

Development of Instructional Design *Comprehensive Performance Improvement Based on Seamless Learning (CPISL) Model in Vocational College*

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ABSTRACT

This research develops the instructional design Comprehensive Performance Improvement based on Seamless Learning (CPISL) in improving student competency in Vocational College. The subjects of this research were 59 respondents consisting of vocational College lecturers and experts of instructional design in Vocational College. Data collection was conducted through questionnaires about the assessment of CPISL instructional design model, which was made offline and online also interview to 5 respondents as the representative. This research uses the research and development process from Borg and Gall with small scale that is from 1st stage till the 7th stage, which by revising the main product. The result of this research that are name of CPISL become CPSL and also it lead into 2 products that are: CPSL Instructional Design Model and CPSL Instructional Design Model Book for Vocational Education that already got Intellectual Property Rights (HaKI) inside Creation Registrations Letter number EC00201824980, with registration number 00011537.

Keywords: CPSL model's, seamless learning, vocational, HaKI

INTRODUCTION

Vocational education in Indonesia implements a competency-based curriculum in accordance with Minister of National Education Decree Number 232 / U / 2000, but in its implementation, the level of compatibility between the competencies given in vocational schools with those needed by the industrial world is around 60% for large industries, so there is a gap of around 40%, while in entrepreneurial activities the gap is around 20%. ^[1] So, vocational education needs to shift the focus of learning from theory to apply. ^[2] Vocational College prepare graduates to be ready to work in certain positions, so in addition to professional knowledge and skills, vocational College graduates are also

expected to have soft skills, namely creativity, problem solving, communication, working in teams and entrepreneurship. These skills make workers able to socialize and work together with their colleagues, maintain their ability to work and lead to the ability to survive when facing change, so that the elements of vocational Colleges' learning outcomes in Graduate Skills Standards consist of: Attitudes, Knowledge, General skills and Special skills. ^[3]

The results of the research in Naval Academy is one of the vocational College, concluded that learning aspects of knowledge, skills and character must be implemented in an integrated manner. ^[4] Integrated learning aims to make learning more comprehensive based on a holistic

learning paradigm. The characteristics of integrated learning are: holistic, oriented to students, process oriented, meaningful learning experiences, authentic, evaluation of processes and products. [5,6]

The other results of the research on the development of character-based educational pattern models at Naval Academy show that character-based education is carried out with continuous processes ranging from moral knowing, moral feeling, and moral behavior so that character is formed, besides that education is not only formally given by lecturers, but also in a non-formal manner by families, leaders, seniors, caregivers, so that education can be carried out in various places, with various learning media. [7] This is relevant to the concept of seamless learning, from several studies [8-23] which can be concluded that seamless learning is interrelated learning becomes a complete and continuous display, both formally, non-formal and in formal. Learning can be accessed everywhere, using technology and internet networks / mobile learning, by utilizing existing learning resources both designed and utilized, including using students' life experiences to give meaning to the material taught in class. The point is how students can continue to experience learning in different contexts. Wong identified 10 dimensions of seamless learning: (1) Encompassing formal and informal learning (2). Encompassing personalized and social learning (3). Across time (4). Across locations (5). Ubiquitous knowledge access (6) Encompassing physical and digital worlds (7). Combined use of multiple device types (8). Seamless switching between multiple learning tasks (9). Knowledge synthesis (10). Encompassing multiple pedagogical or learning activity models. [23]

Vocational education is a higher education system that is directed at mastering certain skills, [24] so it is very important to develop learning design that focuses on graduate competencies as ready for use candidates, namely learning design

that begins with analysis of competencies expected by the users of these graduates, a kind, similar to the learning performance improvement (PI) design model that Frank D. Patton has used in training his employees. [25] The fundamental difference in employee training with Education in Vocational Education is that vocational universities' education is more complex because competency in shaping professionalism starts from the basics, with 1 to 4 years of education, the use of learning designs other than PI, must also pay attention to the Dick and Carrey's system approach instructional design. [26]

Instructional design according to [26-28] can be concluded that learning design is the science and art of creating processes systematically in the development of learning materials, learning processes, and evaluations to achieve learning objectives obtained by analyzing student learning needs based on the principles of learning.

The Instructional design model of the Comprehensive Performance Improvement (CPI) originally from Daterline and Rosenberg (1992) was later adopted by the International Society for Performance Improvement (ISPI). Next are Rita C. Richey, James D. Klein, and Monica W. Tracey, using a systematic approach to overcome opportunities and work problems, with underlying theories namely psychology, system theory, organizational development, instructional system design and communication theory. [29]

Based on the above and relevant supporting theories, This research discuss issues regarding, How to develop instructional design model that suit to be used on formation of student's competence in vocational university until the graduates become workers which ready for use when in the first job based on own department?

MATERIALS & METHODS

Research and development design

This study uses research and development methods which procedures use references from Borg and Gall. [30,31] This

study uses R & D on a small scale with 7 stages, namely: 1) To review the relevant literature on textbook; 2) to plan; 3) to develop a preliminary; 4) to field-test the preliminary, 5) the revise the preliminary based on field-test result, 6) to conduct a main field-test of the revised and 7) Revising the main products, while stage 8) Conducting operational field tests; 9) Make improvements to the final product, 10) Disseminate and implement products, and product dissemination, have not been implemented. The initial product of this study was the CPISL Instructional Design Model, which was tested with the assessment of instructional design experts, while the main product was the CPISL Instructional Design Book for Vocational Education, tested by lecturers and instructional design experts, using offline and online questionnaires. The purpose of this research and development is the Creation of the Development of the Instructional CPISL Design Model in the Formation of Student Competence in Vocation College.

Research subject

The subjects of this research were 59 Vocational lecturers and instructional design experts, namely 19 people filling out questionnaires online and 40 people offline. Forty respondents who filled in offline consisted of a Naval Academy (AAL) of 10 lecturers, 5 people from Air Force Academy (AAU), 5 people from Military Academy (Aknil), 5 people from Police Academy (Akpil), 5 people from Naval Technical High School (STTAL), another 5 people from Surabaya Aviation Polytechnic (Poltekbang), and the last 5 people are from Surabaya State Polytechnic (PENS).

Research procedures

Stage 1) Preliminary research was conducted at the Naval Academy (one of the Vocational Universities) namely the Development of Character Based Education Patterns Model in AAL [7] and Contributions of various input variables on process quality and AAL output [4] and review relevant

literature. Stage 2) planning All research activities in a time schedule. Stage 3) initial product development in the form of a CPISL instructional design model. Stage 4) The initial product field trial, carried out by asking for an assessment and testing of the design model image to the instructional design expert. Stage 5) the initial product revision is conducted based on the results of assessment and testing from instructional design experts, then making the main product in the form of a CPISL Model instructional design book and the book is registered to the Intellectual Property Rights (HaKI). Stage 6) The revised main product field trial, carried out by testing the CPISL Instructional Design Model booklet and questionnaire (offline) on the assessment of the model, to 40 respondents and online questionnaires filled by 19 responses. Stage 7) Revise the main product. The CPISL Instructional Design Model book was revised based on the results of field trials.

Research Instrument

The research instruments were offline questionnaires, interview guidelines, and questionnaires which were made online with Google Form with the link <https://goo.gl/forms/Kyz3xF210fMaMpUR2>, there were 19 respondents who filled out this online questionnaire, whose data were analyzed for validity and reliability using SPSS.

Analysis

This research uses research and development methods from Borg and Gall. At the stage of the initial product field trial using the Delphi Method, which is the process in the initial product analysis which involves interaction between researchers and instructional design experts through and assistance with assessment forms. [32,33] In testing the main product produces qualitative data whose analytical techniques are divided according to the category which then be percented to obtain conclusions. [34] The formula used in the percentage is as follows:

$$P = \frac{f}{N} \times 100\%$$

Information:

P = Percentage

f = Amount of frequency of respondent's answer to a choice

N = Number of respondents.

Table 1. Percentage Classification

No	Percentage	Classification
1	76-100%	Good
2	56-75%	Good enough
3	40-55%	Poor
4	>.40%	Not good

Source: [34]

The classification of interpretation of the results of the percentage analysis is like table 1 below:

RESULT

The result initial product of the CPISL learning design model, as in Figure 1

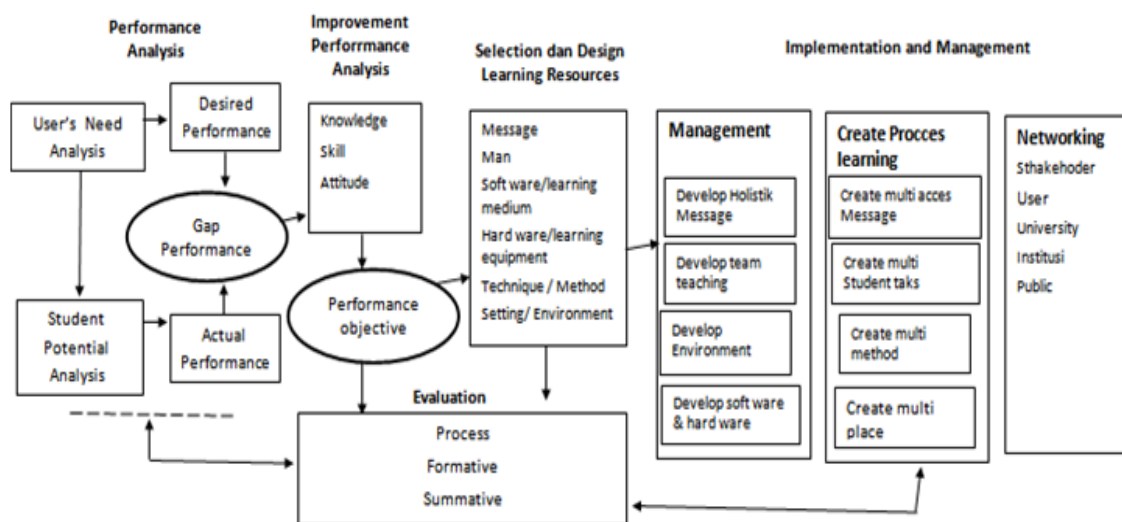


Figure: 1

Instructional Design Model Comprehensive Performance Improvement based on Seamless Learning (CPISL)

The results of the Delphi Method from the assessment form and interview with the instructional design expert team consisting of supervisors and lecturers from the majors in learning technology, obtained the results: 1) preliminary research and theories underlying the development of Seamless Learning-based Comprehensive Performance improvement instructional design models (CPISL) is appropriate 2) the syntax of Seamless Learning-based Comprehensive Performance improvement model instructional design has been systematic, simple and easy to implement, 3) stage 1, Performance Analysis; steps are systematic, precise and easy to do, 4) stage 2, Improvement Performance Analysis; the steps are less systematic, and the drawing diagram needs to be simplified. 5) stage 3,

Selection and Design Learning Resources; steps are right and easy to work on, 6) stage 4, Implementation and change Management; steps are precise but less systematic, especially the images must be simplified. 7) stage 5, evaluation, the steps are systematic, precise and easy to do. 7) Design Instructional CPISL's name was changed to Design instructional CPSL.

Based on these results, the instructional design model was revised and re-discussed with the expert team, and the final results of the CPISL instructional design model changed to the Seamless Learning-based Comprehensive Performance (CPSL) instructional model design, so the final instructional design results of the CPSL model are shown in Figure 2 below.

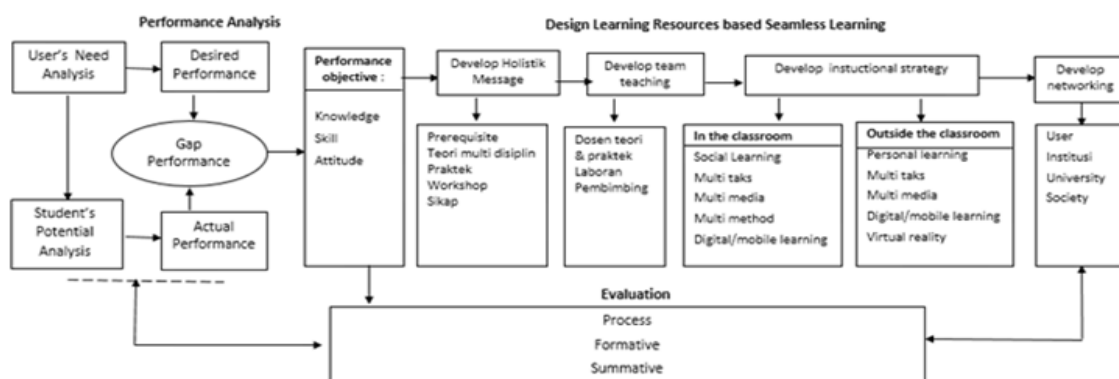


Figure: 2

Instructional Design Model Comprehensive Performance based on Seamless Learning (CPISL)

Based on the revised CPSL Instructional design model such as Figure 2, then the CPSL Model Design Learning Book for Vocational Education, Practical Theory and Application is compiled with the following syntax:

a. Performance Analysis, done by several steps which are :

- 1) User's Need Analysis, that is analyzing the abilities that being expect by graduate users (cooperation / job field provider) toward a profession of vocational college graduates, which being formulated inside desired performance
- 2) Student's Potential Analysis, that is analyzing the potential that has been owned by the student, which can be seen from data values that exist or even can be seen by giving a test for testing initial abilities and the result formulated on actual performance.
- 3) Comparison of desired performance and actual performance bring up a gap performance, that is ability gap that has been owned by student with abilities that being expect by graduate users.

b. Performance Objective

From this gap performance will be used as a guideline to determine performance objectives in which determine the abilities that being instructional purpose, in the form of knowledge, skills and attitude which have to be teach to student in order be able to reach abilities that being expect by

graduates users, which will be formulated on Learning Outcomes

c. Design Learning Resources based Seamless Learning.

Design Learning Resources based Seamless Learning is designing learning resources which include subject matter, lecturers, education staff, students, learning media, equipment, methods and strategies also learning environments based on seamless learning. Several steps on 3rd stage include:

- 1) Develop Holistic Message, develop comprehensive subject matter including: Prerequisite (prerequisite material), interdisciplinary multi-disciplinary theory, Practice related to one material, Workshop which is the application of various related material, and also Attitude.
- 2) Develop teaching team, develop a team of lecturers consisting of theoretical lecturers, practice lecturers, laboratory staff and mentors.
- 3) Develop instructional strategy, Develop instructional strategy that being implemented inside the class and outside the class.

Inside the class, instructional inside the classroom by: 1) Social Learning (2) Multiple tasks, providing various forms of assignments to improve student understanding, (3) multimedia, (4) multi method, (5) digital / mobile learning.

Outside the class, instructional outside the classroom by: 1) Personal learning, that is

learning which optimized for the needs of each student; this learning is based on their interests and is often initiated by the students themselves. (2) Multiple tasks (3) multimedia, (4) digital / mobile learning (5) Virtual Reality (VR) that is use technology which makes users interact with the environment through cyberspace usually in the form of simulators.

4) Develop networking, build networks with users, relevant institutions, other universities and the Society, thus opening up many networks that will open up more opportunities to enter job field.

d. Evaluation.

Evaluation is carried out in the form of:

- 1) Process evaluation, that is evaluation which has done during instructional process through worksheets and observation sheets,
- 2) Formative evaluation, which is an evaluation that being carried out at each the end of one chapter of material delivery (post test), and
- 3) Summative evaluation, which is an evaluation that being carried out at the end of all material in one course in the form of UTS and UAS

Results of analysis Data obtained from the distribution of books and questionnaires both offline and online. From the online questionnaire filled by 19

respondents, it was used for validity analysis and reliability of the questionnaire, using the Cronbach's Alpha coefficient (reliability test with SPSS). The result is from 50 questionnaire questions, there are 14 valid questions, namely those that have r count value > r table (0.4555) with significance level 0.05, then only questionnaire items that are valid, invalid ones are deleted. Fourteen valid, among other : 1) number 2 with a value of r count = 0,523, 2) number 4 with a value of r count = 0,707, 3) number 5 with a value of r count = 0,517, 4) number 6 with a value of r count = 0,467, 5) number 17 with a value of r count = 0,488, 6) number 19 with a value of r count = 0,539, 7) number 36 with a value of r count = 0,455, 8) number 39 with a value of r count = 0,550, 9) number 40 with a value of r count = 0,700, 10) number 41 with a value of r count = 0,663, 11) number 42 with a value of r count = 0,612, 12) number 46 with a value of r count = 0,644, 13) number 47 with a value of r count = 0,647, 14) number 50 with a value of r count = 0,544. Cronbach's alpha value is 0.876 with significance level 0.05 so it can be concluded that the questioner's reliability level is very high. Data recapitulation results as in Table 2.

Table 2. Recapitulation of Questioner Results from field trials

No	Component	Yes	Some	No	Information
2	Are professional competencies related to job description / work instructions / standart of employees' competencies?	90%	5%	5%	Good
4	Does the analysis of student potential describe the real abilities students have?	49%	51%		Poor
5	Are user requirements compared to students' real abilities will arise competency gaps?	66%	29%	5%	Good enough
6	Does the competency gap relate to determining the knowledge, skills and attitudes that will be given to students?	80%	20%		Good
17	Is teaching with a lecturer team consisting of lecturers of theory and practice, laboratory staff and mentors, the results will be more optimal?	90%	10%		Good
19	Is it appropriate if social learning is applied inside the class?	20%	75%	5%	Not good
36	Is it appropriate that fomative evaluation is carried out at the end of one chapter of learning material with the aim of assessing the success of learning in each chapter?	61%	25%	14%	Good enough
39	Is the instructional design of the CPSL model optimal in shaping the competence of Vocational Universities' graduates?	85%	15%		Good
40	Is there a match between graduate competencies that students will provide with the competencies expected by the user?	85%	15%		Good
41	Is the systematic process of the emergence of factors of knowledge, skills and attitudes that will be provided to students in an integrated manner in determining the goals / objectives of graduate learning?	85%	15%		Good
42	Is it appropriate to develop learning strategies with grouping to learning inside the class and outside the class?	75%	20%	5%	Good enough
46	Is the CPSL model instructional design stage simple?	61%	36%	3%	Good enough
47	Is it easy to apply the CPSL model instructional design?	61%	31%	8%	Good enough
50	Is there any desire You have to refer the CPISL model's instructional design to others?	72%	25%	3%	Good enough

Open questioner result from the respondents were concluded

- a. 95% of respondents stated that the stages in the instructional design CPSL Model were systematic.
- b. 85% of respondents stated that the steps in the instructional design CPSL Model were appropriate.
- c. 66% of respondents said the steps in the instructional design CPSL Model are easy to implement,
- d. 95% of respondents stated that the stages in the instructional design CPSL Model can improve the quality to be ready to use in employment.
- e. 92% of respondents stated that the stages in the instructional design CPSL Model were right for Vocational universities.

DISCUSSION

Changing the initial product design of the CPISL learning model to CPSL by eliminating this improvement is more appropriate, because in Vocation College forming student performance starting from the basics, this is different from training/education for employees who are indeed having improvement competence, so Frank uses the CPI learning design.

Based on the data in Table 2, the results are good and good enough to be continued, but there are 1 question which answers are not good, this is related to the right or wrong of social learning in the classroom. Social learning theory is new compared to other learning theories, social learning is learning through interaction with the expert community and fellow students.^[35] In Vocational College percentage of practice courses is greater than theory, so learning activities are more in place of practice than in the classroom, so that many respondents are less sure social learning can be carried out in the classroom.

Questions about the analysis of student potential that will describe the real abilities of students, many respondents are not sure about this too. This happens if the potential of students is seen from the values or scores that students already have, so that

there is still possibility of the existence of not objective, for example when taking scores, the physical or psychological condition of students are not good, it will affect when working on the exam and impacts on its value. So to minimize this, the analysis of the potential of students is not only seen from the values obtained but equipped with the initial ability test.

Based on the arguments of the respondents. the stages in instructional design CPSL model has been systematic with complete stages of performance analysis, determining learning objectives, designing learning until evaluation. The CPSL learning design model is also right, easy to implement, and can improve the quality of graduates to be ready to use in employment, because their competencies are truly based on the competencies of personnel needed by users, making it right for Vocational college. In the instructional design application of the CPSL Model, Lecturers are required to be more creative and innovative.

CONCLUSION

Vocational College, which prepares graduates to be ready for work, has a difference in the instructional design model compared to public universities, so there needs to be a special instructional design for vocational College, which is the instructional design CPSL Model.

The instructional design of the CPSL Model must be made by vocational lecturers of universities and need to be upgraded, if there are changes in graduate competencies tailored to changing user needs

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Make improvements to the final product, 10) Undertake product dissemination and implementation, and disseminate products

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