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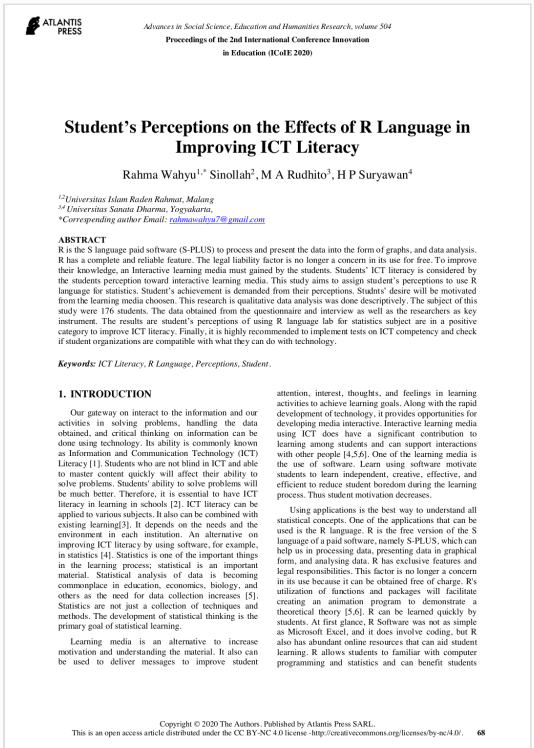

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Student's Perceptions on the Effects of R Language in Improving ICT Literacy

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ABSTRACT
R is the S language paid software (S-PLUS) to process and present the data into the form of graphs, and data analysis. R has a complete and reliable feature. The legal liability factor is no longer a concern in its use for free. To improve their knowledge, an Interactive learning media must gained by the students. Students' ICT literacy is considered by the students perception toward interactive learning media. This study aims to assign student's perceptions to use R language for statistics. Student's achievement is demanded from their perceptions. Studnts' desire will be motivated from the learning media choosen. This research is qualitative data analysis was done descriptively. The subject of this study were 176 students. The data obtained from the questionnaire and interview as well as the researchers as key instrument. The results are student's perceptions of using R language lab for statistics subject are in a positive category to improve ICT literacy. Finally, it is highly recommended to implement tests on ICT competency and check if student organizations are compatible with what they can do with technology.

Keywords: *ICT Literacy, R Language, Perceptions, Student.*

1. INTRODUCTION

Our gateway on interact to the information and our activities in solving problems, handling the data obtained, and critical thinking on information can be done using technology. Its ability is commonly known as Information and Communication Technology (ICT) Literacy [1]. Students who are not blind in ICT and able to master content quickly will affect their ability to solve problems. Students' ability to solve problems will be much better. Therefore, it is essential to have ICT literacy in learning in schools [2]. ICT literacy can be applied to various subjects. It also can be combined with existing learning[3]. It depends on the needs and the environment in each institution. An alternative on improving ICT literacy by using software, for example, in statistics [4]. Statistics is one of the important things in the learning process; statistical is an important material. Statistical analysis of data is becoming commonplace in education, economics, biology, and others as the need for data collection increases [5]. Statistics are not just a collection of techniques and methods. The development of statistical thinking is the primary goal of statistical learning.

Learning media is an alternative to increase motivation and understanding the material. It also can be used to deliver messages to improve student attention, interest, thoughts, and feelings in learning activities to achieve learning goals. Along with the rapid development of technology, it provides opportunities for developing media interactive. Interactive learning media using ICT does have a significant contribution to learning among students and can support interactions with other people [4,5,6]. One of the learning media is the use of software. Learn using software motivate students to learn independent, creative, effective, and efficient to reduce student boredom during the learning process. Thus student motivation decreases.

Using applications is the best way to understand all statistical concepts. One of the applications that can be used is the R language. R is the free version of the S language of a paid software, namely S-PLUS, which can help us in processing data, presenting data in graphical form, and analysing data. R has exclusive features and legal responsibilities. This factor is no longer a concern in its use because it can be obtained free of charge. R's utilization of functions and packages will facilitate creating an animation program to demonstrate a theoretical theory [5,6]. R can be learned quickly by students. At first glance, R Software was not as simple as Microsoft Excel, and it does involve coding, but R also has abundant online resources that can aid student learning. R allows students to familiar with computer programming and statistics and can benefit students

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who are also looking to develop computer skills for their careers [5].

Several studies were conducted to explore students' perceptions [7], some of them in students [8] teacher trainees, and in-service teachers [9]. Recent studies based on statistical results which is show an increment in online learning [10]. Previous research on e-learning has shown that access to online learning supports educational success and student cognitive and affective development. Considering students 'perceptions of interactive learning media is crucial in developing students' ICT literacy [10]. ICT literacy comprises 21st-century forms, where researching and communicating information through a digital environment is as essential as reading and writing in previous centuries[1]. The use of ICT in the classroom has a positive effect on student motivation and interest, which resulted an increasing attention and better behaviour [11]. However, it does not automatically improve learning outcomes [11–13]. ICT literacy distinguishes three dimensions, they are: the ability to use digital technology, attitudes to using technology, and knowledge about technology [14], [15]. The aimed to describe the perceptions of students in using R language. Students' perceptions are closely related to their achievement. Learning media, following the wishes of students will be motivated.

2. METHOD

The method used is the descriptive one[16]. Technique using in collecting data are observation, interviews, and documentation. Purposive sampling was used during the process of selecting informants by several students. The data validity technique uses source triangulation techniques and data analysis methods, starting from data collection, data reduction, data presentation, and verification. The research subjects were high school students, amounting to 176 students. The percentage distribution (%) was used to analyze the data. The ICT literacy used is modified from seven performance areas, which represent problem-solving and important critical thinking aspects of ICT literacy skills[1]. Indicators of ICT literacy can be seen in Table 1.

Table 1. ICT literacy indicator with using R language

Variable	Dimension	Indicator
ICT Literacy	Knowledge of R language	a. Know R language b. Know the essential menu on R language c. can help in visualization
	Relevant skills to use R language	a. are able to use R language menu b. are able to access R language c. are able to take advantage the basic services in the R language d. are using R language to improve critical thinking, creativity, and innovation in work.
	Attitudes on using technology	a. are able to use R language for an individual or group. b. Use R language responsibly. c. Are able to understand the effect of using technology.

Indicators of ICT literacy will be develop such that perform a questionnaires and it distribute to students who already use the R language. The questionnaire consisted of 18 questions. Based on the questionnaire, we saw how the student responded to the use of the R language and whether their ICT literacy increases after study with the R language help.

3. RESULT

The filled questionnaire result from 176 students.

Table 2. Students' Questionnaire Result

No	Indicator	Yes	No
1	Do you prefer to use interactive learning media in place of conventional way?	82%	18%
2	Do you know R language software?	7%	93%
3	Is the learning interactive media application useful?	90%	10%
4	Do you interest with R language?	88%	12%
5	Do you interest to the learning interactive mediaq?	86%	14%
6	Do you interest to learn using R language in chemistry?	84%	16%
7	Do you agree that interactive learning media assists to comprehend the substance?	80%	20%

No	Indicator	Yes	No
8	Is learning with R language can help you to understand the chemistry subject?	85%	15%
9	Do you like learning with interactive media?	80%	20%
10	Do you motivate to study chemistry subject by using R language?	85%	15%
11	Whether with your learning interactive media is not important to study in thec class every day?	25%	75%
12	Whether with learning interactive media you can apply the knowledge in everyday life?	60%	40%
13	Do you more interested study with learning using R language?	70%	30%
14	Is the R language making your achievement upgraded in learning?	78%	22%
15	Is the R language making more efficient study?	70%	30%
16	Is there any obstacle in comprehending the material by using R language?	15%	85%
17	Do you like the interactive learning media assignment method?	79%	21%
18	Do you agree if interactive learning media using R language is applied to the Statistics?	80%	20%

Criteria: < 50% not good, 50-70% good and >70% very good.

176 students have given the responds shown by the questionnaires in Table 2, their perception on using R language as interactive learning multimedia is great, worthwhile, attractive and increase students' encouragement. The data above showed that > 80% of students replied by YES categorized with (very good category). There are as unfavourable percentage which is <50% the students answered NO. R language will be privately effective in interactive learning multimedia in the classroom.

From the questionnaire results, interactive learning multimedia is still found obstacle in comprehending the material. The causes such as students lack of ICT skills and not well-known with interactive learning multimedia learning. It can be recommended to develop certain strategies to promote the effective use of technology resources by students and teachers in order to improve and develop ICT literacy[14].

Multimedia-based interactive learning may be entranced everywhere and everytime. The materials may be added from any kind other sources and renew by teachers through internet facilities. The interaction between teachers and students is also facilitated in this lesson [18]. So it is imperative to familiarize students with learning to use interactive learning media, especially in increasing the flexibility of the learning process and the realization of interactive activities between students and teachers. The existence of ICT will greatly help students gain a deeper understanding of the subject matter and improve student achievement [19, 20, 21].

4. CONCLUSION

This study concludes that the use of the R language in Statistics has been responded well by students. In this study, ICT literacy skills are classified into three competencies, namely basic skills, application, and ethics. The R language improves students 'ICT literacy and increases students' enthusiasm, motivation, and learning outcomes in Statistics. Students' perceptions show that the highest score obtained in ethical competence, followed by basic competence and, finally, application competency since Application competency relates to the use of applications in learning so it can be recommended to develop certain strategies to promote the effective use of technology resources by students and teachers in order to improve and develop these types of ICT competencies. Lastly, it recommended implementing tests on ICT Competence and checking whether what students believe matches what they can do with technology. So, personal trust is essential but not sufficient to be sure about their skills and knowledge. So, this remains as future work to be done in these universities.

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