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Effectiveness of Learning Strategies and Learning Styles to Information Communication Technology Learning Outcomes

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Abstract: ***The objective of this research is to study the Influence of instructional strategy of and learning styles on students' information communication technology outcomes. The research was conducted at IAIN Raden Intan Lampung with 76 students as samples selected randomly. The research applying experimental research with treatment by level 2x2. Result of the research are as follows (1) learning outcomes of the students with Contextual Teaching and Learning instructional strategy is higher than those who received expository instructional strategy, (2) there was interaction between instructional strategy and learning styles of the students, (3) learning outcomes of the students with visual learning styles are higher when Contextual Teaching and Learning Instructional strategy is used than when they learned with expository instructional strategy, and (4) learning outcomes of the students with auditory learning styles are higher is used than when they learned with expository instructional strategy. Result of the research shows that students' learning outcomes on information communication technology could be improved by applying appropriate teaching instructional strategy by considering their learning styles*** *level*

Keyword: Contextual Teaching and Learning, Ekspository Learning, learning styles

1. Introduction

One of the causes of low quality of education is the quality of learning. Improving the quality of learning begins with designing learning, well-designed learning and attention to the condition, choose the right strategy will improve the quality of learning and of itself will improve learning outcomes. One important factor to improve learning outcomes is the application of learning strategies appropriately so that the students can learn the strategies according to their characteristics, in line with lesson plans and as needed.

Learning strategies are the details of the selection and sequencing of events in the learning activities (Seels and Richey, 1994: 31) learning strategy covering various aspects in choosing a system implementation, sort and categorize the learning content, explains the components of learning that will be included in the study, determining how to group students for learning, making the learning structure and select the media to implement the learning (Dick & Carey, 2009: 178). There are three main activities in the learning strategy in the sense that the selection of instructional media, sequencing of learning materials and components associated with learning.

Some things have to be considered in the selection of learning strategies are: first, the extent to which the strategy was supported by the theories of psychology and learning theory exist. Second, how much strategy properly structured in making students achieve the learning objectives that have been set previously (Mukhtar and Iskandar, 2012: 187-188).

Competencies expected of course the communication of information technology is expected to equip prospective teachers carry out duties as a teacher in the learning process more effectively. In order for a higher quality of learning required intensive student involvement in the learning process. The involvement of students can be seen from their active participation in the learning process. The involvement based on high motivation and interest of students. Lecturer of information communication technology, in addition to mastering a broad and deep knowledge of the lecture material information communication technology, are also required to master the use of various learning strategies that can generate interest and motivation of students in the learning process.

Student in the learning process is not just memorize the basic concepts in information and communications technology but training them to improve the understanding, reasoning power and power analysis. In other words, we need a strategy that basically gives more opportunities to take the initiative rather than simply listen to or receive information.

One strategy that can be applied in: contextual strategy or Contextual Teaching and Learning (CTL) is a learning strategy that emphasizes the involvement of students in the full process to be able to locate the material studied and connect with real life situations and (Sanjaya, 2012, 255). Contextual approach helps lecturers link between the material being taught by real-world situations, the learning process takes place naturally in the form of student work activities and experience, not a transfer of knowledge from teacher to student. The goal is to facilitate the lecturers in the field to improve the quality of constructivism-based learning (Johnsons, 2002: 82). In line with the above opinion, argued that the CTL help students connect the content they are learning in the context of life in which content can be used (Berns and Erickson, 2001: 2).

From the above opinion, it is known that CTL capable explored comprehension strategies and academic ability of students in a variety of contexts, inside or outside the

classroom, in order to resolve the problems it faces either independently or in groups. There are three things that must be understood in a contextual strategy: first, CTL emphasis on student engagement process to find the material, which means that the learning process is oriented to the process of direct experience. Second, CTL encourages students to find materials studied material relationship with real life situations, meaning that students are required to be able to capture the relationship between school learning experiences in real life. Third, CTL encourages students to be able to apply in life, meaning that CTL is not just expect students to understand the material being studied, but what about the subject matter that can color their behavior in everyday life.

Eight components of the CTL strategy are: (a) make meaningful linkages-linkages, (b) perform meaningful work (c) conduct self-regulated learning (d) cooperation (e) critical and creative thinking, (f) assist individuals to grow and develop (g) achieve high standards (h) using authentic assessment (Johnsons, 2002: 43). Learning activities with contextual approach developed, have several components, namely: (1) problem-based learning, (2) learning with multi-context, (3) Self-Regulated Learning (SRL), (4) Ratings are authentic, (5) learning community. (Bern and SeStefano, 2001: 1)

Contextual Teaching and learning strategies (CTL) is derived from constructivist theory. Implications of constructivist theory of learning, among others: (1) Stresses the role of the student in his own initiative active involvement in learning activities in the constructivist classroom, so the knowledge representation not to be stressed; (2) the typical constructivist approach to teaching scaffolding apply, with students increasingly responsible for their own learning (RJ, 2010: 151-152).

Several studies conducted strengthen advantage of contextual strategies, among others, the results of research conducted by Heruman 2002 at primary school Adetex Arjasari District of Bandung Regency reveals that contextual learning can improve student learning outcomes, they are actively involved and able to relate the topic and the issues facing so that students are excited to learn. During the learning process of the students showed a positive attitude, love to learn in groups or individually, do not despair in the face of difficult issues and confidence in solving everyday problems. (Huruman: 2003: ii)

Contextual strategy is different from expository teaching strategy that the emphasis on the learning process centered on the teacher (teacher centered) lecturers become the main information source and giver (David Jacobson, Paul Eggen and Donald Kauchak, 2005: 166). Expository strategy the teacher presents the material in a form that has been prepared in a neat, systematic and complete (Ma'mun, 2011: 233). While the contextual role as a faculty mentor students so they can learn according to the stages of development, so that children are able to facilitate the process enhance the existing schemes (assimilation or process of forming a new scheme (accommodation).

Expository learning strategy provides two main advantages, namely in terms of time and supervision. Through a strategy of expository material can be quickly delivered and received by the students. Moreover, this learning strategy is needed in learning relative followed by the number of students that are too large to be able to use another approach. One important factor that must be considered by the lecturers in applying learning strategies are factors of student learning styles. Learning style is the way in which is the person begins to call now concentrate) on, process, and retain new and difficult, information. Concentration Occurs differently for different people at different times (Dunn, Shirley A. Griggs, 1999: 14) The style of learning is considered as "the properties of cognitive, affective, is an indicator of how learning perceive, interact with, and respond to the environment learning (Alexandra and Moldovan Georgeta, 2008: 578).

Complementing the above opinion, according to Kia learning style is the way a person does in their learning and how is faced with situations in everyday learning. There are four basic models of learning that affect a person's learning style. These four basic models are (a) the experience of concrete or concrete experience (b) reflective or reflective observation obstructive (c) an abstract concept or abstract conceptualization and (d) experimenting activity or active experimentation. (Mahdi Moeni Kia. Et al, 1992: 2)

Learning styles of students are divided into three types: (1) the type of visual learning style (2) the type of auditory learning styles, and (3) the type of kinesthetic learning style (Silberman, 1996: 4-5). Through this type of learning style that became the foundation in the theory of learning styles variable, which is limited research on learning styles visual and auditory learning styles. According to Yellin & Blake, visual learning style is learning styles tend to think globally, guess intuitively, using motion, and prefer to study the background information. Learners who have a learning style has the following characteristics: the students will learn better when the material is presented in a format that can be viewed on the board, maps or charts, transparency, and through books (Yellin, David & Mary E. Blake, 1994: 82-83).

In contrast to the visual learning style, Rose & Nichols said auditory learning style is learned through hearing something (Rose, Colin and Malcolm J. Nicholl, 1997: 130). The characteristics studied auditoris is learners prefer to sound, prefer a less bright light, more like an informal design, not continuous learning, prefer to receive when learning, and love to learn with peers (Dunn, Shirley A. Griggs, 1999: 356). The problem in this study is limited to; (1) the effectiveness of instructional strategies and learning strategies expository CTL as the independent variable (2) the effectiveness of student learning styles are distinguished visual and auditory as variable attribute (3) the effect of the interaction between learning strategy and learning style of the student learning outcomes. This study aimed to obtain the effectiveness of instructional strategies and learning strategies expository CTL to the learning outcomes of information and communication technology. Effectiveness of differentiated learning styles of visual and auditory information technology on learning outcomes of communication. The influence of the interaction between

learning strategies and learning styles on student learning outcomes.

2. Methods

The method used in this research is to design an experimental method of treatment by the level of 2 x 2 which aims to determine whether there is an interaction between learning strategy and learning style on learning outcomes of information communication technology. Learning strategies and learning styles are categorized as independent variables and the communication of information technology learning outcomes as the dependent variable. The influence of independent variables on the dependent variable is referred to as the influence of the constellation of interaction can be seen through the table 1.

Data obtained by the test material to the communication of information technology second semester students majoring in Islamic Education at the end of the experiment. The research activities carried out for 6 months with a test period between February to July 2013. Prior to the data analyzed, the analysis prerequisite test of normality and homogeneity test data. Test for normality using Lilliefors test, while homogeneity test using test Bartlett analysis.

Hypothesis testing is done using analysis of variance (ANOVA) and two lines follow the treatment plan by level 2 2 that the design could be seen through the table 1. In the next phase of significance testing using Tuckey test or also called honestly significant difference test or honestly significance difference.

Table 1: Treatment by Level 2x2 Draft

Learning Style (B)	**Learning Strategies**	
	Contextual Teaching and learning (CTL) (A1)	Ekspositori (A2)
Visual (B1)	A1B1	A2B1
Auditori (B2)	A1B2	A2B2

3. Results

Of calculations performed on the results of student learning information and communications technology as shown in Table 2, the group of students who applied learning with CTL strategy, obtained n = 22, with an average score = 26, 045; standard deviation = 6.799. Medium calculations performed on the learning outcomes of students in information and communications technology applied group learning with expository strategy, obtained n = 22, with an average score = 2.182. Standard deviation = 2.719. Learning outcomes at the group communication information technology student with a visual learning style, learning the strategies applied CTL obtained n = 11, with an average score = 31.636. Standard deviation = 4.478. The calculation of the learning outcomes of information communication technology in the group of students with auditory learning styles applied learning with expository strategy obtained n = 11, with an average score = 21.818; standard deviation = 2.639.

Table 2: Summary of the Data results

Learning Style (B)	*Learning Strategies (A)*				Σ	
	CTL (A1)		*Ekspositori (A2)*			
Visual (B1)	n = 11	Me = 32	n = 11	Me = 22,500	N = 22	Me = 27,09
	Xt = 38	Mo = 24,500	Xt = 27	Mo = 22,500	Xt = 38	Mo = 23
	Xr = 25	SD = 4,478	Xr = 18	SD = 2,876	Xr = 18	SD = 5,927
	$\bar{X}$= 31,636		$\bar{X}$= 22,545		$\bar{X}$= 27,091	
Auditori (B2)	n = 11	Me = 20,500	n = 11	Me =21,830	N = 22	Me =21,14
	Xt = 25	Mo =20,500	Xt = 26	Mo=19,000	Xt = 26	Mo= 19
	Xr = 16	SD = 2,876	Xr = 18	SD =2,639	Xr = 16	SD = 2,783
	$\bar{X}$= 20,455		$\bar{X}$= 21,818		$\bar{X}$= 21,136	
Σ	N = 22	Me = 25,000	N = 22	Me = 22,500	N = 44	Me = 26,05
	Xt = 38	Mo = 23,5	Xt = 27	Mo = 21,5	Xt = 38	Mo = 23,000
	Xr = 16	SD = 6,799	Xr = 18	SD = 2,719	Xr = 16	SD = 5,478
	$\bar{X}$= 26,045		$\bar{X}$ = 22,182		$\bar{X}$= 26,045	

The above data was tested by analysis of variance to test the effectiveness of influence between the columns, between lines and interaction between the rows and columns. The result of calculation analysis of variance (ANOVA) and two lines that describe the learning outcomes of information communication technology in groups of data results can be seen by Table 3 as follows:

Table 3: Summary of Two-Way ANOVA Test Results

Varians resources	db	Jk	RK = JK/db	$F_{calculate}$= RK/RKD	F_{table}	
					0,05	0,01
Learning Strategies (A)	1	164,205	164,205	15,077*		
Learning Style (B)	1	390,023	390,023	35,812*	4,08	7,31
Interaction factor (AxB)	1	300,568	300,568	27,598*		
Influence (D)	40	435,636	10,891	-	-	-
Total Correction (T)	43	2,145,227	-	-	-	-

Table 3 produced three results of the analysis of variance, the variance of the line (A1A2), the variance column (B1b2), and the interaction between the lines (A) and column (B). In the analysis of variance between groups line with the strategy applied learning CTL (A1) and the group that applied learning with expository strategy (A2) on learning outcomes demonstrate the value of information and communications technology $F_{calculate}$ = 15.077 is greater than the significance level alpha F_{table} α (0.05) = 4.08, and greater

than the value at significance level α F_{table} (0,01) = 7.31. This means, there are differences in learning outcomes of significant information technology communication between the group with the group A1 A2. Thus, the hypothesis that the learning outcomes of group communication information technology applied learning strategies CTL higher in the study group communication information technology applied learning expository strategy was proven correct.

Results of ANOVA two lanes on the interaction between the test line (A) and column (B) shows the influence of the interaction between learning strategy and learning style on learning outcomes of information communication technology. This conclusion was obtained after obtained $F_{calculate}$ = 27.598 is greater than the value at significance level α F_{table} (0,05) = 4.08 and the value F_{table} at significance level α (0,01) = 7.31. This means that, the hypothesis that there is an interaction between learning strategy and learning style on learning outcomes of information communication technology is proven true.

For further testing of the results of the analysis of variance is used Tuckey -Test. Summary Tuckey test results can be seen in the following table:

Table 4: Summary of Test Results Tuckey

No.	Groups	$Q_{calculate}$	Q_{table} α = 0,05
1	Y_{11} to Y_{21}	9.136	3,11
2	Y_{12} to Y_{22}	3,655	3,11
3	Y_{11} to Y_{12}	11,181	3,11
4	Y_{21} to Y_{22}	3,746	3,11

Furthermore Tuckey test results on a visual learning style groups (B1), between the applied learning strategies CTL (A1B1) and applied learning with expository strategy (A2B1). Based on Table 4, obtained $Q_{calculate}$ = 9.136 is greater than the significance level α Q_{table} (0,05) = 3.11. Thus H0 is rejected at significance level of 0.05 (9.136> 3.11). In conclusion, the effectiveness of the improvement of learning outcomes information and communications technology in a visual learning style groups (B1), which is applied learning strategies CTL (A1B1) is higher than the group of students who applied learning with expository strategy (A2B1). Thus, the hypothesis that the effectiveness of the improvement of learning outcomes information and communications technology in a visual learning style groups that applied learning with CTL strategy is higher than that applied learning with expository strategy was proven correct.

Meanwhile, the auditory learning style groups (B2), comparison of the effectiveness of the learning outcome of communication between groups of information technology applied to learning the strategies CTL (A1B2) and the group that applied learning with expository strategy (A2B2), showed that $Q_{calculate}$ = 3.655 is greater than Q_{table} at significance level α (0,05) = 3.11. Thus H0 at significance level of 0.05. In conclusion, the effectiveness of the improvement of learning outcomes at the group communication information technology students with auditory learning styles applied learning strategies CTL (A1B2) is lower than the communication of information technology learning outcomes of students who applied to group learning with expository strategy (A2B2). Thus the hypothesis that the effectiveness of the learning outcome in the group of information and communications technology applied auditory learning style learning with CTL strategy is lower than that applied learning with expository strategy also proved correct.

Thus, it can be concluded that: (1) the effectiveness of group learning strategies applied CTL demonstrated learning outcomes of information and communication technology is higher than that applied to group learning with expository strategy, (2) the effectiveness of the group of visual learning styles, learning outcomes of information technology communication with students who applied learning strategies CTL higher than the group that applied learning with expository strategy, (3) the effectiveness of the group of auditory learning styles, learning outcomes of information technology communication with students who applied learning strategies CTL lower than the group that applied learning expository strategy and (4) there is an interaction effect between learning strategies and learning styles on learning outcomes of information communication technology.

4. Discussion

The results of the study described in the previous section shows that, the effectiveness of group learning strategies applied CTL, showing the learning outcomes of information communication technology is higher than the group that applied learning with expository strategy. The results of the study by Heruman revealed that contextual learning can improve student learning outcomes, (Huruman: 2003: ii). Effect of CTL learning strategy for student learning outcomes are very diverse. CTL affect communication skills, because during the learning process of the students are stimulated to ask questions, dialogue and discusion. CTL have an influence on increasing motivation, as students actively seek out the information needed to answer the question itself that is relevant to their own needs by making use of the Internet or book- textbooks in search of information. The strategy has implications for the cognitive abilities of students, as long as they make a summary of the learning process, means students are trained to find the main idea in the literature.

The effectiveness of the learning outcomes of information communication technology students who have a visual learning style get CTL and learning strategies that get expository learning strategies. The mean score of the learning outcomes of students who have a visual learning style that learned using CTL higher learning strategies than students learned with expository strategy. The results of this study supported by the results of research conducted by Zulkifli that learning through contextual approach by providing the student worksheets, then when the lesson, students will be actively involved in constructing knowledge. In addition, an increase in significant student learning outcomes (Zulkifli, 2004: ii).

Results of research conducted Dinarsiani, revealed that students 'learning styles are also different mathematical learning outcomes significantly and tested style that gives an independent field study of higher mathematics learning outcomes of the students' learning style field dependent, but the learning models and styles study there was no interaction. This implies that the model can applied multi grade teaching to all students who have a variety of learning styles. (Dinarsiani, 2002: 13).

Learning strategies CTL derived from constructivist theory. Implications of constructivist theory of learning, among others: (1) give priority to the role of the student in his own initiative active involvement in learning activities, presentation of knowledge so (ready made) does not receive such emphasis on expository strategy (2) applying the constructivist approach to teaching scaffolding, with more students increasingly responsible for their own learning to learn new information, finding new ways to learn and use technology as a tool to achieve the goal of learning such as using the Internet to search for information. In this constructivism learning the overall function of the brain involved in the process of creating seek new ideas, so the more motivated students' motivation, strategy is appropriate for students who have a visual learning style.

The effectiveness of the learning outcomes of information communication technology students have auditory learning styles are gaining CTL and learning strategies that get Indications expository strategy research shows that student learning outcomes using CTL learning strategy is lower than the learning outcomes of information communication technology students use learning strategies expository. Application of learning activities using expository teaching strategy, students will be exposed to certain concepts that must be memorized, so it does not require students to think again and after the learning process is over, students are expected to understand correctly the way back can reveal material that has been described.
Expository strategy is more influenced by the behavioristic learning theory. According to the flow behavioristic learning is essentially the formation of associations between sensory impressions captured with a tendency to act or the relationship between stimulus and response (SR). In expository strategy implementation, the role of the lecturer as giving a stimulus is a very important factor and more dominating. On students who have auditory learning style, this expository learning strategies make them more comfortable, so that the learning outcomes of students who learned with expository learning strategy is higher than students who use learning strategies CTL.

Effect of Interaction between learning strategies and learning styles on learning outcomes of information communication technology. Many things to consider in learning, in addition to the selection of learning strategies should also pay attention to the characteristics of student learning styles among them. Selection of appropriate strategies have an impact on the outcome of effective learning (learning objectives achieved).

CTL strategy can be organized into learning activities that emphasize the involvement of students (student-oriented). This activity is what distinguishes the learning strategy that emphasizes expository emphasis on faculty-centered activities (teacher-oriented). Students who are familiar with the learning process based on the lecturer will provide receptive and passive role, if applied to the CTL strategy and they will be more comfortable with expository learning strategies. It was identified that the learning outcomes will be achieved well when adapted to the learning style of the student owned, thus learning outcomes information and communications technology will be achieved well when applied learning strategies appropriate to the student's learning style. This study examines only in terms of learning strategies and learning styles. Aside from CTL and expository strategy many other strategies can be applied in the lecture that affect learning outcomes of information communication technology. Researchers just look at factors other than the learning styles of these factors there are other variables that can affect learning outcomes such as independent learning, motivation, and others that can be studied.

5. Conclusion

The results of data analysis showed that the overall effectiveness of group learning strategies applied CTL, showing the learning outcomes of information communication technology is higher than that applied to group learning with expository strategy. From these findings it can be concluded that in order to improve the learning outcomes of information communication technology, can be done by using CTL learning strategies.

In the group of students who have a visual learning style, communication of information technology learning outcomes of students who follow CTL higher learning strategies than students who attend Expository learning strategies. From these findings it can be concluded that in order to improve the learning outcomes of information communication technology students who have a visual learning style can be done by using CTL learning strategies.

Group of students with auditory learning styles, educational psychology learning outcomes of students who follow the lower CTL learning strategies than students who take Expository learning strategies. From these findings it can be concluded that in order to improve the learning outcomes of information communication technology students who have high levels of auditory learning styles can be done using Expository learning strategies.

There is the effect of the interaction between learning strategy and learning style on learning outcomes of information communication technology. The final conclusion is that in order to improve learning outcomes for students of information communication technology that has the visual learning style can be done by using CTL learning strategy, contrary to students who have auditory learning styles can be done with Expository learning strategies. At the end of the learning process of information communication technologies are expected to apply learning strategies and learning strategies expository CTL suit the learning style of every student in the lecture.

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