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Judul : *Free Online Learning Based On Rich Internet Applications; The Experimentation Of Critical Thinking About Student Learning Style*
Penulis : Chusnul Muali, M.Pd., Syaiful Islam, M. Pd., et al.
Identitas : *IOP Conf. Series: Journal of Physics: Conf. Series* **1114** (2018) 012024
No. Pemeriksaan : 1434806423

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Free Online Learning Based On Rich Internet Applications; The Experimentation Of Critical Thinking About Student Learning Style

by Syaiful Islam

Submission date: 08-Jan-2022 01:45PM (UTC+0900)

Submission ID: 1541639674

File name: f_Critical_Thinking_About_Student_Learning_Style-converted_1.pdf (251.25K)

Word count: 3808


Character count: 24922

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Free Online Learning Based On Rich Internet Applications; The Experimentation Of Critical Thinking About Student Learning Style

To cite this article: Chusnul Muali *et al* 2018 *J. Phys.: Conf. Ser.* **1114** 012024

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Free Online Learning Based On Rich Internet Applications; The Experimentation Of Critical Thinking About Student Learning Style

Chusnul Muali^{1*}, Syaiful Islam¹, Mushfi El Iq Bali¹, Hefniy²,
Hasan Baharun², Akmal Mundiri², Moh. Jasri³ and Ahmad Fauzi⁴

¹ Faculty of Islamic, Nurul Jadid University, Probolinggo, Indonesia

² Postgraduate Program, Nurul Jadid University, Probolinggo, Indonesia

³ Department of Informatics, Nurul Jadid University, Probolinggo, Indonesia

⁴ Departement of Islamic Education, IAI Zainul Hasan, Probolinggo, Indonesia

* yayahdaddy@gmail.com

Abstract. The purpose of this research is to know the ability of critical thinking process based on visual learning style, auditorial and kinesthetic students through self-based online learning based on Rich Intenet Applications (RAI). In this study, students are divided into three groups based on student learning styles. Data collection techniques used in this study are test, observation and learning style questionnaire. Meanwhile, the results of the analysis show that students who have visual, auditorial and kinesthetic style learning styles have better critical thinking skills when treated with self-directed online learning based on rich internet applications` (RAI) than students learning using conventional learning methods. It is from the value of F arithmetic interaction columns and rows 2,602 with probability 0.018. This value is smaller than the value of $\alpha = 0.05$ which means that the research hypothesis states that there is an interaction between independent online learning based on Rich Intemet Applications (RAI) and learning styles accepted.

1. Introduction

Whether or not it is realized, education in Indonesia is still far from successful. Education is an important vehicle and an effective medium for teaching norms, socializing values, and inculcating work ethics among citizens [1]. Education that cannot be separated from this learning activity has a very complex problem [2]. Although the regulations relating to the national education system have been compiled, it never solves the most basic problems of education, particularly the learning process. Student's thinking skills that become out of the learning process become rare because teachers prefer to pursue the target of completion of learning materials [3]. Student's thinking skills become very important as part of the outcome of the learning process. One type of thinking skills that can be used as an indicator of the success of a learning process is the ability to think critically because through the achievement of this critical thinking ability students are able to take a conical logical attitude in the process of making the right decision [4].

This is in line with what Shapiro (2000) says that someone who has the ability to think critically will perform activities that are reasonable, such as through observation, classify, select and sort, and take decisions to solve the problem [5]. Through this concept of critical thinking, students will be able to



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identify the essence of the problem and arrange the estimates into a scientific opinion, then try to make a tentative conclusion of the data obtained, and analyze the data it collects and evaluates as the final stage of the process thinking [6]. The concept of critical thinking is shown through several stages, such as reasoning, logical, rational, measurable, meticulous and meticulous to be the focus of problem-solving before decision making. Critical thinking is not just plain thinking, nor logical thinking that surrounds the cognitive domain through understanding alone without making the process of observation and exploration of the problem in order to get a solute solution. This is due to the ability of critical thinking to require intellectual ability and mentality higher level when compared with the ability to think cognition [7].

In this study, the selection of online self-learning concept based on Rich Internet Applications (RAI) is seen as one of the concepts of learning that provides an opportunity for students to perform critical thinking processes. Critical thinking by enabling students in their learning, often becomes predictor of the nature of learning in the classroom [8]. Rich Internet Application, then abbreviated as RIA, is an integrative technology between web and desktop applications. Interactive, attractive and user-friendly RIA display are some of the advantages possessed by RIA. In addition, RIA is also able to reach many users in its operation, because it is independent of the operating system on which its basic foundation [9]. Rich Internet Application puts the web as main media to present learning materials, integrate visual-audio in the form of interactive video and user interface from the desktop application. Aside from being a media presentation tool, RIA also has computing functions, sending and retrieving asynchronous background data based on user requests, reducing view and layout on the screen, and so on. In addition, RIA has responsive, useful, multiuser, and easy communication characteristics [10].

The study also looked at the results of a study conducted by Veronica and Mulyani (2010), entitled Rich Internet Apps Analysis and Web Design "Flex" has discussed web applications built using RIA technology with Flex Framework, the benefits of the application to help the community in searching for information on health and illness, helping diagnose the disease and displaying the recording of the diagnosis [11]. While in research Rustanto and Ikhwan (2010), entitled Application Development of Online Learning Software Mandiri with Rich Internet-based Application (RIA) Case study on the subject of Software Engineering which discusses about online learning or a web about software engineering courses, which can be utilized by students to do the learning independently by viewing or downloading material files other than those obtained during the course. RIA technology used by the application is more attractive and easy to use by the user [12]. In addition, a similar study was conducted by Imron et al., Entitled the design and implementation of an RIA-based Carnot learning cycle application for high school students who utilized the same media, the Rich Internet Application as a presentation medium [9]. The three studies mentioned above, have a similarity of research results, namely the use of Rich Internet Application media contributes greatly to the results and performance achievements for the subject of research.

Based on the three studies mentioned above, as well as related to student learning problematics and unavailability of visual aids as media, so that learning becomes abstractive and theoretical only, making learning result and critical thinking ability of students significantly different. media has a significant meaning in learning activities. The lack of clarity of the material or material presented in the lesson can be helped by presenting the media as an intermediary[13]. Seeing the tendency of different student learning patterns, the authors include the concept of learning styles as a moderator variable, so that the results of research becomes more dynamic.

The study aims to determine: (1) differences in learning outcomes between students who have different learning styles (Visual, Auditorial and Kinesthetic); (2) the difference in critical thinking skills between students learning by using independent online learning based on Rich Internet Applications (RAI) compared with conventional learning students; and (3) the interaction between independent online learning based on

Rich Internet Applications (RAI) and learning styles to students' critical thinking skills.

2. Method

This research is an experimental research with design pretest-posttest Control Group Design. The research subjects involved 120 students of MA Darul Lughoh Wal Karomah in Kraksaan Probolinggo Sub-district

of East Java. Before the group of students get treated first divided into three groups based on student learning styles. Characteristics of student learning styles determined by using learning style instruments. The data collection instrument is a matter of critical thinking ability test, observation sheet, and learning style questionnaire. While the test of validity, reliability, index of difficulty and distinguishing power using two-lane variance analysis with a significance level of 0.05.

3. Results

From the analysis using two-way variance analysis with significance level 0,05, found the result of analysis as table 1.

Table 1. Summary of Two-Way Variance Analysis

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	80.883 ^a	5	16.177	3.094	.013
Intercept	83820.016	1	83820.016	1.6034	.000
Learning	29.083	1	29.083	5.562	.021
LearningStyle	27.483	2	13.742	2.628	.078
Learning * LearningStyle	27.211	2	13.606	2.602	.018
Error	439.217	84	5.229		
Total	92105.000	90			
Corrected Total	520.100	89			

a. R Squared = ,156 (Adjusted R Squared = ,105)

The results of the analysis in Table 1 show that;

Results of Student Learning with Different Learning Styles

Obtained F value counted 2.628 <18.51 with a significance level of 5%. This means that F count is greater than the critical table which means the visual, auditory and kinesthetic learning styles do not differ significantly. With sig. value. = 0.078 > 0.05, it can be concluded that the hypothesis of this study which states there are significant differences between student learning outcomes with different learning styles in decline. These results indicate that there are no significant differences in student learning outcomes that have visual, auditorial and kinesthetic learning styles

Critical Thinking Ability based on Learning Method

With sig value. = 0.021 <0.05 which means that the value of significance is smaller than the value \bar{K} = 0.05, it can be concluded that the hypothesis of this study which states there are differences in critical thinking skills based on acceptable learning. These results suggest that students whose learning to use self-directed online based Rich Internet Applications (RAI) have better critical ability than students who use conventional learning.

Critical Thinking Ability Based on Learning Method and Learning Style

F arithmetic interaction columns and rows 2.602 with probability 0.018. This value is smaller than the value \bar{K} = 0.05 which means that the research hypothesis states that there is an interaction between independent online learning based on Rich Internet

4. Discussion

In the results of the above analysis, the following is a description and interpretation of data research results described by the variables observed in this study. as described in the previous description, that the

study will look at three variables, namely self-based online learning based on Rich Internet Applications (RAI), student learning styles consisting of visual, auditorial and kinesthetic, as well as students' critical thinking skills.

Results of Student Learning with Different Learning Styles

From the results of this study found that the learning style does not have a significant influence on student achievement and learning outcomes. Any student who has visual, auditorial and kinesthetic learning styles can learn the material in this study well. However, this needs to be further investigated using learning materials with a higher level of complexity, considering that this study uses learning materials that are classified as easier because it is a common and repetitive learning material [14]. Of the various characteristics of learning, one important characteristic related to information management is learning the style [15]. Learning strategy that seeks to empower students in conducting research activities, integrating acquired theories with practice, and practicing the knowledge and skills. Learning style is a very essential learning modality, human beings with all the advantages they have are able to adapt and gain the latest knowledge and information by seeing, hearing and doing others doing it [16]. If the success of student learning is determined through the final value of learning, then the key to achieving it is the ability of students to absorb information. Meanwhile, a person's ability to absorb information depends on his ability to make it happen. By mapping students' abilities based on their learning styles, students' learning behavior changes relatively quickly and have a high level of success [17]. This is because the learning style is a way of human conduct information management process in learning [18].

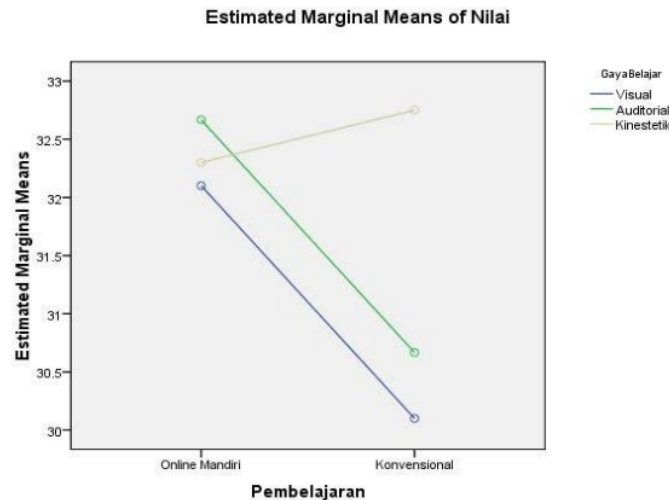
Critical Thinking Ability based on Learning Method

The ability to think critically in this research is defined as the ability of students in identifying concepts, generalizing, analyzing, and problem-solving. In this study, the experimental group whose learning to get online self-help based on Rich Internet Applications (RAI) showed significantly improved critical thinking ability compared to the study group using conventional learning concepts. Implementation of online learning based on Rich Internet Applications (RAI) in this learning leads students in the process of solving problems independently. This provides students with learning experiences on concrete issues, thus growing and training students to think critically. One of the efforts to train students to think critically is to present problems and to give them the opportunity to solve the problem, both at the beginning and at the end of the learning process. An effective learning approach is a learning that in the process provides an independent critical thinking opportunity [19]. In a study conducted by Parwati (2007) who mentions that the development of self-oriented learning oriented and problem-solving successfully develop students' critical and creative thinking skills [20].

Critical Thinking Ability Based on Learning Method and Learning Style

This study shows that learning styles have interaction with the learning treatment used by teachers. This means that learning styles contribute differently to students with different learning behaviors, which meant learning treatment in this study is self-directed online learning based on Rich Internet Applications (RAI) and conventional learning. So the implementation of learning should consider the learning style that is owned by students in class groups. Because each treatment of learning in students has different contributions to different learning styles of students. In the following diagram, it is seen that students with different learning styles have different critical thinking skills.

Diagram 1
The Ability of Critical Thinking to Students with Different Learning Styles



It can be explained that students with visual and auditorial learning styles on independent online learning process based on Rich Internet Applications (RAI) have better critical thinking skills than students with the same learning style but using conventional learning. Students will learn effectively when teachers compromise visual, auditorial and kinesthetic learning styles. However, some studies also mention that not all students are doing well when learning to use both. When it is enforced, students must have better critical thinking skills to better understand the ongoing learning materials [21].

5. Conclusion

Based on the results of data analysis and discussion that has been done, it can be concluded the results of this study; 1). Student learning styles consisting of visual, auditorial and kinesthetic learning styles do not have significant differences in student learning outcomes, 2). Students who are subjected to learning with self-directed online learning based on rich internet application (RAI) have better critical thinking skills, compared to students studying by conventional methods, and 3). In each type of student learning style, both visual, auditorial and kinesthetic have better critical thinking skills when subjected to self-learning online learning based on rich internet application (RAI) than students learning using conventional learning methods.

Based on the conclusions of this study, the researcher gives a summary of suggestions that online self- based learning based on rich internet applications (RAI) gives students better critical thinking skills than conventional learning. On the basis of this, it is advisable for teachers to apply internet-assisted learning so that students are able to explore their curiosity for information and new knowledge. It is also recommended for teachers to consider the different learning styles of students so that the learning objectives can be achieved.

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