

Developing Of MONAKI Model On Nursing Information System To Improve 21st Century Competencies

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Abstract: The research was based on preliminary studies and needs analysis conducted on Nursing Information System Courses, which was found the problems in the Information System was not optimal. These were caused by several factors, among others, the model and learning strategy were not appropriate and have not been implemented by the concept of student centered learning. A need analysis was also found the existence of the personality/needs of lecturers and students who have high expectations of the learning process to improve the competencies of the 21st century, among others critical thinking, communication, collaboration, and creativity. This study was aimed at producing a MONAKI Based learning model on Information System courses in higher education that were valid, practice and effective. Type of the research was a Research and Development (R and D), and the development methods and procedures used the ADDIE model with five stages are Analysis, Design, Development, Implementation and Evaluation. The analysis technique uses the Aiken'V test, and the validity uses expert testing and Focus Group Discussion (FGD). The practicality test was carried out by applying the product to students in form of a product practicality questionnaire and to test the effectiveness of the product using experimental and control classes. The findings of this research were a MONAKI Based Learning model on Nursing Information System in Higher Education, which was equipped with a Model Book, a Teaching Module, and Learning Manuals. The model and support system met the validity criteria which suitable for using according to experts. Model and Modul development met practicality criteria with practical values according to lecturers and students. The results of the effectiveness test show that the activities and learning outcomes are significantly improved by using the MONAKI Experimental class compared to the control class. The ability of critical thinking, communication, collaboration and creativity (4C) have significantly developed. The results of this study can be used by lecturers, students and learning designers. The implication of this study was that the MONAKI based Learning model have been able to optimized the learning process in the Information System courses in Higher Education. Based on the findings, it can be concluded that the new development model has significantly improve the students learning.

Index Terms: Developing Model learning, MONAKI, R and D, Nursing Information System

1. INTRODUCTION

Education is one of the important factors in a country's development. Education has a role to improve the quality of Human Resources (HR) owned. Education is a conscious effort to prepare students through guidance, teaching or training activities for their role in the future. Today education is faced with various changes in all aspects of life in society. This is due to the rapid development of Science and Technology, as well as globalization which has swept the world including the Indonesian people. With these changes, the world of education is expected to be able to make a real contribution in the form of improving the quality of educational outcomes and services to the community. Currently the implementation of education in Indonesia has been referring to the direction of world education oriented to 21st century learning [1]. As a result of demands for changes in the direction of education laden with the opening of global competition as a result of the flow of information technology and the existence of the internet. Unlimited information causes global competition which makes Indonesian HR have to compete with HR without knowing their country of origin [2]. Therefore improving the quality of human resources adjusts to the needs of knowledge-based 21st century human resources for the demands to be professional [3].

The burden in developing curriculum based on the ability to become a reliable and professional human resource in mastering a source of knowledge causes the educational process to innovate and develop efforts to implement creative education. Educators are responsible for developing students' skills and competencies through efforts to prepare students to have global skills [4]. BNSP (2010) states that some of the global skills that must be possessed by Indonesian HR are 1) critical thinking and problem solving skills, 2) communication and collaboration skills, 3) creation and skills updating (creativity and innovation skills), 4) information and communication technology literacy, 5) contextual learning skills, 6) cooperative literacy skills in utilizing multimedia and communication (media literacy skills). Problem Based Learning model (PBM) is a learning model that is included in the information processing family learning model group. Essentially this model group emphasizes ways in increasing the natural drive of humans to shape meaning about the world by obtaining and managing data, perceiving problems and producing appropriate solutions and developing concepts and languages to transfer data solutions [5]. The application of Problem Based Learning in professional learning and training has been extensively studied in the past 20 years [6]–[12]. Specific form of PBM is the research practice learning model or often also called the scientific inquiry exercise learning model [14]. Through this research and development, a new syntax called MONAKI syntax will be designed. This development is carried out to ensure a problem based learning model with specifications in this inquiry exercise can be carried out according to standard scientific research procedures. This is the author's attempt to further enhance students' understanding of scientific research so that the practice of inquiry can really be felt to be a means of increasing the ability to think actively and creatively in solving conceptual and real problems. This is in accordance with

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PBM's superiority that by working on authentic problems knowledge will be formed, develop investigations and higher-order thinking skills, and develop independence and confidence [15].

2. RESEARCH METHOD

This research is a development research that uses Research and Development (R & D) design. Research and Development is a research model used to produce certain products, and test the effectiveness of these products [16]. This development research was designed to produce a product that is in the form of an authentic assessment instrument in Network Learning Course. This development research product uses ADDIE models consists of five phases (analysis, design, development, implementation, and evaluation). The instruments used in this study are validation instruments, practicality instruments, and effectiveness instruments [5]. The technique of collecting qualitative data is done by interview, observation and study documentation [17]–[19]. The validity of qualitative data credibility; the term used in qualitative research to replace the concept of validity on quantitative data is tested. Data credibility can be maintained by using several criteria of examination techniques, namely: 1) extension of the researcher's participation in the field, 2) increasing observational persistence, 3) triangulation [20]. The quantitative data is analyzed by descriptive statistics, while qualitative data is analyzed and presented with reduction, display, and conclusions [21]. The type of data in this study is primary data that is data obtained directly from validators (experts), lecturers and students taken through a questionnaire testing the validity, practicality and effectiveness of the model. Material validation data was obtained from instruments filled out by validators who were education experts. Material practicality data was obtained from observer assessments that observed learning activities conducted by lecturers and students who took part in learning Nursing Information Systems using the PBM MONAKI model. The number of students who take part in the research is in accordance with student attendance in the Nursing Information System courses section. Data on the effectiveness of teaching material was obtained from the cognitive, affective and psychomotor abilities of students about cognitive abilities which were carried out by comparing the cognitive abilities of students in the Nursing Information System of the experimental group and the control group. Affective and psychomotor aspects were assessed by analyzing the ability of students only in the experimental group.

3. RESULTS AND DISCUSSION

The MONAKI learning model is a learning model that is characterized by a special syntax which stands for the term of the title of the model itself. Development is carried out based on the problem based learning model (PBL) with the learning model of the Scientific Investigation Exercise which is another form and is more specific than the PBL model. The rationale for developing the PBL MONAKI learning model is that researchers need a complete and structured syntax to bring students in a more in-depth and complete learning process in conducting their scientific procedures. The development of the PBL MONAKI learning model has a foundation of thinking in accordance with cognitive learning theory, with the stages of the Cognitive learning process developed by Gagne.

As a learning model, MONAKI model has components. Joyce and Weil (2009) stated the components of a learning model are 1) Syntax, 2) Reaction principles, 3) Support systems, 4) Social systems, 5) Instructional impacts and accompaniment impacts. Arends (2001: 24) states that the concept of the learning model developed by Joyce et al. can be used as a source of the design of the learning process where the results of implementing the learning process design are the competencies that have been formulated. Based on this, it is recommended to implement effective learning models in the learning process to achieve the competencies that are formulated. The concept of the learning model Joyce et al. and Arends broader than the concept of strategy and learning methods. Thus, using the learning model offered by Joyce et al. and Arends means that they have used methods and learning strategies that are arranged systematically and have been tested through research to achieve learning outcomes in the form of competencies that are specific to these models. Syntax of MONAKI as shown on figure 1.

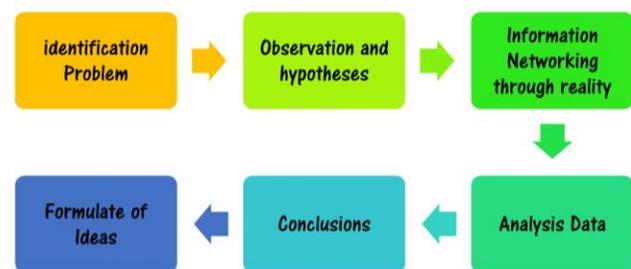


Fig. 1. Syntax of MONAKI based learning

The social system that emerges in the application of the MONAKI PBM learning model is collaboration between students in carrying out scientific research processes that have certain procedures. Encouragement of scientific interaction social nuances are social systems that arise in learning. In a cooperative learning climate, students are brought into a learning environment that uses scientific techniques that support students with the understanding of scientific inquiry that has a standard scientific concept. Collaboration in carrying out one purpose of inquiry by organizing assignments and together learning about the concept of scientific inquiry challenges the curiosity of students in solving one case. The sense of social responsibility of students that arises because the disclosure of cases based on real problems encountered in the field increases student motivation to be social beings who are sensitive to the surrounding problems.

3.1 Validity Test Results of MONAKI Model

Validators in this study were 5 (five) experts consisting of language experts, instructional media experts and material or curriculum experts. Validators are asked to provide assessments and suggestions for improving the learning model and design of learning tools. Based on the results of the validator assessment, the components of the MONAKI model are stated as valid, as shown in table 1.

TABLE 1
RESULTS OF THE VALIDATOR ASSESSMENT OF THE MONAKI

Aspect	Score validator					Σs	Aiken's V	Result
	V.1	V.2	V.3	V.4	V.5			

Syntax	4	4	5	4	4	17	0.85	Valid
Social S	4	5	5	4	4	15	0.75	Valid
Reaction	4	4	4	5	4	16	0.80	Valid
Support	4	5	5	4	4	15	0.75	Valid
Instruct	3	5	4	5	4	17	0.85	Valid
Nurturant	4	5	5	4	5	18	0.90	Valid
$\sum s$	23	28	28	27	25	98	4.92	Valid
Average	3.83	4.67	4.67	4.50	4.17	16.33	0.82	

data was obtained from the practicality questionnaire by lecturers and students on the implementation of computer network learning using the MONAKI model. Lecturers and students are asked to provide assessments and suggestions for improvement on the use of modules, learning media, and learning tools (RPS and SAP) used in Nursing Information Systems courses. The results of the analysis of the practicality of the MONAKI model are very practical based on tables 2

TABLE 2
RESULTS OF PRACTICALITY MONAKI

Scale	Responden	$\sum s$	Ave (%)	Category
Small	Lecturer	2	79.33	Practice
	Student	3	78.45	Practice
Intern	Lecturer	3	79.45	Practice
	Student	3	78.50	Practice
Large	Lecturer	6	82.75	Very Practice
	Student	27	83.44	Very Practice

The construct validation in the developed model was assessed from 5 (five) indicators including; model syntax, social systems, reaction principles, supporting impacts, and instructional and accompaniment impacts. Analysis of the validation of the syntax construct of this model was performed using the LISREL 9.3 software program. The overall model assessment can be obtained based on the model suitability index (Goodness of fit statistics) produced by LISREL. The most common model accuracy index is the Chi-Square value [22]. To assess the fit model, it is expected that the Chi-Square value is not significant ($p\text{-value} > 0.05$). In addition, from these results we also meet with the interpretation of the loading factor. By definition loading factor is a large correlation between the indicator and its latent construct. Large factor weight references of 0.50 or more are considered to have validation that is strong enough to explain latent constructs.

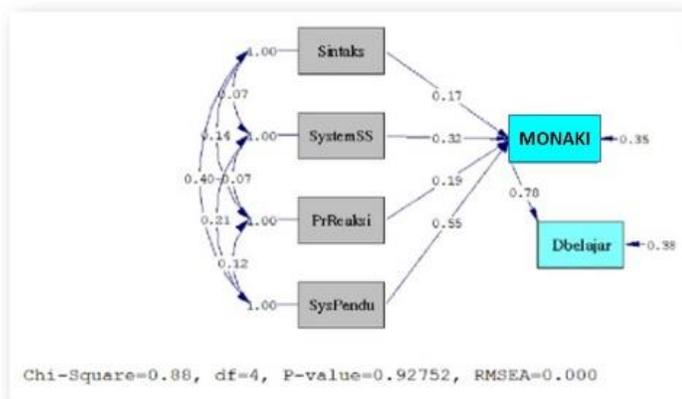


Fig. 2. CFA Test Result of MONAKI

CFA statistical test results show the value of the Goodness of fit index (GFI) on the MONAKI model are as follows:

- Root Mean Square Error of Approximation (RMSEA) = 0.00
- Normed Fit Index (NFI) = 0.98
- Non-Normed Fit Index (NNFI) = 1.36
- Comparative Fit Index (CFI) = 1.00
- Incremental Fit Index (IFI) = 1.07
- Relative Fit Index (RFI) = 0.93
- Standardized RMR = 0.022
- Goodness of Fit Index (GFI) = 0.08
- Adjust Goodness of fit Index (AGFI) = 0.92

Analysis of the CFA test on the MONAKI model interpreted that the MONAKI model was fit

3.2 Practicality Test Results of MONAKI Model

After the research product is valid, this practical trial test is conducted to determine the usage or implementation of the learning tools used by lecturers and students. Practicality

3.3 Effectivity Test Results of MONAKI Model

The Effectiveness Test of the MONAKI Model is done by comparing the experimental class learning outcomes with the control class that does not use learning tools that are developed based on the MONAKI model principles. It aims to see whether the MONAKI model influences student cognitive learning outcomes.

T-test was used to see the level of difference between experimental class learning outcomes and the control class in this study. Before the t test is performed, the analysis requirements test is carried out namely the normality and homogeneity test. The results of the t-test can be described as follows:

1. Normality test

Normality test was carried out using SPSS with Kolmogorov Smirnov and Shapiro Wilk statistics with a significant level $\alpha = 0.05$. The test results can be seen in table 3

TABLE 3
RESULT TEST OF NORMALITY
Tests of Normality

Group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Stat	df	Sig.
Eksperiment	.149	27	.127	.943	27	.148
Control	.145	25	.189	.950	25	.256

a. Lilliefors Significance Correction

From the SPSS results above, it can be seen: For the control class, sig value is 0.189 / 0.256 > 0.05 which means that the data is normally distributed. For the experimental class, sig values 0.127 / 0.148 > 0.05, which means the data are normally distributed. So, it can be concluded that the two data are normally distributed.

2. Homogenitas Test

Homogeneity test is performed on the value of student learning outcomes using the levene test with SPSS software with data criteria said to be homogeneous if the significance level is greater than 0.05. The test results can be seen in table 4.

TABLE 4
RESUTEST OF HOMOGENITY
Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1.321	1	50	.256

Based on the SPSS results presented in table 4.19, a sig value of 0.081 > 0.05 is obtained, meaning that the data has the same or homogeneous variance.

3. t-Test

The t-test that was carried out was the two independent test of the mean mean. T-test was performed using SPSS software with a significant level $\alpha = 0.05$. The test results can be seen in table 5.

TABLE 5
RESULT OF T-TEST

	Levene's Test for Equality of Variances		t-Test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	3.177	.081	2.836	50	.007	3.93696	1.38806	1.14897	6.72496
Equal variances not assumed			2.868	47.882	.006	3.93696	1.37258	1.17703	6.69690

From the SPSS results above, the equal variances assumed (homogeneous sample) has a sig value of 0.007 < 0.05, which means there is a significant difference between the learning outcomes of the control class and the student experimental class

4. CONCLUSION

Based on the results of research and discussion that refers to the objectives of this study, it can be concluded that : Development research has resulted in the MONAKI model in learning nursing information systems. The MONAKI model was validated by a team of experts and met valid criteria from the aspect of model construction with the average value of Aiken's V test results above 0.80.

MONAKI learning model developed after going through trials meets practical criteria so that it can be used as a learning model for nursing information systems. Significant differences were found, between the learning outcomes of the experimental class using the MONAKI model and the control class based on the results of the t-test. Based on that, the MONAKI model developed meets the effective criteria. Based on the results of confirmatory factor analysis (CFA), the monaki model is a learning model that is fit. The development of the MONAKI learning model aims as an empirical reference to be able to improve the quality of learning in accordance with the needs of students. Students should act as subjects of the learning process itself so that students are able to build their own knowledge. The development of the MONAKI model is formulated through stages (syntax) that emphasize the learning process on the real problem approach and then the process of solving it through collaborative forces so that students are able to collaborate with individuals.

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