisfaction of students based on the Lattek Surta Hidros component as well as to find out the process of implementing Lattek Surta Hidros. b. Learning Phase (Learning). The purpose of evaluating the learning stage measures the level of understanding of participants in the training material whether the participants' knowledge increase after participating in training activities. The practice of Surta Hidros at the learning stage is focused on knowing the success of the implementation of the Surta Hidros Practice Training based on changes in student learning outcomes aspects of knowledge and skills before and after the implementation of the Surta Hidros Practice Training. c. Behavior Stage (Behavior). Kirkpatrick explained that stage 3. Evaluation or behavior stage seeks to find out the application of knowledge, skills and attitudes obtained by participants during the training program in work practices. Practical Practice Surta Hidros provides knowledge and skills on the Hydrographic profession to students. The Surta Hidros Practice Training program evaluation at the behavioral stage was carried out to determine the success of the Surta Hidros Practice Training by obtaining information on whether the knowledge, skills and attitudes of the Surta Hidros Practice Training were really applied by students in their daily work behavior. Measuring the stage of behavior is by knowing the performance of students in supporting Surta Hidros Operational activities through the components of work ability and work motivation. d. Result Stage (Results). Practice of Surta Hidros in Dikspespa Hidros is a means of developing knowledge and skills and attitudes that are absolutely held to prepare students in accordance with the demands of the job. The actual work behavior of students includes knowledge, skills and attitudes needed to complete work. Practical Practice of Surta Hidros on Dikspespa Hidros is one way to provide work skills and work motivation to students. Practice of Surta Hidros on Dikspespa Hidros aims to develop certain behaviors of students to fulfill the demands of work tasks so that students can function optimally in their work environment. Practical Practice of Surta Hidros on Dikspespa Hidros is a series that cannot be separated and is absolutely held for the achievement of the goals and objectives of the Dissertation of Hidros. Practice of Surta Hidros in Dikspespa Hidros is an activity that teaches students about the work of Surta Hidros operations starting from the preparation, planning, implementation and reporting stages.



Fig 2. Products from Surta Hidros Operational Activities

V. CONCLUSION

This study concludes that it is necessary to evaluate the practice of the Surta Hidros practice program in general to determine the achievement of the implementation of the practice of the Surta Hidros as a means of developing knowledge and skills for the achievement of the goals and objectives of the Dissertation Hidros and to know the quality of the implementation of the Surta Hidros Practice.

ACKNOWLEDGEMENTS

Sulfikar Sallu ID Scopus 57200989289 doctoral students of Education Technology, Universitas Negeri Jakarta, and Lecturer at the Faculty of Information Technology, Universitas Sembilanbelas November, Kolaka Sulawesi Tenggara Indonesia.

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Author Profile

I am **Kukuh Suryo Widodo**, currently I am affiliated with Manajemen Pendidikan/ Universitas Negeri Jakarta, Indonesia, ksuryowidodo@yahoo.com

I am **Bedjo Sujanto**, currently I am affiliated with Manajemen Pendidikan/ Universitas Negeri Jakarta, Indonesia

I am **Mukhneri Mukhtar**, currently I am affiliated with Manajemen Pendidikan/ Universitas Negeri Jakarta, Indonesia