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# Utilization of Hyperdocs in Online Learning Models on Student Learning Outcomes

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## Abstract

*This study aims to improve student learning outcomes through online learning models by utilizing hyperdocs on buffer solution material in class XI MAN 1 Palu City. This type of research uses a quasi-experiment with a pretest and posttest Group Design. Quantitative descriptive research with mixed methods and sampling by purposive sampling. The sample in this study were students of class XI MIPA 1 as the experimental class and XI MIPA 3 as the control class. The instrument used in this study was a learning achievement test totaling 16 multiple-choice question numbers. The research results were obtained from both classes, namely for the experimental class of 81.14 and the control class of 77.05. Learning outcomes were analyzed by testing the effect size for the experimental class, namely 1.2 (Very Large) and 1.0 (Large) for the control class. Based on the results of the study it can be concluded that the online learning model by utilizing hyperdocs in class XI MAN 1 Palu City students can improve student learning outcomes.*

**Keywords:** Online learning models, hyperdocs, buffer solution materials, learning outcomes

## Introduction

The 2013 curriculum is a new curriculum that is implemented in the education system in Indonesia. By utilizing technology and information, it is hoped that students will start to be active in terms of learning so that the teacher only acts as a facilitator (Cholik, 2017).

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, nation, and state (Sudarsana, 2016).

As an effort to deal with inactive children, students repeat the material obtained or ask questions when they cannot understand the material, an effort made by parents to meet the needs for online learning support (Dewi & Sadjiarto, 2021). E-learning means learning using electronic device assistance services. Some interpret e-learning as a form of distance education carried out via the internet.

Syarifudin (2020) says this form of learning can be done anytime and anywhere without being bound by time and without having to meet face to face. Teachers' adaptation to the implementation of online learning during the Covid-19 pandemic includes gathering information to increase understanding of online learning through internet media such as Google and YouTube and discussing with colleagues. The student learning mastery has also increased after using Google classroom and zoom meetings (Permatasari, 2021). Fanny (2019) said online learning would increase interaction in learning.

Chemistry is part of the natural sciences which is a compulsory subject in high school (SMA), chemistry is a very interesting science to study because chemistry is a science that covers several aspects of chemical substances, and chemistry is not a deadly abstract material. and feared, because chemicals are everyday materials that are handled and even consumed (Yeh et al., 1996).

However, in reality, student achievement in chemistry is still low (Aviana & Hidayah, 2015). The low achievement of students in chemistry studies is influenced by various factors in learning activities, both internal and external factors (Rosa, 2015).

The results of observing data at MAN 1 school in Palu City, in the online chemistry learning process, that so far online learning has been carried out well and smoothly, but most students are not interested in online learning so there are still students who are active and some who are not. active in participating in learning. Almost all students have online learning facilities, namely cell phones, and also get study quotas from the government.

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In general, online learning can overcome various obstacles such as distance, time, cost, and limited teaching resources (Sudiana, 2016). However, there are still some special things that need attention, one of which is the limited number of available applications, especially in the evaluation section at the end of the lesson, so the analysis of the evaluation scheme used is not easy to digest, especially taking into account the quality of the questions. Therefore, a solution is needed in the form of an evaluation application that makes it easier to analyze the instrument (Fuady, 2016).

HyperDocs offers a system for powerful lesson design that guides students through the learning process, with students as the focus of document design. Free access to HyperDoc Systems is available for teachers to create and manage these worksheets. HyperDocs is completely web-based. Teachers will explore using HyperDocs as a pedagogical method by completing content assignments in previously created documents during the semester and designing their HyperDocs around content related to their area of certification (Gaffner, 2019).

According to Yuangga & Sunarsih (2020), online learning models can be used to convey learning without being limited by space and time, can use various sources that are already available on the internet, teaching materials are relatively easy to update and besides that, it increases student independence in the learning process. carried out by (Chaidir, 2021) entitled "Increasing Learning Outcomes and Student Motivation in Online Learning with Google Classroom in Thermochemical Material for Class XI IPA Odd Semester SMA Negeri 2 Tanjungpinang" Student Learning Outcomes in Online Learning with using thermochemical materials in Google Classroom. The results of the study show that using Google Classroom for online learning can increase the impact of student learning. Anjarsari et al. (2021) said that the use of Google Classroom in online learning can improve student learning outcomes. will not happen if students can learn independently.

Research conducted by Pujiasih (2020) entitled Building a golden generation with a variety of online learning during the Covid-19 pandemic. Online learning can be done virtually, in group discussions, providing material in the form of videos, recordings, powerpoints, modules, study sheets, games with quizzes, and online assessments.

Research conducted by Mulatsih (2020) describes the implementation of online chemistry learning activities. Based on questionnaire data from 322 students, the advantages and disadvantages of online learning were obtained, where students who liked learning online at home were 45% and students who were not happy were 55%. The advantages of this learning are that students are more effective in learning, don't get tired quickly, are fun, and have new experiences the drawback is a poor internet connection, students do not understand the material, students feel tired, and students cannot discuss with friends.

Woodyard (2018) says HyperDoc is a series of interactive electronic texts, a kind of central digital hub that allows students to work at their own pace, collaborate, and have multiple opportunities to practice skills through different media. When students work, the teacher can act as a facilitator and go around the class helping and directing as needed. Instead of having students work on the same lesson on the same site during the class period, students can access HyperDoc lessons, which are differentiated and structured (Arizona et al., 2020). For example, students can progress from the shared Google Doc to which they want to add responses, to a nearpod lesson that is defined as a student-led lesson. When finished, the next hyperlink might take them to informational literature or text to read, and then to a short informational video to listen to and view Mastinah (2021).

In the learning process, especially online learning, an appropriate way is needed to provide and convey learning material to students so that students do not bore and continued to continue to pay attention to the material delivered by the teacher (Irawati & Santaria, 2020).

Through this blended learning model, the teacher assesses that students will be more flexible to study material independently by utilizing materials available online, students and teachers can also hold discussions anytime and anywhere. Teachers can also organize quizzes more easily. In addition, learning resources are also unlimited. Students not only master learning material but students also master technology obtained from learning experiences with this model. Therefore, teachers feel that the learning process is more varied, effective, and efficient with this blended learning model because it is considered to make it easier for students to obtain learning during the Covid-19 pandemic.

Based on this background, this study aims to improve student learning outcomes through online learning models by utilizing hyperdocs on buffer solution material in class XI MAN 1 Palu City.

## Method

This type of research is quasi-experimental research (quasi-experiment). According to Sudjana (2006), quasi-experimental research is a type of experimental research in which control over the variables is not carried out strictly or fully and with controllers that are appropriate to the existing conditions. According to Sugiyono (2014), this design has a control group, but cannot fully function to control external variables that affect the implementation of the experiment.

The research design used a pretest-posttest group design, namely the study was conducted twice, namely before the experiment (pretest) and after the experiment (posttest) with one group of subjects (Arikunto, 2010).

The population in this study were all students of class XI IPA MAN 1 Palu City who were registered in the 2020/2021 school year as many as 200 people consisting of 9 classes. The research sample consisted of 2 classes, namely class XI MIPA 1, which consisted of 23 students, and class XI MIPA 3, which consisted of 22 students. The number of students in XI IPA 1 is 9 men and 14 women. The number of XI IPA 3 students was 9 men and 13 women and the instrument used in this study was a learning achievement test totaling 16 multiple choice question numbers.

This research activity was carried out at MAN 1 Palu City, the selected class was class XI MIPA 1 as treatment class 1 which will be given an online learning model using hyper docs-based LKPD, and class XI MIPA 3 as treatment 2 which will be given learning with an online learning model using LKPD. The sampling technique used is purposive sampling (selection based on consideration).

The data used in this study are quantitative and qualitative. Quantitative data is in the form of test data on learning outcomes, and qualitative data is in the form of observational data on the implementation of learning. While the data sources in this study were primary data sources from schools and chemistry teachers in class XI MAN 1 Palu.

The data analysis techniques used are preparation level analysis, implementation level analysis, and final level analysis. In the preparation stage, the analysis is carried out by validating the test and non-test instruments used. Validity is related to the test problem which is intended to measure exactly what is to be measured (Nurgiyantoro, 2001). In the implementation analysis stage, test analysis and analysis of the results of the observation sheet were carried out. In the final analysis, the normality test, homogeneity test, hypothesis test, and effect size test were carried out.

## Result and Discussion

The research instrument used to measure the increase in student learning outcomes in chemistry class XI MAN 1 Palu city was the form of a multiple-choice test with a total of 16 multiple-choice questions. Data on chemistry learning outcomes of MAN 1 Palu City students by providing pretest and posttest to the experimental class and control class, the pretest conducted by both classes aims to determine the student's initial conditions before participating in the learning process through hyperdocs with online learning models. The posttest conducted by the two classes aims to determine the extent to which learning through hyperdoc with an online learning model can affect student learning outcomes in the buffer solution material. The description of the data obtained from this study is about student learning outcomes through normality, homogeneity, hypothesis, effect size, and student learning outcomes (posttest).

Teacher activity research data was obtained from observations made by observers or observers. The experimental class and the control class were observed at each meeting. The results of observations of teacher activity are presented in **Table 1.**

**Table 1**. Results of teacher observations

| Meeting | Percentage (%) | |
|---|---|---|
| Teacher activities | Experiment class | Control class |
| Meeting 1 | 91.66 | 86.66 |
| Meeting 2 | 88.33 | 85.00 |
| Meeting 3 | 91.66 | 85.00 |
| Average value | 90.55 | 85.55 |

Student activity assessment data was obtained through observations made by observers (observers). Observations were made in the experimental class and control class at each meeting using observation sheets. The results of observations of student activity are presented in **Table 2**.

**Table 2**. Student observation results

| Meeting | Percentage (%) | |
|---|---|---|
| Students Activity | Experiment class | Control class |
| Meeting 1 | 90.00 | 86.60 |
| Meeting 2 | 90.00 | 85.00 |
| Meeting 3 | 88.33 | 85.00 |
| Average value | 89.44 | 85.53 |

According to Cohen (1988) In general, student learning outcomes were obtained from cognitive observation sheet data.

**Table 3.** Pretest student learning outcomes assessment

| Essay | Pretest | |
|---|---|---|
| | Experiment class | Control class |
| Sample | 23.00 | 22.00 |
| Lowest value | 18.75 | 12.50 |
| Highest value | 43.75 | 37.50 |
| Average value | 30.70 | 24.71 |
| Standard deviation | 7.27 | 8.29 |

***Test the normality of student learning outcomes data***

a) The normality test of the experimental class was obtained: The value $\chi^2_{count} < \chi^2_{table}$, = **5.87<7.81** which indicates the data obtained is normally distributed.
b) The normality test for the control class was the value of $\chi^2_{count} < \chi^2_{table}$, is **5.86< 5.99** which indicates the data obtained is normally distributed which shows the data obtained are normally distributed

One of the conditions in the homogeneity test states that the difference between the two classes taken as a sample must be homogeneous, namely by conducting an F test (similarity of twovariables).

Based on the hypothesis in this study, whether or not there is an influence on student learning outcomes in classes that are given an online learning model using hyperdocs is better than a class given an online learning model without using hyperdocs on the buffer solution material for class XI MAN 1 Palu City.

**Table 4**. Posttest student learning outcomes assessment

| Essay | Posttest | |
|---|---|---|
| | Experiment class | Control class |
| Sample | 23 | 22 |
| Lowest value | 75 | 68.75 |
| Highest value | 93.75 | 81.25 |
| **Average value** | 81.68 | 77.05 |
| Standard deviation | 5.96 | 5.30 |

Before the t-test, the prerequisite tests are:

### *Learning outcomes*

The test criteria are to reject $H_o$ if $t_{count} > t_{table}$, where t (1-α) is obtained from the distribution list t with dk = $(n_1 + n_2 – 2)$ and probability (1-α). For other t values, $H_1$ is accepted. It turns out that $t_{count} > t_{table}$ which is 1.85 > 1.67 then $H_o$ is rejected and$H_1$ is accepted. This is because the value of $t_{count}$ isin the rejection area of $H_o$, with a significant level (α) = 0.05 and dk = 43. So it can be concluded that the blended learning model can improve student learning outcomes.

Through the calculation of research data on individual and per-class student learning outcomes, in the experimental class, there are 23 students for the effect size per class, in the experimental class 21 students are in the mediumcategory and 2 students are in the small category for the effect size per class, which is 0.7 in the large category, and in the control class There are 22 students for effect size per class, 16 students are in the medium category and 6 students are in the small category for effect sizeper class, which is 0.5 in the medium category. For the overall effect size value in the two classes, the experimental class is 0.72 (large category) and the control class is 0.5 (medium category). So it can be said that the blended learning model has a great influence on the learning outcomes of class XI MAN 1 Palu students on the buffer solution material.

This study uses teacher and student observation sheets to assess the implementation ofthe stages of the learning model used in the experimental class and control class at each meeting. Based on the results of observations obtained that overall teacher activities have been going well and getting good responses from students. The presentation of average value ofthe teacher's activity shows an increase.

In the buffer solution material, there is a count that it makes students less active in learning by avoiding student inactivity by applying an online learning model based on LKPD hyperdocs with full colors and links so that students are more independent with links to find the literature they need, with hyperdocs then The activity of the experimental class students who used the online learning model based on the hyperdocs LKPD gota score of 89.44 which was included in the very good category and the student activity in the control class by applying the online learning model with the LKPD scored 85.53 including the

very good category. And the activity of the experimental class teacher got a score of 90.55 which was included in the very good category andthe control class teacher's activity got a score of 85.55 which was included in the good category.

The results of observation of student activities obtained from the experimental class are different from the control class, where the experimental class is higher than the control class,this is caused by students who are less active withtheir groups, this is caused by students who pay less attention to their responsibilities well in discussions groups and collection of assignments,and students mostly depend on active group friends and participate in their groups.

The learning process carried out is by using online in dealing with the current covid-19 pandemic, namely by combining offline (face-to-face) and online learning. The proportion of learning that is done online is more because the rules of learning must be done online during the covid pandemic.

## Conclusion

Based on the results of data analysis and discussion, it was found that the online learning model on student learning outcomes was seenfrom the data from the effect size test of 0.7 whichwas categorized as large. So it can be concluded that the online learning model using hyperdocs provides great benefits to the learning outcomes of class XI MAN 1 Palu students on the buffer solution material.

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## References

Anjarsari, W., Suchie., & Kamaludin, D. (2021). Implementasi pembelajaran online berbasis project based learning untuk meningkatkan kemandirian belajar siswa. *Jurnal Prisma*, *10*(2), 255-263.

Arikunto, S. (2010). *Prosedur penelitian: Suatu pendekatan praktek*. Jakarta: Rineka Cipta.

Arizona, K., Abidin, Z., & Rumansyah. (2020). Pembelajaran online berbasis proyek salah satu solusi kegiatan belajar mengajar di tengah

pandemi covid-19. *Jurnal Ilmiah Profesi Pendidikan, 5*(1), 64-70.

Aviana, R., & Hidayah, F. F. (2015). Pengaruh tingkat konsentrasi belajar siswa terhadap daya pemahaman materi pada pembelajaran kimia di SMA Negeri 2 Batang. *Jurnal Sains, 03*(01), 30-33.

Chaidir, S. (2021). Meningkatkan hasil dan motivasi belajar siswa pada pembelajaran daring dengan google classroom pada materi termokimia di kelas XI IPA semester ganjil SMA Negeri 2 Tanjungpinang. *Jurnal Zarah, 9*(1), 36-41.

Cholik, C. A. (2017). Pemanfaatan teknologi informasi dan komunikasi untuk meningkatkan pendidikan di Indonesia. *Jurnal Ilmiah Indonesia*, *2*(6), 21-30.

Cohen, J. (1998). Statistical power analysis for the behavioral sciences (second edition). United States: Lawrence Erlbaum Associates.

Dewi, T. A. P., & Sadjiarto, A. (2021). Pelaksanaan pembelajaran daring pada masa pandemi covid-19. *Jurnal Basicedu, 5*(4), 1909-1917.

Fanny, A. M. (2019). Pengaruh pembelajaran e-learning terhadap hasil belajar mahasiswa PGSD pada mata kuliah konsep IPS lanjut. *Jurnal Inventa*, *III*(1), 130–135.

Fuady, M. J. (2016). Pengembangan aplikasi evaluasi pembelajaran online untuk pendidikan jarak jauh. *Jurnal Tekno, 26*(September), 148-154.

Gaffner, J. (2019). Modeling and exploring hyperdocs as a method of instruction. *Proceeding of the Society for Information Technology & Teacher Education International Conference* (pp. 1827-1830). United States: Association for the Advancement of Computing in Education (AACE).

Irawati, R., & Santaria, R. (2020). Persepsi siswa SMAN 1 Palopo terhadap pelaksanaan pembelajaran daring mata pelajaran kimia. *Jurnal Studi Guru dan Pembelajaran*, 3(2), 264-270.

Mastinah. (2021). Penerapan pembelajaran daring terhadap hasil belajar dan kreativitas peserta pelatihan kepemimpinan pengawas masa pandemi covid 19. *EDUTECH: Jurnal Inovasi Pendidikan Berbantuan Teknologi, 1*(2), 140-148.

Mulatsih, B. (2020). Penerapan aplikasi google classroom, google form, quizizz, dalam pembelajaran kimia di masa pandemi covid-19. *Ideguru: Jurnal Karya Ilmiah Guru*, *5*(1), 16-26.

Nurgiyantoro, B. (2001). *Penilaian dalam pengajaran bahasa dan sastra*. Yogjakarta: BPFE.

Permatasari, M. I. (2021). Implementasi pembelajaran kimia berbasis daring (google classroom dan cloud meeting) di SMK Negeri 1 Tanjung Palas. *EDUTECH: Jurnal Inovasi Pendidikan Berbantuan Teknologi, 1*(2), 154-161.

Pujiasih, E. (2020). Membangun generasi emas dengan variasi pembelajaran online di masa pandemi covid-19. *Ideguru*: *Jurnal Karya Ilmiah Guru*, *5*(1), 42-48.

Rosa, N. M. (2015). Pengaruh sikap pada mata pelajaran kimia dan konsep diri terhadap prestasi belajar kimia. *Jurnal Formatif, 2*(3), 218-226.

Sudarsana, I. K. (2016). Pemikiran tokoh pendidikan dalam buku lifelong learning: policies, practices, and programs (perspektif peningkatan mutu pendidikan di Indonesia). *Jurnal Penjaminan Mutu*, *2*(2), 44–53.

Sudiana, R. (2016). Efektifitas penggunaan learning management system berbasis online. *Jurnal Penelitian dan Pembelajaran Matematika*, *9*(2), 201–209.

Sudjana, N. (2006). *Penelitian hasil proses belajar mengajar.* Bandung: Remaja Rosdakarya.

Sugiyono. (2014). *Metode penelitian kuantitatif dan kualitatif dan R & D.* Bandung: Alfabeta.

Syarifudin, A. S (2020). Impelementasi pembelajaran daring untuk meningkatkan mutu pendidikan sebagai dampak diterapkannya social distancing. *Jurnal Pendidikan Bahasa dan Sastra Indonesia, 5*(1), 31-34.

Woodyard, J. (2018). *21st century literacy professional development a full-day digital media and technology workshop for middle school language arts.* Retrieved May 10, 2022, from California State University San Marcos, Web site: https://scholarworks.calstate.edu/downloads/j9602108j.

Yeh, P. J., Chen, B. H., Lai, M. C., & Yuan, S. M. (1996). Synchronous navigation control for distance learning on the web. *Computer Networks and ISDN System*, *28*(7), 1207-1218.

Yuangga, K. D., & Sunarsih, D. (2020). Pengembangan media dan strategi pembelajaran untuk mengatasi permasalahan pembelajaran jarak jauh di pandemi covid-19. *Jurnal Guru Kita*, *4*(3), 51-58.