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The Effect of Using Edpuzzle-Based Video in Electrolyte and Nonelectrolyte Solutions Learning on Student Learning Outcomes

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Abstract
The limitation learning media causes the learning of electrolyte and nonelectrolyte solutions to be less interesting and effective in SMAN 1 Kalasan. Therefore, learning can be supported by attractive video design in the form of Edpuzzle which has the potential to build better learning processes and outcomes. This research aims to evaluate the effect of Edpuzzle-based video implementation in electrolyte and nonelectrolyte solutions lessons on student learning outcomes. In form of a Quasi-Experimental Design, this research was carried out by One-Group Pretest-Posttest Design. The research sample is students of 10th grade MIPA 2 that selected by simple random sampling. The instruments used were validation sheets, lesson plans, pretest, and posttest items, questions in Edpuzzle video, an observation sheet of Edpuzzle-based video implementation, and a students' response questionnaire. Research data were analyzed by SPSS 25, Aiken's Statistics, and descriptively. The results showed that using Edpuzzle-based video had an influence on students' learning outcomes that support by Sig value. (2-tailed) < 0.05 and the average of N-Gain is 0.8 (high). The average post-test is 96.7 (excellent). During Edpuzzle video implementation on learning, the cognitive achievement of C1, C2, and C3 respectively level completed are 100%, 100%, and 91.66%, while, C4 and C5 are respectively 22.22% and 41.66%, In addition, the achievement of learning outcomes indicator is also supported by observation for psychomotor and affective domains, with average scores 96.06% and 95.48% respectively. Edpuzzle-based video can be used to support electrolyte and nonelectrolyte learning in senior high school.

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INTRODUCTION

Chemistry is one of the branches of science that includes a variety of abstract terms and concepts that make chemistry often considered difficult. Chemistry learning activities can be stopped if chemistry terms and concepts cannot be understood correctly (Sunyono *et al*., 2009). Research conducted by Lukman (2015) about the learning outcomes of students in chemistry lessons are still relatively low. This can happen probably because the characteristics of chemistry itself seem abstract and complex, so many students are not interested in deepening chemistry. Learners find it difficult to compare the knowledge gained with what is encountered in everyday events. This causes the main concepts that are expected to be achieved to be unattainable. In other words, the learning process still does not reach the learning objectives.

One of the chemical materials studied by 10th grade students is electrolyte and nonelectrolyte solutions. Rahmawati (2018) states that electrolyte and nonelectrolyte solution materials are materials capable of covering conceptual, factual and procedural. Some parts in the conceptual that combine macroscopic, microscopic, and symbolic aspects sometimes make students feel

difficult. Students need to observe the phenomenon and identify it, explain the ionization process microscopically and relate it to the conductivity of the solution symbolically and the challenge of conceptual understanding of electrolyte and nonelectrolyte solutions (Herda dkk., 2014). Understanding of these three representations will be maximized if supported by good visualization, one of which can be through the use of learning videos. As one of the audio-visual media, learning videos are able to present subject matter, information, explain concepts and teach skills to students in the form of images and sounds. Further, Syamsidah (2018) states that learning videos can attract attention that can stimulate the attention of students, demonstrations that are difficult to prepare and record in advance, so that at teaching time, teachers can focus students' attention on the presentation, save time and recordings can be played over and over again.

Based on the results of an interview that has been conducted with one of the chemistry teachers at SMAN 1 Kalasan, information was obtained that the average daily test (UH) scores of students on electrolyte and nonelectrolyte solution topic in the 2020/2021 school year are still below minimum completeness criteria (KKM), namely 75. Teachers assess that students' understanding in the representation of macroscopic, microscopic, and symbolic aspects has not been maximized. In addition, online learning is carried out only using media in the form of Microsoft Power Point (PPT) and learning videos from YouTube, as well as a lack of students-centered learning. One alternative that can be offered to solve this problem is the use of Edpuzzle-based learning videos. This audio-visual website-based learning media is able to make the learning process more interesting. Teachers can see students' ability to understand conceptual representations and questions inserted in learning videos (Amaliah, 2020).

METHOD

This research is a quantitative study with Quasi-Experimental: One-Group Pretest-Posttest Design (Creswell, 2015). Samples selected through simple random sampling technique. This research only involved one group called the experimental class, 10th grade MIPA 2 class at SMAN 1 Kalasan. The treatment given to the experimental class was in the form of using Edpuzzle-based electrolyte and nonelectrolyte learning video. In addition to referring to the Lesson Plan (RPP) which was carried out as many as 2 meetings, the instruments used in this study were in the form of pretest and posttest questions, question items in the Edpuzzle video, observation sheet, and students' response questionnaire. The data analysis technique in this study uses SPSS 25 to test hypotheses, Aiken's Statistical V to calculate the validity of all question items, and descriptive to analyze the observation results and responses of students.

RESULTS AND DISCUSSION

Validation of Edpuzzle-Based Learning Video

Edpuzzle video validation results are based on the assessment of 3 validators. The validity assessment component of Edpuzzle video consists of 4 aspects, namely clarity (2 statements), material quality (3 statements), material systematics (1 statement), and language and typography (2 statements). Validation results can be seen in Table 1. It was obtained that the average validity of the video was 86.45%, so this product is included in the excellent validity criteria because the average percentage is above 85.01 (Akbar, 2013).

Table 1. Edpuzzle-Based Learning Video Validation Results

Aspects	Average (%)	Criteria
Clarity	91,66	Excellent Validity
Quality of content	86,11	Excellent Validity
Systematics of the content	83,33	Good Validity
Language and typography	83,33	Good Validity
Average	86,45	Excellent Validity

Lesson Plan (RPP), Observation Sheets, and Response Questionnaires Validation Results

Lesson plans (RPP), observation sheet, and response questionnaire are each validated based on aspects of format (3 statements), content (4 statements) and language and writing (3 statements). Validation results can be seen in Table 2.

Table 2. Lesson Plan (RPP), Observation Sheet, and Response Questionnaire Validation Results

Instrument	Average of Percentage (%)	Criteria
Lesson plan (RPP)	89.16	Excellent validity
Observation sheet	93.33	Excellent validity
Response questionnaire	87.12	Excellent validity

Based on Table 2, the average percentage of validity of RPP, observation sheet, and response questionnaire has been more than 85.01%, so all three are categorized as very valid and suitable for use.

Test Item Validation Results

The question items were developed for pretests, posttests, and Edpuzzle-based learning videos that refer to KD 3.8 electrolyte and nonelectrolyte solutions in the 10^{th} grade High School Chemistry Syllabus Curriculum 2013. Pretest and posttest contain 10 items of multiple choice questions, while Edpuzzle-based learning videos contain 5 points of description questions. The question items are assessed in 5 aspects, namely the aspect of clarity (2 items of statements), relevance (1 item of statement), validity of content (1 item of statement), no bias (2 items of statement), and accuracy of language (3 items of statement). The results of the validation of the question items are shown in Tables 3 and 4.

Table 3. Item Validation Results for Pretest and Posttest Questions

Item of test	Average of Aiken Validity Coefficient	Criteria
1	0.75	Good validity
2	0.93	Excellent validity
3	0.92	Excellent validity
4	0.79	Good validity
5	0.79	Good validity
6	0.78	Good validity
7	0.88	Excellent validity
8	0.80	Excellent validity
9	0.89	Excellent validity
10	0.90	Excellent validity

Based on Table 3, question items number 1, 4, 5, and 6 fall into the valid category. Meanwhile, question items number 2,3, 7, 8, 9, and 10 are classified as very valid. All of these questions are worth testing.

Based on Table 4, all question items are classified as very valid and worthy of trial. Aiken's coefficient $V > 0.8$ includes very valid criteria (Retnawati, 2016).

Table 4. Validation Results of Problem Items in Edpuzzle-Based Learning Video

Item of test	Average of Aiken Validity Coefficient	Criteria
1	0.81	Excellent validity
2	0.89	Excellent validity
3	0.89	Excellent validity
4	0.84	Excellent validity
5	0.82	Excellent validity

Electrolyte and NonElectrolyte Solution Learning Using Edpuzzle-Based Video

Learning was carried out during two meetings. Students are asked to create an Edpuzzle account and follow the learning process of electrolyte and nonelectrolyte solutions through Edpuzzle-based video. Students also work on 5 points of description questions. The value of the results of the work on the question items in the Edpuzzle Video can be seen in Table 5.

Table 5. Results of Working on Problem Items in Edpuzzle Video

Students' Code	Score	Students' Code	Score
A1	70	A19	90
A2	70	A20	70
A3	80	A21	75
A4	70	A22	100
A5	80	A23	75
A6	80	A24	80
A7	80	A25	80
A8	90	A26	90
A9	80	A27	100
A10	75	A28	90
A11	65	A29	50
A12	80	A30	90
A13	60	A31	85
A14	90	A32	90
A15	90	A33	75
A16	80	A34	75
A17	80	A35	75
A18	75	A36	75
Average			79.44

Based on Table 5, the average score of students obtained during the work of the question items in the Edpuzzle-based learning video was 79.44 which was included in the high criteria (Riduwan, 2010). There is 1 student who is included in the sufficient criteria, 24 students are included in the high criteria, and 11 students are included in the very high criteria.

Item number 1 asks students to be able to remember the meaning of the ability to conduct electricity. Electrical conductivity is a measure of how strongly a solution can conduct electricity. The value of electrical conductivity is a measure of the total concentration of electrolytes in water (Sofiah *et al*., 2016). Based on the results of the analysis of students' answers, it was obtained that all learners were able to achieve the indicator "understand (C2)". The results of the analysis showed that all students were able to re-explain the meaning of the ability to conduct electricity in accordance with what was expected. The achievement of the indicator of understanding by all learners in question point number 1 is influenced by initial knowledge and logical intelligence. This statement is supported by research conducted by Irawan *et al*., (2016), who found that if students can make good use of initial knowledge in understanding new material, then this will affect the ability to solve problems in the given question items.

Item number 2 asks learners to remember the characteristics of a nonelectrolyte solution. A nonelectrolyte solution is a solution that cannot conduct electric current, since its solutes in the solvent cannot produce ions (do not ionize). In the experiment, it was found with experimental data in the form of a light bulb that does not light up and no gas bubbles arise around the electrodes (Brady, 1999). The results of the analysis of students' answers obtained that as many as 32 students were able to achieve the indicator "understand (C2)". Students with codes A2, A13, A20, and A29 described incomplete answer results. Students only explain that a non-electrolyte solution is a solution that cannot conduct electric current. The results of the analysis showed that as many as 32 students were able to achieve the "understand (C2)" indicator.

Furthermore, in question point number 3 in the video Edpuzzle interprets the learning outcome indicator, namely "applying (C3)". In this case, students are expected to show the relationship between the observed phenomenon and what is studied by comparing the two things (Hamdani, 2010:151). Item number 3 asks students to be able to analyze the relationship between the phenomenon of lights on and gas bubbles in the table salt solution with the degree of ionization. A salt solution is a strong electrolyte solution that has a strong electric current conductivity that causes the light bulb to light up and gas bubbles to arise around the electrode. The degree of ionization (α) is the quotient of the total number of electrolyte molecules ionized into ions. That is, this degree of ionization indicates the number of molecules of the electrolyte compound that turn into ions. The strong electrolyte has an ionization degree of 1 (α=1), which means that the salt solution is perfectly ionized in the water solvent. The results of the analysis of students' answers showed that only 3 learners were able to achieve the "applying (C3)" indicator.

Learners with codes A14, A22, and A27 are able to connect between the phenomena that occur in salt solutions with the degree of ionization. Meanwhile, students who do not reach the indicators are caused by incomplete answers and have not connected the phenomenon with the degree of ionization, namely A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A15, A16, A17, A18, A19, A20, A21, A23, A24, A25, A26, A28, A29, A30, A31, A32, A33, A34, A35, and A36. The low achievement of learners on applying indicators can be influenced by the learning model applied. Learning models that do not involve students make students' ability to understand and apply weak. This is supported by research conducted by Boakye (2014), who found that the use of appropriate learning models (involving learners) could improve students' critical thinking, analysis, and application skills.

Item number 4 interprets the learning outcome indicator, namely "analyzing (C4)". This indicator expects learners to be able to provide explanations or descriptions of things that have been learned using their own language. Item number 4 asks learners to understand the intention of electrode immersion treatment with aqueous in the lamp flame test experiment. In the electrical conductivity test, each solution is carried out by dipping the two copper electrodes into the solution alternately, then washing them with aqueous until clean. This is done so that the solution test can obtain accurate results (the experimental data are valid), if before washing it is used for testing the results will be different from expected because it has mixed with other substances (impurities) (Suyanta, 2013).

Based on the results of the analysis of students' answers, it was found that as many as 8 students still did not reach the indicators because the answers were still incorrect or did not match the questions. The learners have codes A1, A2, A3, A4, A7, A10, A13, and A29. In addition, as many as 28 learners were able to achieve the "analyze (C4)" indicator. The learners have codes A5, A6, A8, A9, A11, A12, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A6, A27, A8, A30, A31, A32, A33, A34, A35, and A36. According to Setiawaty *et al.* (2019), low ability to analyze because students are not trained to solve problems that are analytical.

In question point number 5, one indicator of learning outcomes is described, namely "analyzing (C4)". Students are expected to be able to show the relationship between the observed

phenomenon and what is studied by comparing the two things (Hamdani, 2010:151). Item 5 asks students to analyze the relationship of the vinegar acid solution lamp flame test phenomenon (CH_3COOH) with the electrolyte properties of the vinegar acid solution (CH_3COOH). Vinegar acid solution (CH_3COOH) is a polar covalent compound that is classified as a weak electrolyte solution, because when the vinegar acid solution (CH_3COOH) is dissolved into water it is not fully ionized so that in solution there are only a few ions that can conduct electric current. This can be proved from the small number of gas bubbles and unlit lamps (Petrucci, 1985). Based on the results of the analysis of the answers of the participants, as many as 15 students were able to achieve the learning outcome indicator "analyzing (C4)". The learners have codes A2, A3, A7, A8, A10, A12, A15, A19, A22, A26, A27, A28, A30, A31, and A32. In question number 5, 21 students also obtained answers that were not appropriate or did not match the questions given. This is in line with question point number 4 where students have a relatively low ability to analyze. Low ability to analyze students because students have never been trained and given questions or problems that are analytical (Setiawaty *et al.*, 2019).

Suharwati (2014) has proven that learning using audio-visual media such as Edpuzzle videos can help provide real and clear concepts, so as to increase interest and learning outcomes from learners. Other research conducted by Silverajah & Govindaraj (2018) found that Edpuzzle activities have good potential to develop students' self-study skills and support chemistry learning outcomes especially in low-skilled learners.

Student Activities In Terms of Psychomotor and Affective Aspects during Learning using Edpuzzle-Based Videos

Student activity is seen based on observations during the learning process from several indicators including affective, cognitive, and psychomotor (Fauhah & Brillian, 2021). The learning process is carried out as many as 2 meetings with a duration of 90 minutes in each meeting. The results of the observation analysis at meetings 1 and 2 can be seen in Figure 1 and Figure 2.

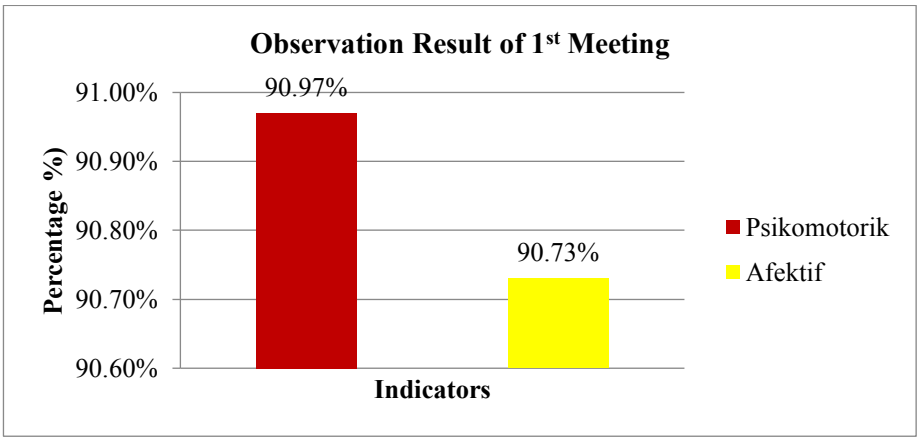

Figure 1. Results of Observations at The First Meeting

Based on Figure 1, a percentage of psychomotor indicators of 90.97% was obtained which is classified as an excellent criterion (Arikunto, 2013:89). The psychomotor indicators on the observation sheet are interpreted through statement items number 3, 4, and 5. Based on the results of observations that have been made, 17 students were obtained (A3, A4, A6, A7, A8, A13, A17, A18, A21, A23, A25, A26, A27, A32, A33, A34, and A35) did not reach psychomotor indicators and as many as 19 students (A1, A2, A5, A9, A10, A11, A12, A14,

A15, A16, A19, A20, A22, A24, A28, A30, A31, A32, and A36) is able to achieve psychomotor indicators. Psychomotor indicators are said to be achieved when there is physical activity and work skills shown by students while using Edpuzzle video.

On the affective indicator, a percentage of 90.97 is obtained, so it is classified as an excellent criterion (Arikunto, 2013:89). The items of the statement interpreting affective indicators are numbers 1, 2, 6, 7, and 8. In statement items 1 and 2, there were 10 learners (A3, A4, A6, A8, A18, A19, A23, A25, A30, and A33) who did not reach the affective indicators and 26 learners (A1, A2, A5, A7, A9, A10, A11, A12, A13, A14, A15, A16, A17, A20, A21, A22, A23, A24, A26, A27, A28, A29, A31, A32, A34, A35, and A36) which achieves affective indicators. Furthermore, in statement items number 6, 7, and 8, 13 students (A3, A7, A9, A10, A11, A13, A17, A18, A19, A20, A27, A29, and A33) have not been able to achieve affective indicators. In addition, 23 learners (A1, A2, A4, A5, A6, A8, A12, A14, A15, A16, A21, A22, A23, A24, A25, A26, A28, A30, A31, A32, A34, A35, and A36) were able to achieve affective indicators. Based on the average percentage of each indicator obtained, the average percentage for all indicators of 90.85% is obtained which is classified as an excellent criterion (Arikunto, 2013:89).

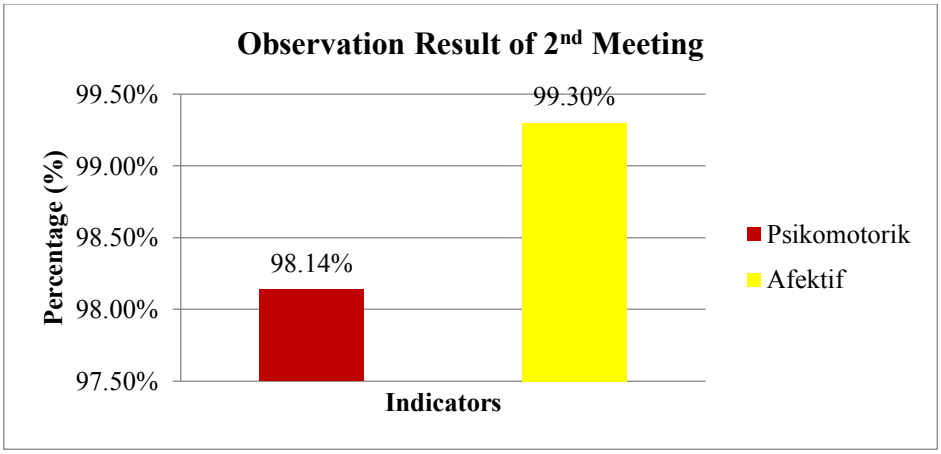

Figure 2. Results of Observations at The Second Meeting

Based on Figure 2, a percentage of psychomotor indicators of 98.14% was obtained, which is classified as an excellent criterion (Arikunto, 2013:89). The psychomotor indicators on the observation sheet are interpreted through statement items number 3, 4, and 5. Based on the results of observations that have been made, 4 students (A6, A19, A25 and A30) did not reach psychomotor indicators and as many as 32 students (A1, A2, A3, A4, A5, A8, A9, A10, A11, A12, A14, A14, A15, A16, A17, A18, A20, A21, A22, A23, A24, A26, A27, A28, A29, A31, A32, A33, A34, A35 and A36) were able to achieve psychomotor indicators. This shows that the use of Edpuzzle videos helps to improve the achievement of psychomotor aspects of students.

On the affective indicator, a percentage of 99.30% is obtained, so it is classified as an excellent criterion (Arikunto, 2013:89). The items of the statement interpreting affective indicators are numbers 1, 2, 6, 7, and 8. In statement items 1 and 2 obtained, as many as all students (A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A27, A28, 29, A30, A31, A32, A33, A34, A35, and A36) were able to achieve affective indicators during the learning process. Furthermore, in the item of statement number 6, 7, and 8. The observation results showed that as many as 3 students (A3, A4, and A14) had not been able to achieve affective indicators. In addition, 33 students (A1, A2, A5, A6, A7, A8, A9, A10, A11, A12, A13, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A27, A28, A29, A30, A31, A32, A33, A34, A35, and A36) have

achieved affective indicators. This is influenced by the use of Edpuzzle videos in the second meeting which requires learners to be more active in responding during the learning process. In addition, through the results of the analysis of the results of observations at the first and second meetings, it can be concluded that all students have an increasing involvement. This is evidenced by the average percentage of observation results which increased from 90.85% to 98.72% which was included in the excellent criteria (Arikunto, 2013:89).

The Effect of Using Edpuzzle-Based Videos on Learning Outcomes

A total of 36 students took part in pretest and posttest activities. The total number of questions is 10 multiple-choice questions. There is no difference in the question items used during the pretest and posttest. The overall pretest and posttest results can be seen in Table 6.

Table 6. Student Pretest and Posttest Score

Students Code	Pretest Score	Posttest Score	Students Code	Pretest Score	Posttest Score
A1	100	100	A19	90	100
A2	80	100	A20	100	100
A3	90	100	A21	80	100
A4	90	100	A22	90	90
A5	90	100	A23	80	90
A6	90	100	A24	90	100
A7	100	100	A25	90	100
A8	90	100	A26	90	100
A9	80	80	A27	100	100
A10	100	100	A28	100	100
A11	80	90	A29	80	90
A12	70	90	A30	100	100
A13	100	90	A31	80	100
A14	100	90	A32	90	100
A15	80	90	A33	70	100
A16	100	90	A34	100	100
A17	100	90	A35	90	100
A18	90	100	A36	90	100
Average		Pretest: 90		Postest: 96.7	

Based on Table 6, it was obtained that there was an increase in student learning outcomes referring to the average score when doing pretests and posttests. The average learning outcomes of students before using Edpuzzle videos are 90 with a minimum score of 70 and a maximum of 100. As for after using Edpuzzle video, it changes to 96.7 on average with a minimum value of 80 and a maximum value of 100. Giyanto *et al*. (2020) states that using of Edpuzzle during the chemistry learning process is effective in improving students' problem-solving abilities characterized by an increase in scores from pretest to posttest.

Furthermore, an N-Gain test was carried out to prove an improvement in cognitive learning outcomes of students (Siswadi, 2019). N-Gain test results can be seen in Table 7.

Table 7. N-Gain Test Result

Students Code	N-Gain	Criteria	Students Code	N-Gain	Criteria
A1	0	Poor	A19	0	Poor
A2	1	High	A20	1	High
A3	1	High	A21	0	Poor
A4	1	High	A22	0,50	Moderate
A5	1	High	A23	1	High

Students Code	N-Gain	Criteria	Students Code	N-Gain	Criteria
A6	1	High	A24	1	High
A7	0	Poor	A25	1	High
A8	1	High	A26	0	Poor
A9	0	Poor	A27	0	Rendah
A10	0	Poor	A28	0,50	Moderate
A11	0,50	Moderate	A29	0	Poor
A12	0,67	Moderate	A30	1	High
A13	0	Poor	A31	1	High
A14	0	Poor	A32	1	High
A15	0,50	Moderate	A33	0	Poor
A16	0	Poor	A34	1	High
A17	0	Poor	A35	1	High
A18	1	High	A36	0,8	High
Average		0.8			High

Based on Table 7, it is obtained that the analysis of N-Gain values through pretest and posttest value data is between 0-1. If the N-Gain value < 0.30 then it is included in the low criteria, the N-Gain value is between 0.30 – 0.70 then it is included in the medium criterion, and if the N-Gain value is > 0.70 then it falls into the high criterion (Hake, 1999). Through the results of the N-Gain value analysis carried out, 17 students were obtained (A2, A3, A4, A5, A6, A8, A18, A19, A21, A24, A25, A26, A31, A32, A33, A35, and A36) having an N-Gain value of 1 which is included in the high criteria. Warda (2018) states that N-Gain scores on high criteria indicate a significant improvement in learners' pretest and posttest scores.

A total of 5 students (A11, A12, A15, A23, and 25) have moderate N-Gain criteria, which indicates that the student's posttest value is quite an increase from the pretest score (Nurrohma & Adistana, 2021). In addition, as many as 13 students had an N-Gain scoree of 0 which was included in the low criteria which indicates no increase in the posttest value and pretest score (Dwiantara & Masi, 2016). Based on the N-Gain value of all students, an overall average N-Gain score of 0.80 was obtained which was included in the high criteria (Hake, 1999). This suggests that the use of Edpuzzle-based videos can improve students' cognitive learning outcomes.

In investigating the influence of Edpuzzle-based videos on students' cognitive learning outcomes, a paired sample t test hypothesis test was carried out. The paired sample t test carried out is useful to see the effectiveness of the treatment given, marked by differences in the average pretest and the average posttest (Agus, 2013:35).

Table 8. Paired Sample t Test Result

Statistics	*Sig.(2-tailed)*
Pretest-Posttest	0,000

Based on Table 8, a Sig. (2-tailed) value of 0.000 is obtained, which means less than 0.05. As the basis for decision making if Sig. (2-tailed) < 0.05, then H_1 is accepted and H_0 is rejected (Sujarweni, 2014). Based on the results of the paired sample t test conducted, it can be seen that the use of Edpuzzle-based video affects students learning outcomes on electrolyte and nonelectrolyte solution materials.

Students' Response through Questionnaire

Analysis of the results of student responses through questionnaireswas carried out to determine the response of students to the using of Edpuzzle-based learning videos on electrolyte and nonelectrolyte solution materials. Indicators of student response questionnaires include

responding, knowledge, and applying (Fauhah & Brillian, 2021). The results of the analysis of student response questionnaires can be seen in Figure 3.

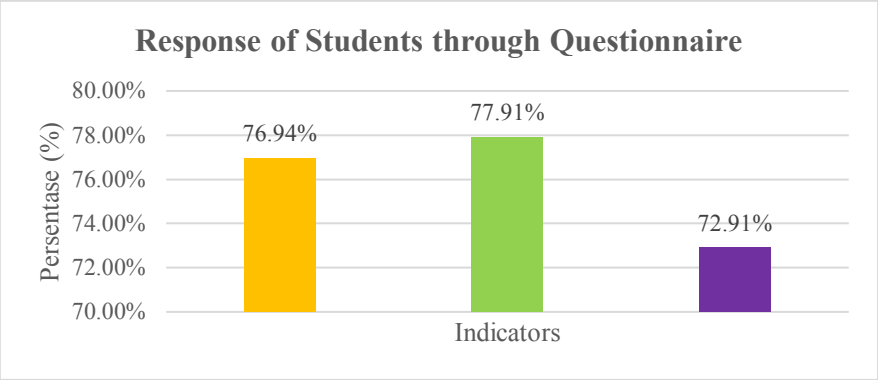

Figure 3. Results of student response analysis through questionnaires

Based on Figure 3, a percentage score on the responding indicator of 76.94% was obtained according to the good criteria (Widoyoko, 2012). This shows that students respond well to learning using Edpuzzle videos. In the second indicator, knowledge obtained a percentage score of 77.91% is included in the good criteria (Widoyoko, 2012). This shows that the use of Edpuzzle videos is able to increase the knowledge of students. In the applying indicator, a percentage score of 72.91% was obtained in the good criteria (Widoyoko, 2012). This shows that students have a desire to use Edpuzzle videos as a supporting medium during the learning process.

The questionnaire response through the three indicators used obtained an average overall percentage of 75.92% which is included in the good criteria (Widoyoko, 2012). This percentage is a benchmark that the use of Edpuzzle-based learning video on electrolyte and nonelectrolyte materials has received a good response from students. This is in line with the research conducted by Sirri & Lestari (2020), which states that learners enjoy using Edpuzzle in learning. Therefore, Edpuzzle videos can be used as one of the alternative learning media to improve student learning outcomes, especially in electrolyte and nonelectrolyte solutions materials.

CONCLUSION

Based on the results of the research and data analysis carried out, it can be concluded that the use of Edpuzzle-based video has an influence on student learning outcomes on electrolyte and nonelectrolyte solution materials. This is proven through hypothesis tests that show a Sig. (2-tailed) value of 0.000, which means a Sig. (2-tailed) value < 0.05, meaning that H_1 is accepted and H_0 is rejected. In addition, the use of Edpuzzle-based videos is able to increase student learning outcomes as seen from the average N-Gain score of 0.8 (high).

During the learning of electrolyte and nonelectrolyte solutions using Edpuzzle-based videos, the achievement of cognitive domain learning outcome indicators at level C2 in question point 1 as many as 36 people (100%), C2 level learning outcome indicators in question number 2 as many as 36 people (100%), C3 level learning outcome indicators in question number 3 as many as 33 people (91.66%), C4 level learning outcome indicators in question number 4 as many as 8 people (22.22%), and indicators of C4 level learning outcomes in question number 5 as many as 15 people (41.66%). The achievement of learning outcomes indicators is also supported by observations in terms of the psychomotor and affective realms with successive average percentages of 94.55% and 95.01% respectively.

RECOMMENDATIONS

This research has investigated the effect of the use of Edpuzzle-based learning video on learning outcomes and the achievement of student learning outcomes through using of Edpuzzle-based videos on electrolyte and nonelectrolyte solution materials. The advice that researchers can give for future research to other researchers and teachers, it is hoped that they will be able to master and understand very well in the operation of Edpuzzle-based video media that will be used so that media use can be maximized. For students, it is expected to be able to improve learning outcomes and activity through the use of Edpuzzle-based video in the learning process. Schools are expected to be able to facilitate and provide training to teachers to be able to create and utilize media in the form of Edpuzzle-based learning videos to provide a new nuance during the learning process.

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