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# Developing Elementary Science Online Learning Content Using Schoology

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**Abstract:** The development of science and technology can make students interested in participating in the learning process so that it can increase student competence. The reality in the field is that there are still many teachers who have not used schoolology-based online learning because of a lack of information. Teachers are less creative in developing teaching materials that suit the characteristics of students. This research began when researchers discovered gaps in conditions in the field that teachers were still not using technology enough, so that learning was less varied. The aim of the research is to produce online learning content using Schoology in elementary school science learning that is practical, valid and effective to increase student competence. The research uses the ADDIE model which consists of analyze, design, development, implementation, and evaluation. This research produces online elementary science learning content using schoology. The results of the research show that based on the expert assessment of the material, language and media the learning content developed was declared valid, practical based on the responses of students and teachers, and effective in increasing students' competence.

**Keyword:** Online learning; Schoology; Science learning; Students' competence

## Introduction

Education has a very important role in facing current technological advances. The presence of the internet has shifted conventional views in teaching and learning activities (Burmistrova & Makoelle, 2023; Mhlongo et al., 2023). The widespread use of the internet has great potential in developing learning media with online systems (Haleem et al., 2022; Asaqli, 2020). As times progress so rapidly, learning methods have also experienced many changes and developments, both learning methods, learning media, and learning processes. The concept of elementary science education is one of the main subjects that plays an important role in the advancement of science and technology at the elementary level (Widiyatmoko & Shimizu, 2018; Umardianti et al., 2023). In reality, students' critical thinking abilities in science and physics learning are not as expected. The low critical thinking ability in science and physics learning is because learning activities are still conventional and students are rarely trained to solve problems (Umardianti et al., 2023; Purba et al., 2021).

The form of use of information technology applied in the world of education is electronic learning (e-learning) (Alyoussef, 2023; Hikmawan et al., 2019). Other terms for e-learning are online learning, virtual learning, distributed learning, virtual class or web-based learning. E-learning platforms that are widely used include Edmodo, Schoology, Moodle, Quipper School, Dokeos, and dotLRN. Another similar e-learning method, Schoology, has the same concept as Edmodo and supports almost all the facilities supported by

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Edmodo. The advantage of using e-learning is that students are required to be more active compared to conventional learning, where students are given space to study independently so that students can hone their own abilities. The reality in the field is that there are still many teachers who have not used schoolology-based online learning because of a lack of information. Teachers are less creative in developing teaching materials that suit the characteristics of students. The teaching materials used by teachers tend to be teaching materials that are already available, without paying attention to the characteristics and subject matter (Usmeldi & Amini, 2022). Based on observations at SDN 20 Kurao Padang on January 28 2020. Researchers found a problem where the school already had computer facilities and a WiFi network, but its use had not been maximized and was only used by high class students. So, there is a need for a solution to this problem.

Currently developing technology provides facilities that make it easier for teachers to organize, design and implement learning (Mpuangnan, 2024; Nguyen et al., 2022). Through a Learning Management System (LMS) which provides interesting learning activities so that the learning process is more popular with students (Maslov et al., 2021). Schoology is a site that combines social networking and LMS. So with Schoology we can interact socially and learn at the same time. However, in supporting online learning, schoology provides many resource options, can accommodate types of questions (question bank), availability of attendance facilities, messages and analytics (DeCoito et al., 2022). With the rapid development of technology, Edmodo learning, which can only be used by teachers, students and parents, is developing by involving the active role of lecturers at universities, the feature is called Schoology (Guo et al., 2019).

The features of schoology are Courses, Groups, Resources (Learning Resources). The advantages of Schoology are that it can improve learning achievement, get positive responses, increase learning activities, and can increase learning independence (Darma et al., 2021; Emita et al., 2022). Furthermore, the advantage of this online schoolology media is that students can access learning easily from virtually anywhere with internet access, students can save time and transportation costs without having to travel to the learning location (Garlinska et al., 2023; Palvia et al., 2018; Paul & Jefferson, 2019). The aim of this research is to produce online learning content using school science in elementary school science learning that is practical, valid and effective for increasing student competence.

## Method

This research uses ADDIE model development research which consists of five stages, namely analysis, design, develop, implement and evaluate (Slavit et al., 2016). The analysis stage includes: needs assessment, identification of goals, tasks, context, objectives, and skills analysis. The Design Stage includes: development of objectives, test items, and learning strategies. The Development Stage includes the preparation of teaching materials. The Implementation stage includes activities to support the delivery of instructions. Tahap Evaluation mencakup: evaluasi formatif dan evaluasi sumatif. Product trials were carried out on grade 2 students at State Elementary School 20 Kurao Pagang, Padang. Research instruments include observation sheets, interview guides, questionnaires and learning outcomes tests. The data analysis technique is a descriptive analysis technique to determine the validity, practicality and effectiveness of the product being developed.

## Result and Discussion

The results of the Analyze stage are Title and Author Details: Front end analysis; This analysis was carried out based on the results of observations at SDN 20 Kurao Padang on January 28 2020. Researchers found a problem where the school already had computer facilities and a WiFi network, but its use had not been maximized and was only used by high class students; Analysis of student characteristics; Class II students are in the age range of 7-9 years, who still enjoy playing and like concrete objects and have an active psychomotor level.; Concept Analysis; In SBdP learning, Basic Competency 3.2 understands simple rhythm patterns through children's songs. KD 4.2 Showing simple rhythm patterns through children's songs.

In KD 3.4 learning, get to know vocabulary and concepts about healthy environments and unhealthy environments in the surrounding environment as well as how to maintain environmental health in Indonesian or regional languages through written, spoken and visual texts. KD 4.4 Presents the correct use of Indonesian vocabulary or regional languages as a result of observations about healthy and unhealthy environments in the surrounding environment as well as ways to maintain environmental health in the form of written, spoken and visual texts. KD 3.9 Explain line segments using concrete models of flat shapes and spatial shapes. KD 4.9 Identify line segments using plane shapes and space shapes; Formulation of learning objectives; The learning objectives derived from the indicators carried out by researchers are: By listening to examples from the teacher, students can differentiate

long and short sounds in children's songs using symbols correctly; By imitating the teacher's example, students can play the long and short sounds in children's songs correctly; With questions and answers, students can state the contents of the text they read relating to a healthy environment using spoken language correctly; With assignments, students can record the contents of texts related to a healthy environment using written language correctly; By observing the picture, students can determine the line segments that limit the flat shape model correctly; With the assignment, students can identify the line segments that limit the flat shape model correctly. The results of the Design stage are product development steps, namely:

*Create a schoology account as a teacher by opening the website www.schoology.com on Google search*


**Figure 1.** Initial appearance of the website

*Create a class in schoology by selecting course on the tab bar, then clicking create class. After that, fill in the class identity*

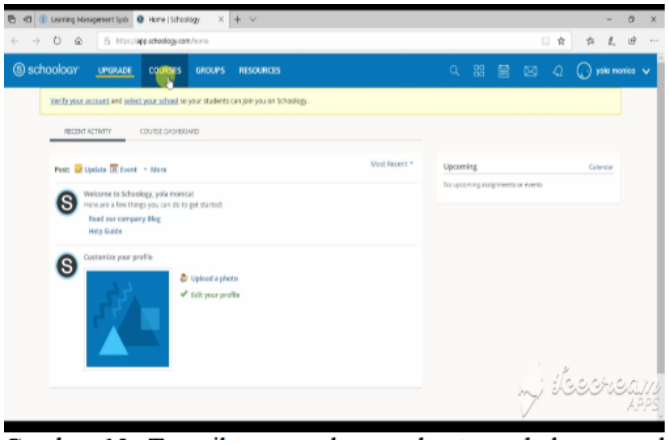


**Figure 2.** Initial view of class creation

*Develop and design learning materials in schoolology classes, by clicking on the addpage to write down core competencies, basic competencies and learning materials*

**Figure 3.** View of designing KI


**Figure 4.** Final view of KI

*Add a learning video by clicking add media / link*

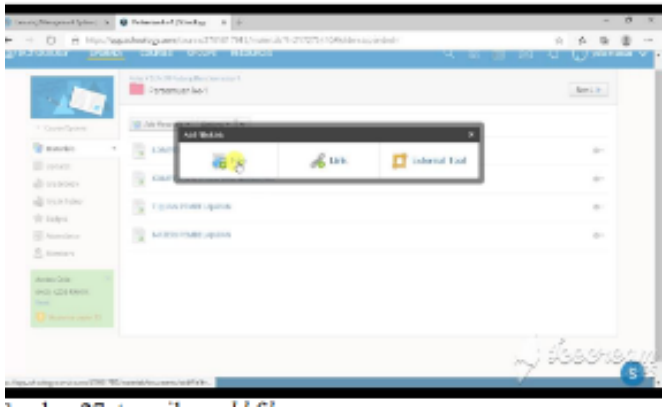

**Figure 5.** Add file display

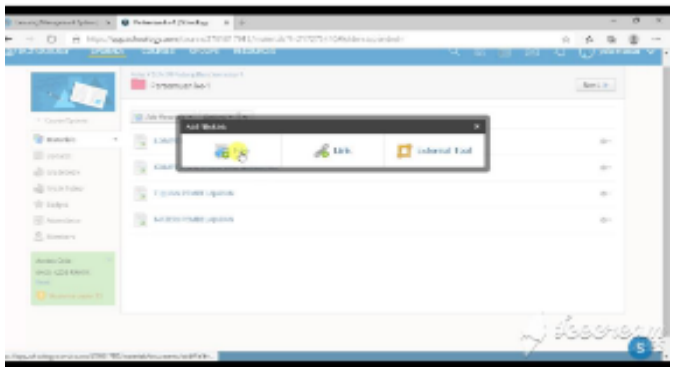

**Figure 6.** Display of the uploaded video

*Create an assignment by clicking Add Assignment*

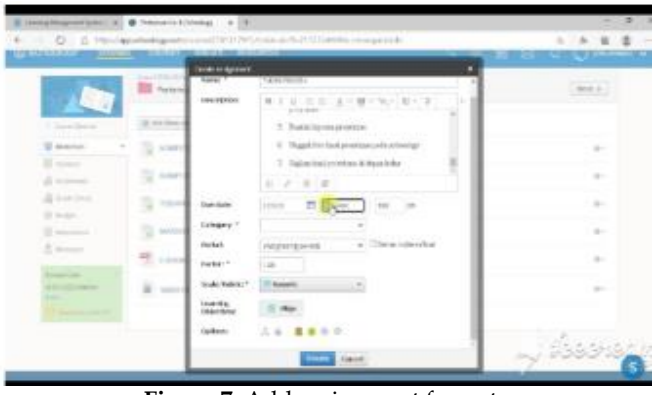

**Figure 7.** Add assignment format

*Create a quiz by clicking add assignment*

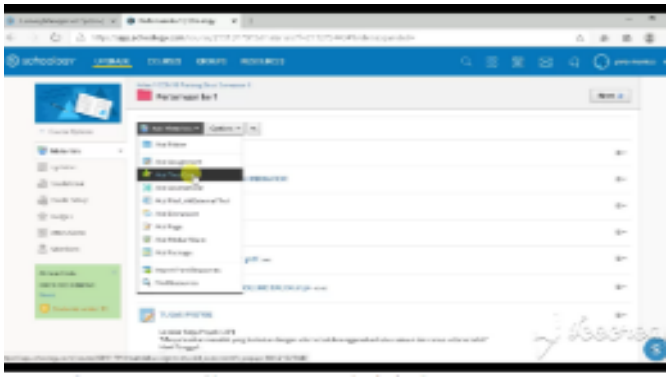

**Figure 8.** Display of the add quiz menu

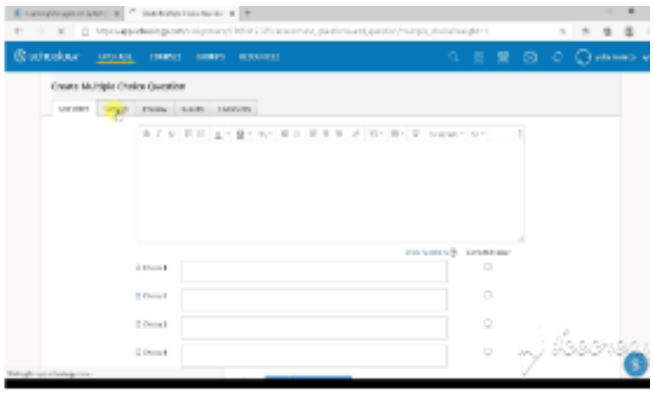

**Figure 9.** Question format

The results of the Development stage are validation of the product by 3 validators, namely content or material validation, language validation, and media validation.

**Table 1.** The Results of the Three Validations

| Validated aspects | Percentage (%) | Category |
|---|---|---|
| Material | 92.50 | Valid |
| Language | 83.75 | Valid |
| Media | 89.07 | Valid |
| Average | 88.44 | Valid |

The results of the Implementation stage are in the form of product trials on students in the learning process. The practicality test results of student and teacher responses to the product being developed can be seen from table 2.

**Table 2.** Results of Practicality Test of Teacher and Student Responses

| Rated aspect | Percentage (%) | | Category |
|---|---|---|---|
| | Teacher | Student | Practical |
| content and purpose | 90 | 90.50 | |
| Techique | 92 | 91 | Practical |
| instructional learning | 88 | 89.50 | Practical |
| Average | 90 | 90.33 | Practical |

The results of the product effectiveness test in terms of students' learning completeness showed that 80% of students completed their learning. Products can be declared effective based on students' classical learning completeness. Based on the results of the gain score test, it was found that student learning outcomes increased by 57% so that the product was effective enough to be used in learning. Based on the results of the research that has been carried out, we can see that the process of developing elementary science online learning content using schoolology is in accordance with the development model applied. This research uses the ADDIE development model which consists of 5 stages, namely the Analyze, Design, Development, Implementation and Evaluation stages. The ADDIE model was chosen because it has systematic steps and is easy to understand (Spatioti et al., 2022; Al Shloul et al., 2024).

Assessment of online elementary science learning content using schoolology is good and appropriate. The validity test consists of three experts, namely, material experts, language experts and media experts. Based on the validation results, it can be concluded that the SD science online learning content using the developed schoolology can be said to be valid. Practicality data was taken from teacher and student response questionnaires. Based on the results of analysis from teacher and student questionnaires, it is known that this learning content is practical in its application. Based on the research results, we can see that the use of online elementary science learning content using schoolology can have a positive impact on learning and provide benefits, including increasing students' understanding of learning concepts regarding data presentation material (Sundari et al., 2024; Iksan et al., 2022). Elementary science online learning content using schoolology is suitable for use in the learning process because it helps students in learning activities at school and at home (Aziz et al., 2022; Kumar Basak et al., 2018; Rusnilawati et al., 2023).

*Validate Online Elementary Science Learning Content Using Schoology*

Valid is often interpreted as authentic. Verbeij et al. (2021), valid is an assessment of the accuracy of a media being developed. Elementary science online learning content using schoology is declared valid if it meets the specified requirements in terms of both content and construct (Widyastuti & Susiana, 2019). The components of validity must also be related to each other consistently or what is usually called construct validity. Based on the results of validation data analysis by learning content experts, it is classified as valid for use in the learning process.

*Practicality of Online Elementary Science Learning Content Using Scholoogy*

Learning content is said to be practical if teachers and students can apply online elementary science learning content using scholoogy in the learning process well (Zamiri & Esmaeili, 2024; Wardono & Mariani, 2019). Based on the analysis of the practicality test results, the practical category was obtained because students felt enthusiastic about learning activities (Udil, 2020).

*Effectiveness of Online Elementary Science Learning Content Using Scholoogy*

Effectiveness can be achieved if the elementary school science online learning content using schoology is valid and practical (Alokluk, 2018; Wang et al., 2022; Turmuzi & Lu'luilmaknun, 2023). Assessment is used to determine the effectiveness of the learning process after using schoology. Assessment is carried out based on the results of students' pretest and posttest. Based on the results of the students' learning completeness and gain score test data, it proves that online elementary science learning content using schoology is effective for the learning process (Qamarya et al., 2023). The research results show that learning use schoology effectively to improve student learning outcome (Supratman & Purwaningtias, 2018; Qalbi & Sari, 2023; Farizi et al., 2021).

## Conclusion

Based on the results of the research that has been carried out, it can be concluded that: Digital learning developed based on schoolology can make it easier for students to understand learning. Expert validity results with an average percentage of 88.44% are in the valid category so they can be used in the learning process in elementary schools; Digital learning developed based on schoolology can help students understand material concepts. The teacher's practicality test results obtained a percentage of 90% and the students' practicality test results obtained a percentage of 90.33% in the practical category so that it has been declared practical for use in the classroom in teaching and learning activities. Based on the results of the research conducted, researchers suggest the following: For teachers, so that teachers can use learning media in digital classrooms based on schoolology which is declared valid, practical and effective; For other researchers, to be able to develop learning media in digital classrooms based on schoolology in different conditions and scopes as well as as a reference for developing wider media.

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**Author Contributions**

Conceptualization; R. A.; methodology.; I. W.; validation; R. D. S.; formal analysis; U.; investigation.; R. A.; resources; R. A.; data curation: I. W.; writing—original draft preparation. R. D. S.; writing—review and editing: U.; visualization: R. A. All authors have read and agreed to the published version of the manuscript.

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**Conflicts of Interest**

The authors declare no conflict of interest.

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