E-learning in Sains Learning: A-Review of Literature

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Abstract. Developments in information technology encourage changes in various sectors of human life, not least in the world of education. Information and communication technology is a tool to improve the quality of education. This study discusses e-learning in physics learning in terms of the characteristics, and opportunities of e-learning to support 21st century skills. This article examines 20 articles on physics learning using e-learning which is presented in references in the 2017 to 2019 period and analyzed using this method content analysis. It was found that this study was conducted in both high school and university and the results of learning by implementing e-learning were able to meet the diverse needs of students, very effective in helping students improve motivation, learning experience and learning outcomes better than conventional learning methods. And provide opportunities to improve 21st century skills.

1. Introduction
One of the real challenges of education in the era of globalization is to be able to produce human resources who have complete competence, known as 21st century competence. The main competencies that students must have in order to be able to take part in real life in the 21st century. Important skills in the 21st century include learning to know, learning to do, learning to be and learning to live together. Each of these four principles contains specific skills that need to be empowered in learning activities, such as critical thinking skills, problem solving, scientific literacy, and communication skills. Achieving 21st century skills can only be done by updating the quality of learning, helping students develop participation, and personalizing learning. To prepare it all, of course, a new paradigm is needed in the learning process in the classroom. Along with the development of information technology, a new trend in the world of education is to use computers in the learning process. Computers allow learning to be more flexible and able to serve individual students. One of the uses of computer and internet technology is a learning system through electronic learning or better known as e-learning. E-learning is a popular information technology that has been the focus of educational research over the last decade (Sucheta V. Kolekar1 & Radhika M. Pai1 & Manohara Pai MM1, 2018, Mohammed Simko Abdullah 1, Mehmet Toucan 1*, 2017, Lyubov Alekseevna Krasnova and Viktor Yurjevich Shurygin, 2020, I Kadek Suartama, (2020), e-learning is used at all levels of education from elementary to university levels, Sucheta V. Kolekar, Radhika M. Pai*, Manohara Pai MM(2020), Lyubov Alekseevna Krasnova and Viktor Yurjevich Shurygin*(2020), D Mulhayatiah1*, A Kindi1, Y Dirgantara(2018). So this study focuses on the use of e-learning in learning, and looks for answers to what are the characteristics of e-learning, and what opportunities can be taken. In e-learning studies?
2. Literature Review

The development of technology, especially in the field of information and communication in the 21st century, has had a significant influence on educational services. Currently we are in an increasingly competitive era, it takes careful preparation to form superior human resources. An important component in turning challenges into opportunities is to continue to practice developing yourself, learning new skills that suit the needs of today's students. The skills most needed today are cultural competence skills and mastery of technology.

According to Horton in Ramadhani (2012) e-learning is any utilization or use of the internet and web technology to create a learning experience. E-learning can be seen as an innovative approach to design a good delivery medium, user-centered, interactive and as an open, flexible and distributed learning environment.

E-learning according to Oetomo in Darmawan (2014) is a concept in an effort to integrate traditional learning processes (traditional learning), distance learning (distance learning), and learning that combines various learning models (blended learning), which combines various learning models that aimed at optimizing learning processes and services both remote, traditional, mediated, and even computer-based. Students who study can take advantage of online teaching materials, facilities, then print and download and study classical both in class and outside of class, after that they discuss with the help of print, electronic, and online media.

3. Method

The type of research used is the content analysis method. Content analysis is a research that is an in-depth discussion of the content of a pre-existing article. Research data collection is done by searching for articles contained in online journals, using Google Cedekia. The keyword used by the researcher in searching the article is "e-learning", in science learning.

From a search using the keywords "e-learning" and "science learning" several articles were obtained and then selected articles that met the criteria for e-learning and science learning. Then a descriptive qualitative data analysis was carried out to see the characteristics of e-learning used in science learning.

4. Results and Discussion

The research results obtained 20 relevant articles, then analyzed and synthesized because the data from the research reports were still very broad, so only 10 relevant articles were taken. The data of the article were processed by summarizing and determining the essence of the research results. Then the data is reported back by means of qualitative and quantitative descriptions. The data from the analysis of the characteristics of e-learning can be seen as follows:

| NO | Author                                                                 | Year | Study                | Subject            | Result                                                                 |
|----|------------------------------------------------------------------------|------|---------------------|--------------------|------------------------------------------------------------------------|
| 1  | Sucheta V. Kolekar, Radhika M. Pai*, Manohara Pai M.M.                 | 2018 | e-learning          | College student    | Effectively improve learning style and learning experience             |
|    |                                                                        |      | -learning style     |                    |                                                                        |
| 2  | Mohammed Simko Abdullah 1, Mehmet Toycan 1*                            | 2017 | e-learning – learning | College student    | Efektif meningkatkan hasil belajar                                    |
|    |                                                                        |      | outcome             |                    |                                                                        |
3  Lyubov Alekseevna Krasnova and Viktor Yurjevich Shurygin*  2020  e-learning—physics teacher professionalism  physics teacher  Effectively improve the competence of physics teachers in terms of teaching methods

4  I Kadek Suartama  2020  E-learning development  High School  e-learning is very good for use in the learning process

5  D Mulhayatiah1*, A Kindi1, Y Dirgantara  2018  e-learning—problem solving skills  High School  Effectively improve problem solving skills

6  Garry Falloon  2019  e-learning—learning, achievement, and group collaboration  College student  Effectively improve cooperative learning

7  Abdullah AlhabibSeubah, Jennifer Rowleyb,*  2019  e-learning—learning effectiveness  High School  Effectively improve learning activities

8  Ahmad Alshehri, MalcolmRutter, Sally Smith  2019  E-learning design – motivation to learn  High School  E-learning design increases students' learning motivation

9  Ching-Huei Chen  2014  e-learning—learning motivation  High School  Effectively increase learning motivation

10  Che Ahmad Azlan, PhD1 , Jeannie Hsiu Ding Wong, PhD1*, Li Kuo Tan, PhD1, Muhammad Shahrun Nizam AD Huri, MMedPhys1, Ngie Min Ung, PhD2, Vinod  2020  e-learning – learning activities  College student  Effectively improve learning activities
Based on the results of the study, it was found that e-learning is very effective in helping the learning process in the classroom, e-learning is not a substitute for teachers or tutors, but as a medium that can improve the shortcomings of the classical learning process, e-learning is quite effective in increasing learning, motivation, adapting style diverse student learning, and make the learning process student-oriented, so it is hoped that the development of e-learning can be used as a vehicle for developing 21st century skills for students. The results showed that there were no research results linking e-learning with 21st century skill variables, especially scientific literacy skills. This is a gap and the basis for further research on applied physics courses.

5. Recommendations
Based on the literature review, there are recommendations regarding the use of e-learning in classroom learning.

- E-learning is able to meet the diverse needs of students, so that the nature of student-centered science learning can run well.
- the ease of using e-learning can increase students' motivation and learning activities
- Based on the literature review, research is still rare to measure the effect of e-learning on 21st century skills, especially regarding scientific literacy. Therefore, further research is expected to be able to test the effectiveness and influence of the application of e-learning on students' scientific literacy skills

6. Conclusion and Suggestion
Based on the literature review above, it can be concluded that the use of e-learning in learning has a positive effect on learning in the classroom. E-learning is able to meet the diverse needs of students, increasing activities and learning outcomes.

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