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Keywords: *soft skills, learning model, kkni, technology vocational school.*

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Development of Instructional Model based on Indonesian National Qualification Framework to Improve Soft Skills Students in Vocational Technology

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Abstract- This study aims to develop a learning model based on the framework of Indonesia's national qualifications in an effort to improve students' vocational high school soft skills in North Sumatra Province. To produce operational products, namely the Indonesian National Qualification Framework (KKNI) based learning model, a cycle of research and development was carried out known as "the R & D cycle" which was carried out in stages over a period of three years. Quasi-experimental method with the design of "Pretest-Posttest Control Group" was conducted in order to draw the effect of learning model developped and used t- test to determine effectiveness of the learning model developped. As the result of this study are that the students achievements about soft skills in experimental class (Mean= 83.7) is found higher than that with control class (Mean =73.5),where both are significantly different. As a whole, the results showed that the performance of instructional model developed more effective to improve soft skills of students' vocational high school.

Keywords: soft skills, learning model, kkni, technology vocational school.

I. Introduction

Conceptually, competency-based curricula can be recognized as one of the means for implementing teaching and learning processes in the classroom to provide and broaden students' insights about knowledge, skills and other basic values in the hope that they can be reflected in the habits of thinking and acting. However, students have a very strong dependence on how they are treated by educators. That is, the success of students / students mastering competencies (learning outcomes) with regard to how lecturers / teachers practice learning systems in the implementation of learning.

The main problem in conceptually based Indonesian National Qualification Framework (KKNI) is how to relevance competencies (learning outcomes) with the framework of Indonesia's national qualifications contained in the planning and readiness of teachers / lecturers to manage their learning in order to achieve the desired competencies in students effectively , efficient, and interesting. Graduates' competencies for all educational institutions are related to *hard skills* and *soft skills*. In this regard, in general, education today is more about the development of hard skills (90%) than the development of *soft skills* that are only 10% [1]. In fact, the results of research in Europe show that a person's success in the business world is 80% determined by his *soft skills*and only 20% is determined by his *hard skills*.. This means that they prioritize *soft skills* rather than *hard skills for* graduates of educational institutions. The survey findings are in line with the opinion of Bergh, et al.[2] which states that the human resources (HR) that will be able to exist in the 21st century are those who have *soft skills* strong, in the form of the ability to think creatively, productively, make decisions, solve problems, learn how to learn, collaborate, and self-management.

Workers often complain that workers from educational institutions who do not have good soft skills generally cannot stand the world of work, are not honest, get bored quickly, cannot work together, and cannot communicate verbally or write reports with good [3]., various survey results also show that in recruiting workers almost all companies prioritize *soft skills* applicants'rather than their *hard skills* [4].

From the description above, it can be concluded that reliable graduates from educational institutions expected by the business / industry are graduates who have high *soft skills* . If these reliable graduates are specified as graduates of Vocational High School (SMK), it means that the teaching staff (teachers) in Vocational Schools are required to first understand and have *soft skills* as expected by the business / industry to then form and / or develop them in their students through teaching and learning strategies. The logical consequence is that all Educational Teaching Institutions (LPTKs), including the UNIMED Faculty of Engineering's Mechanical Engineering Education Study Program, which will produce prospective teaching staff

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at Vocational Schools must also be able to form and develop these *soft skills* to their students as long as they attend college on campus. For this reason, the need for teachers / lecturers to design learning that can shape and develop *soft skills* that are clear and systematic, through needs analysis and developed by accommodating the demands of various stakeholders, and getting full support and commitment from all teaching staff (lecturers / teachers) in their implementation.

The implementation of the competency-based curriculum has been started in Vocational Schools since the 2006 school year. However, based on the results of the questionnaire given to students about the achievements of the *soft skills* designed in the learning implementation plan it turns out that it has not been in line with the target. Based on the survey of the practical learning process there were several problems. First, most students do not have the willingness to do the best and the standard or prioritize perfection, there is a tendency to just fulfill the task. Second, lack of systematic, well-coordinated work habits that reflect efficient and effective work. Third, lack of work independence, there is a tendency towards dependence on friends and teachers so that there are often process errors or products. Fourth, lack of initiative or creative ideas when encountering problems in the process or product, so the results are not optimal [5].

These problems are due to the learning pattern so far emphasizing the mastery of *hard skills* and giving less portion to the efforts to develop *soft skills* so that they are side by side with *hard skills*.

This is thought to be caused by the learning strategies implemented not relevant to the characteristics of the field of study and the characteristics of students, as stated by Reigeluth [6] that results that are effective, efficient and interesting are determined by the suitability of learning strategies with the characteristics of the study area and participants. Effective learning strategies are closely related to learning models. Kauchak and Eggen [7] suggest that learning strategies are wrapped by learning models. Therefore, the assessment of learning strategies requires an assessment of the learning model. That is why the focus of the problems in this study were examined from the aspect of the learning model. The field of study or field of expertise in this study is limited to the field of design and construction, namely the design of metal splicing concentration machine elements.

The main problem in conceptual learning of vocational technology competencies is how to relevance learning outcomes with the Indonesian National Qualifications Framework contained in the planning and readiness of teachers to manage their learning in order to achieve the desired competencies in students, effectively, efficiently, and attractively, especially in field of welding technology. Achievement of learning outcomes is determined by the learning model applied. Therefore, the focus of the problem in this study is the development of an IQF-based learning model that can improve students' soft skills.

In this regard, the formulation of the problem in this study is:

How is the effectiveness of the Indonesian national qualification framework (KKNI) based learning model developed in an effort to improve students' soft skills?

II. Literature Review

From the report SCANS identifies 5 (five) competencies and 3 (three) basic parts of a person's skills and qualities to be able to handle work, namely: *The five competencies*: (a*) resources: identifies, plans, and allocates resources; (b) interpersonal: works well with others; (c) information: acquires and uses information; (d) systems: understands complex interrelationships; (e) technology: works with a variety of technologies. The three-part foundation consists of: (a) basic skills: reads, writes, performs arithmetic and mathematical operations, listens, and speaks effectively; (b) thinking skills: thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons; (c) personal qualities: display responsibilities, self-esteem, sociability, self-management, integrity, and honesty.*

Competence is a basic characteristic that consists of skills, knowledge and other personal attributes (*soft skills*) that are able to distinguish a person from *performing* and not *performing.* Spencer & Spencer [10] classifies competencies as basic characteristics, causal relationships and reference criteria as follows: 1) Basic characteristics are competence as part of an individual's personality and can predict behavior in situations and tasks, namely: a) motives as encouragement from self someone consistently to take an action; b) nature / character, namely physical characteristics and consistent responses to situations or certain information; c) self-concept, namely the values of attitudes or self-image possessed by individuals; d) knowledge, namely information that someone has for a particular field; and e) skills, namely the ability to carry out tasks physically or mentally. 2). Causal relationships are competencies that cause and predict behavior and performance. Motive competency, character / self-concept can predict behavioral actions that can ultimately predict performance results. 3). Reference criteria are the most critical competencies that can distinguish competencies with high or average performance. Thus vocational competence is a manifestation of one's abilities and skills to carry out overall vocational tasks in accordance with the expected standards in a real work environment.

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Soft skills are non-technical competencies that point to personality characteristics. This can be seen in a person's behavior, both when interacting in social situations, language skills, personal habits, or important traits to support optimistic behavior. Based on this, it can be said that *soft skills* are the strength of oneself to change or to overcome various work problems. Mastery *soft skills* of students'is the essence of competence that must be mastered and measured through performance during learning. Learning *soft skills is* seen as part of the effort to form a professional attitude. This attitude will influence behavior caring for quality, fast, right, and efficient, respecting time and reputation (Djoyonegoro, 1998). The attitude formation must be carried out from the beginning through the process of habituation to work that is developed and harmonized with learning needs.

Wagner [11] emphasizes seven *survival skills* that have important values in this 21st century era. When examined, *skills* theseare *soft skills,* namely: (1) critical thinking and problem solving, 2) collaboration through networks and leading with influence, (3) agile and able to adapt, 4) initiative and entrepreneurship, (5) effective communication both written and unwritten, (6) accessing and analyzing information; and (7) imagination and imagination. Thus, mastery of *soft skills is* important so that graduates are able to survive various work challenges.

Soft skills can be observed through performance such as speaking ability that reflects ideas and information, or clearly explains a topic, is easy to understand topics that are unknown, able to interact and work cooperatively in groups. A person with high mastery of *soft skills* will reflect abilities that exceed the capacity as a workforce. This ability arises because the person concerned is independently able to move internal processes to continue learning, trying and finding something that benefits his work or for self-development. Thus *soft skills are* important to master because they are needed by someone to develop themselves in doing work.

Learning is *Soft skills* packaged using an integration model with some ease of consideration. This means that the implementation of learning follows thelearning pattern *hard skills* implemented in accordance with the applicable curriculum implementation, does not require special funding and is more useful for strengthening *hard skills*.learning of *softs skills* Integratedis implemented with aapproach *connected model*, and *nested models* [12]

The integration of *connected models* emphasizes the relationship between *soft skills* and *hard skills* on every topic, concept, skill, and with the world of work today and in the future. *Nested models are* oriented towards achieving *multiple skills* and *multiple targets*. With this model, learning *soft skills* will be easily achieved because *soft skills* integratedare not forced. Every learning activity in it already has *soft skills* that are measured through learning targets.

Richey [13] defines the model as an illustration that results from the fact that it has an arrangement of a certain sequence. According to him the model can be used to organize knowledge from various sources then used as a stimulus to develop hypotheses and construct theories into concrete terms / conditions to apply them to practice or test theories.

Gustafson and Branch [14] which emphasizes the practical function of a model that is a means to facilitate communication, or regular instructions (algorithms) that are prescriptive in order to make decisions, or planning instructions for management activities. Furthermore, it is said that a good model is a model that can help the user to understand what the overall process is fundamentally. The basis of a good model is the connection of several theories. Thus, it can be said that the benefits of the model for the user include: (1) explaining several aspects of human behavior and interaction, (2) integrating what is known through observation and research, (3) simplifying complex humanitarian processes, (4) guidelines to carry out activities.

In relation to learning, the learning model serves to direct educators to design learning that is used as a guide in the implementation of learning in order to achieve effective, efficient, attractive, and humanistic learning. Joice [15] explains the learning model is a plan or a pattern that is used as a guide in planning classroom learning or learning in tutorials and for determining learning tools and directing us to design learning to help learning participants so that learning objectives are achieved.

Kaufman and English [16] distinguish 3 (three) types of development models to determine which ones are appropriate and appropriate to use, namely: (1) inductive models, which depart from students' current behavioral experiences, then grouped, compared, developed and finally evaluated for revisions, (2) deductive models, beginning with determining general goals, determining criteria, finding links between existing / partner elements, collecting data, formulating specific objectives, developing and implementing, then evaluating and revising , (3) classic models, starting with some general requirements of objectives, program development, program implementation, then evaluated and revised.

The University Consortium for Instructional Development and Technology (UCIDT) presents a model that can be applied to the development of learning [17] The model includes 3 (three) stages: definition, development, and evaluation, divided into 9 (nine) with each of the 3 (three) steps and are interrelated with each other, namely:

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Level I: Defining, including 1) Identifying the problem. In this first step what is done is identifying the problem, namely the gap between what is expected and the one that exists. More specifically, determine the conditions, what and what should be achieved by students, 2) The second step is the analysis of the situation, namely in an environment such as what learning is carried out, including students, learners (teachers), managers, and sources or materials learning, 3) The third step is organizing management, namely the executive leader who is responsible and carries out communication and other authorities.

Level II: Development, including 4) identification of objectives, as part of the development stage of learning begins with identifying specific learning objectives, if achieved, then the problem in the first step will be solved. In the formulation of goals must be stated: who are the participants or students *(Audiences)*, behavior *(Behavior)* what can be done after the program is completed, under conditions *(Condition)* what they are formed, and level *(Degree) of* expertise achieved, 5) selection special methods or learning methods used to achieve goals, 6) constructing blueprints or *prototypes*, namely the components used, such as teaching preparation, exam materials, and specific guidelines and program evaluation.

Level III: Evaluate, copy 7) test the *prototype*. The evaluation phase begins by testing each component of the program. This initial trial was conducted on small samples and observations were held to see the presentation. Student comments are used as an assessment of what they are achieving, 8) analysis of results. The data collected in step seven determines the significance of the extent of the contribution given by each component to achieving goals, useful or not, 9) implementation / revision. Program improvement is done by looking at the achievement of certain goals, by reevaluating the contribution of learning components to achieving goals.

Regarding the product design model, there are five learning design models identified. The five models are (1) Kemp (1977), (2) Banathy (1978), (3) Calvano (1980), (4) Paul Harmon (1982) and (5) Dick & Carey Models (2005).) Of the five models, the learning design model from Dick, Carey & Carey [18] was chosen to be used in this study.

III. Research Methods

This research uses development research methods. Conducted directly with descriptive data collection that processes and analyzes inductive data. To produce operational products, namely the KKNI-based learning model for the improvement of *soft skiils* effective, efficient and interesting student, a cycle of research and development is known as "*the R & D cycle*" by Borg & Gall, combined with a design model learning from Dick, Carey and Carey.

In this study, survey methods were used through needs analysis, trial methods through procedures (a) expert review, (b) one-on-one trials, (c) small group trials, and (d) limited scale field group trials, and (e) trials of large-scale field groups to produce operational products.

Implementation of large group trials (field trials) using quasi-experimental methods with the design of "*Pretest-Posttest Control Group Design*".

The population of this study were all students of the State Vocational School in the Field of Welding Technology in North Sumatra Province. The subjects of this study consisted of students from the State Vocational School of Welding Technology, each one from two cities and five regencies. This sampling uses a simple random technique.

Data collection techniques used in this study were questionnaire techniques and interview techniques, as well as documentation techniques to capture data on needs analysis activities, questionnaire techniques to capture data about riviuwer responses and students on expert validation activities and one-on-one trials and group trials. small, and test techniques and observations on limited field testing activities as well as large-scale field trials.

The data analysis techniques used are (1) descriptive analysis to describe the data from the results of needs analysis and expert validation and one-on-one and small group trials. (2) t- test to find out the difference of model effectiveness for limited scale field testing.

IV. Research Results

Based on the results of the analysis of the literature study, 10 soft skills were obtained which needed to be possessed by professional workers, namely 1) communication skills, 2) computer and technical literacy, 3) interpersonal skills, 4) adaptability, 5) research skills, 6) project management skills, 7) problem-solving skills, 8) process improvement expertise, 9) strong work ethics, and 10) emotional intelligence.

Based on the results of the needs analysis found six soft skills that must be owned by workers, namely 1) communication skills, 2) team work and collaboration, 3) adabtability, 4) problem solving, 5) critical observation, and 6) conflict resolution.

Based on the results of curriculum analysis of vocational technology (K13) found seven soft skills that must be possessed by graduates, namely 1) creative, 2) productive, 3) critical, 4) independent, 5) collaborative, 6) communicative, and 7) solutions.

Based on the results of learning analysis found the skills competency map (*hard skills*) as follows.

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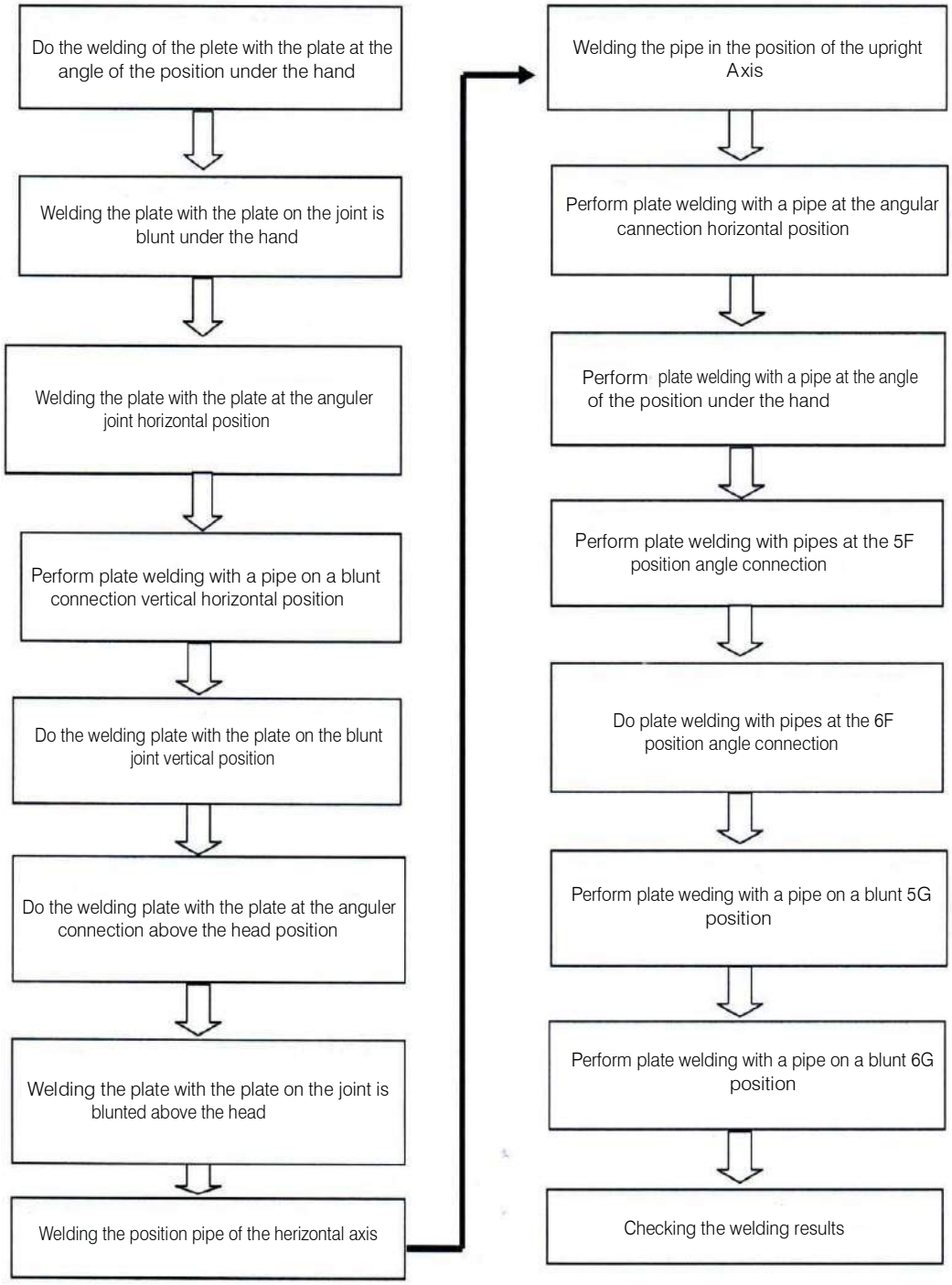


Figure 1: Welding Skills Competency Map

Draft learning model based on the analysis of the results of the literature study and competency characteristics and characteristics of the field of study which in the process raises the soft skills that have been identified based on needs analysis as follows.

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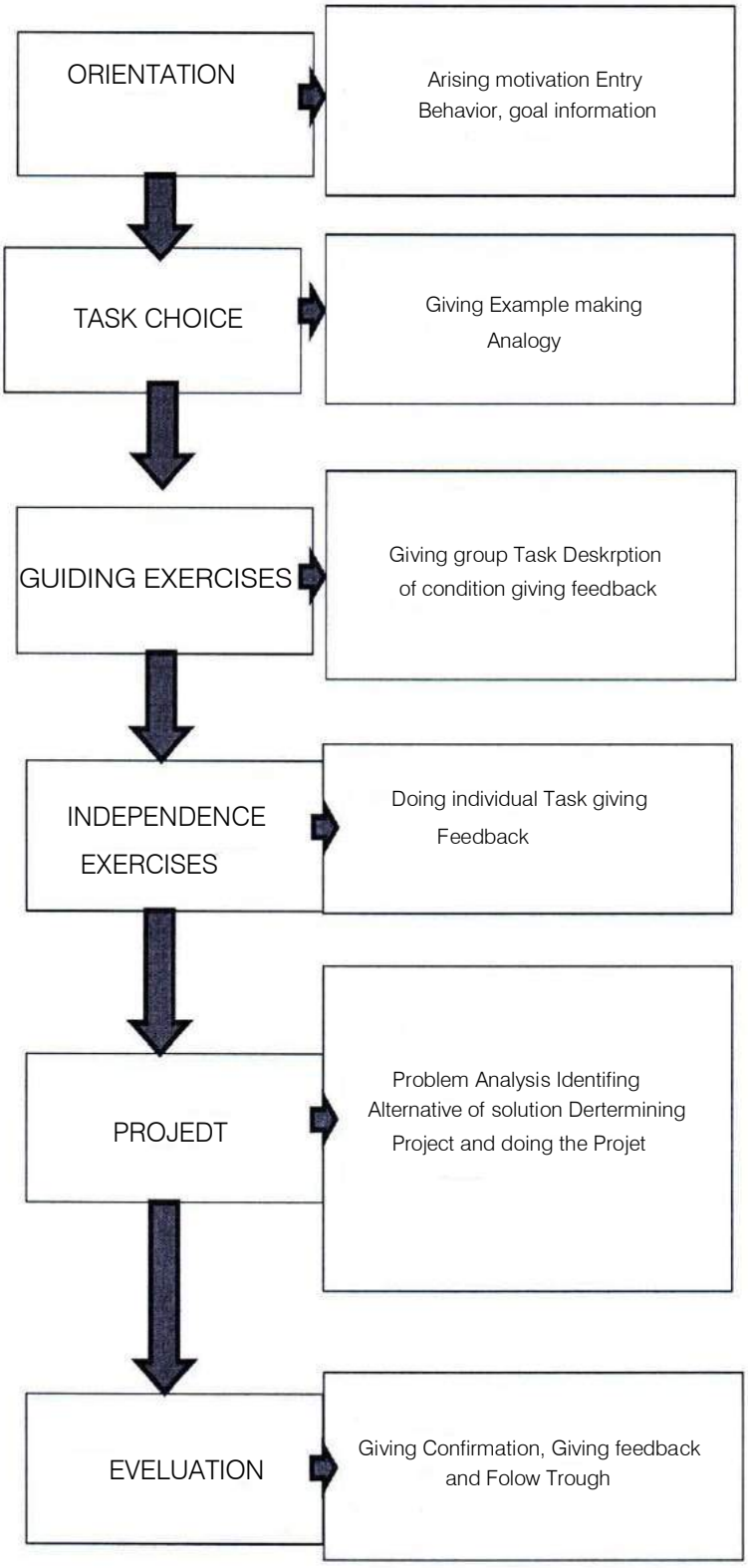


Figure 2: Draft Welding Engineering Learning Model Based on KKNI to Improve Soft Skills

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The KKNI-based welding technique learning model to improve soft skills as shown in Figure 2 above is still the initial model that will be continued through testing or through formative and summative evaluation as consistency of the application of the Dick, Carey and Carey (2005) models, consisting of six main steps , namely: 1) Orientation, including activities to build motivation, review the initial ability to explain objectives, 2) Select tasks, include activity description of conditions and analogies, 3) Guided exercises, including activities to provide examples, Group assignments, and Feedback, 4) Individual exercise, covering individual task activities and feedback, 5) Projects, including problem analysis activities, alternative solutions, determining projects, completing projects, and 6) confirmation (testing), feedback, and follow-up.

As a result of the second year research found that: (1) the quality of instructional model viewed from the expert in educational technologies is *good (*76.00%), (2) in the one to one try out indicated that the product is *good (75.46*%), (3) in the small group try out indicated that the product is *good* (87.04%), (4) and in the field try out indicated that the product is very *good* (mean = 83, 7). Students achievements about soft skills in experimental class (Mean= 83.7) is found higher than that with control class (Mean =73.5),where both are significantly different. As awhole, the results showed that the performance of developed instructional model more effective to improve soft skills of students' vocational high school.

V. Discussion

Based on the results of the design expert, media expert and material expert as well as student assessment results, this model is appropriate to be used to improve soft skills. The result of this second year research shows that the Learning Model of Welding Engineering Based on KKNI which was developed more effective than the learning model that is usually done. This is because the model has been built through theoretical studies of learning models that are thought to be able to foster personal competence, thinking skills, social competence, and vocational competence, as adapted from the learning models presented by Joyce, Weil, and Calhoun (2009), as well as Kauchak and Eggen (2012).

The learning model is also based on the characteristics of the field of study / expertise and characteristics of students. Reigeluth (1996) suggests that if the learning method is adapted to the conditions of learning it will produce effective, efficient, and attractive results. This is also supported by Nadler (1988) explaining that a good model is a model that can help the user to understand the execution process.

Furthermore, it is said that the basis of a good model is the relation of several theories. Because the building of the learning model has been based on the interrelationship between several theories, that is why this developped model effective, efficient and attractive. Furthermore, the developed model will be tested again on a wide scale to produce operational products.

VI. Conclusions

The KKNI-based welding technique learning model to improve the *soft skills* that have been produced as the main product has six main components1) Orientation, including motivation building activities, reviewing the initial ability to explain goals, 2) Choosing assignments, including activity description conditions and analogies , 3) Guided training, including activities to provide Examples, Group Tasks, and Feedback, 4) Independent training, covering individual task activities and feedback, and 5) Projects, including problem analysis activities, alternative solutions, determining projects, completing projects, and 6) Evaluation includes confirmation activities, feedback, and follow-up.

The Learning Model of Welding Engineering Based on KKNI which was developed appropriate to be used to improve soft skills and more effective than the learning model that is usually done. Furthermore, the developed model will be tested again on a wide scale to produce operational products.

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