Development of Animation Video Learning Media Loaded Contextual on Reaction Material Redox using Web Apps Animaker

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Abstract. Redox materials contain many abstract concepts. Therefore, an animated video is needed to illustrate abstract material to make it more concrete and easier to understand. This study aims to develop animated videos with contextual content on redox reaction materials using Web Apps Animaker and know the product’s quality. The data collection procedure was carried out based on the 4 steps of 4D development model (define, design, develop, and disseminate). Data collection techniques used are interview, questionnaires, and product assessment. Product assessment is carried out by material experts, media experts, reviewers, and student responses. The data obtained were analyzed using qualitative and quantitative approaches. The results of product quality assessment by material experts got 92% in the very good category, media experts got 90% in the very good category, and reviewers got 95% in the very good category. Class X high school students responded positively to the product developed with a percentage of 94.5%. Based on the results of the assessment, the videos developed can be used as alternative media for student learning independently or in groups. The developed media can also help teachers to create more innovative learning.

Keywords: animation video, contextual, redox, Animaker

Introduction

Technological developments in the era of the industrial revolution 4.0 influenced the education paradigm in Indonesia. Technology is an essential tool needed in the educational process to achieve learning goals (Firmadani, 2020). The use of technology can maximize the learning process to be more effective and efficient (Apriansyah, 2020). Using technology in the learning process can position the teacher as a facilitator and focus learning activities on students (Myori et al., 2019). Technology can also create a more effective learning process for information cycles (Daulay et al., 2020). In addition, the learning atmosphere can become more conducive and systematic with the use of technology (Salsabilla et al., 2021). But behind the myriad of benefits, the fact is that the use of technology by teachers in the learning process is still in the low category and has not been used optimally (Setiawan et al., 2019).

The lack of teacher skills and knowledge about technology causes minimal application of digitalization in the learning process (Wen & Tan, 2020). Technology-based learning media development training can be a solution for improving teacher skills in technology (Kis et al., 2021). These training activities can provide new insights for teachers...
regarding the development of technology-based learning media and their benefits in the learning process (Sari et al., 2020). Learning media is a supporting tool that can make delivering and receiving material in class more interactive (Nurrita, 2018). Accurately determining learning media can strengthen material delivery to be more concrete and increase student learning motivation (Rasagama, 2020). However, when observing phenomena in schools, teachers are generally still dominant in using instructional media in the form of textbooks and modules (Effendi et al., 2020). Print media, such as textbooks, and modules tend to be informative, reducing students’ interest in participating in learning. Based on the survey results, information was obtained that 93.8% of students wanted a renewal of learning media following the times (Muhammad et al., 2020).

Interactive multimedia technology, such as animation videos, can be one of the innovations for teachers in updating learning media. Animated videos are a medium that is composed of audio and visual aspects to convey material (Apriansyah, 2020), providing a comfortable learning atmosphere, increase student learning motivation, and increase student understanding (Bulkani et al., 2022). Visual projections in animation videos are composed of various images that start still and move to resemble a character according to the creator’s design. The development of animated videos can be done quickly with the help of web apps Animaker. Web apps Animaker provides a variety of animated characters and features that can combine all characters with sound accompanied by transition effects to create artistic learning videos (Munawar et al., 2020). Animaker has several advantages, such as products that can be downloaded easily, are free of charge, user-friendly, and there are various choices of quality and sizes of the videos provided. The animation features available in Animaker are arranged simply so beginners can learn them quickly. However, most school teachers still have difficulties making animated video-based appropriate learning media to students’ characteristics and ways of learning (Sunami & Peace, 2021).

Making learning media appropriate to the type and way of student learning can be realized using a learning approach. The learning approach is a combination of methods and strategies used by the teacher during the learning process (Toraman et al., 2020). Using a learning approach can involve students actively in building their understanding (Dewi & Dwikoranto, 2021). One learning approach suitable for student development is contextual (Angjelina & Asrizal, 2019). Contextual learning can be realized by associating the material studied with its application in everyday life. A contextual approach can make it easier for students to find, understand, and apply the concepts taught by the teacher (Anggraeni et al., 2020). In addition, students can also study material concepts independently so that the learning activities carried out become more optimal. Research by Parhusip & Hardini (2020) states that a contextual approach can increase activity, collaboration, and a comfortable learning atmosphere for students. Contextual approach in video animation can shape abstract material concepts into more concrete ones.

Abstract material concepts can be found in chemistry subjects, especially redox material. Redox material’s characteristics are symbolic, macroscopic, and microscopic aspects (Sukmawati, 2019). Macroscopic and symbolic aspects of redox reaction material tend to be easily understood by students, but microscopic aspects often raise students’ doubts (Hatimah & Khery, 2021). The release and capture of electrons, oxygen, and oxidation numbers are microscopic aspects that often make it difficult for students to learn redox material (Apriadi & Redhana, 2018). Research by Rizki et al. (2020) stated that 50.71% of students experienced misconceptions about redox reaction material. This fact is supported by research by Purwanto et al. (2022), who revealed that redox reactions are one of the most challenging chemical materials to understand during online learning. Therefore, learning media is needed in the form of videos easily accessible to students at school and home.

In line with research conducted by Nabila et al. (2023), Animaker can produce learning media that is useful for students and teachers. The animated videos developed...
can make it easier for students to understand the subject matter presented. In addition, chemistry teachers feel that there is an increase in the quality of learning by students when using exciting media. The research results of Mukasheva et al. (2023) also state that using a contextual approach can provide more excellent opportunities for designing effective technology-based learning media. Based on the description above, this study aims to develop animated videos with contextual content on redox reaction materials using web apps Animaker and know the products' quality.

**Methods**

The research is a type of research and development. This research aims to produce a valuable product and test the product’s quality. The development model in this study is the 4D model developed by Thiagarajan et al. (1974), which includes define, design, develop, and disseminate stages. The 4D development model can be seen in Figure 1.

![Figure 1. 4D development models](image)

4D development model selection was because the research steps in this model were arranged in a complex and systematic manner so that it could meet the needs of the researchers in this study. The define stage consists of several stages of analysis, the first of which is needs analysis. Needs analysis was conducted through interviews and observations at MAN 1 Yogyakarta, MAN 2 Yogyakarta, SMA N 1 Gamping, and SMA N 8 Yogyakarta. Interviews were conducted to determine the use of learning media, characteristics of the material, student learning type, and constraints experienced by the teacher during the class. Next is learner analysis, which is composed of student analysis related to students' difficulties and attitudes during learning at school and at home. Based on the results of the two processes, the concept process is carried out as an analysis to analyze the material that will be included in the learning media. The define stage ends with tasks analysis which provides an analysis of indicators, material components, and learning objectives that will be explained.

The design stage includes the media selection process to identify appropriate learning media according to the needs analysis from the define stage and the selection of supporting web apps. Then, it is continued with the selection format process to design the flow of presentation of the material and content of the learning media being developed. The following design stage is the reference collection, namely the collections of redox material from various sources, including printed books, online literature reviews, to consultations with an expert. The design phase ends with the initial process design, namely the product design process, such as preparing a video narrative, making animated videos, synchronizing audio videos, final media completion process, qualifying questions, and designing assessment instruments.

The development stage consists of several processes, such as expert appraisals and testing. The expert appraisal process is carried out by evaluating the product with material and media experts to obtain product quality assessment results. Product quality assessment is carried out using a Likert scale instrument with a column of criticism and suggestions for improving the product being developed. Furthermore, in the development testing process, an assessment was carried out by a reviewer (high school chemistry teacher) using the Likert scale instruments and limited trials is carried out to class X high
school students using the Gutman scale instruments. The Gutman scale instrument in the student response test consists of positive and negative statements in each aspect. The average scores from the results of the assessment and student response tests are calculated using the following equation:

$$ \bar{X} = \frac{\sum x}{n} \quad (1) $$

Remarks:
- $\bar{X}$: average scores
- $\sum x$: total score
- $n$: number of appraisers

The score obtained will be converted into a qualitative score with a total assessment classification, as seen in Table 1.

**Table 1.** Criteria category total assessment

<table>
<thead>
<tr>
<th>No</th>
<th>Quantitative Score Range (i)</th>
<th>Category Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$X &gt; Xi + 1.80 \text{ SBI}$</td>
<td>Very good</td>
</tr>
<tr>
<td>2.</td>
<td>$Xi + 0.60 \text{ SBI} &lt; X \leq Xi + 1.80 \text{ SBI}$</td>
<td>Well</td>
</tr>
<tr>
<td>3.</td>
<td>$Xi - 0.60 \text{ SBI} &lt; X \leq Xi + 0.60 \text{ SBI}$</td>
<td>Enough</td>
</tr>
<tr>
<td>4.</td>
<td>$Xi - 1.80 \text{ SBI} &lt; X \leq Xi - 0.60 \text{ SBI}$</td>
<td>Not enough</td>
</tr>
<tr>
<td>5.</td>
<td>$X \leq Xi - 1.80 \text{ SBI}$</td>
<td>Very less</td>
</tr>
</tbody>
</table>

The data will then be processed in the form of a score, and the percentages of product ideality will be calculated by dividing the score obtained with the ideal maximum score. Then the data obtained is processed into qualitative with the criteria in Table 2.

**Table 2.** Data interpretation

<table>
<thead>
<tr>
<th>No</th>
<th>Information (%)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 – 20</td>
<td>Very Not Good</td>
</tr>
<tr>
<td>2</td>
<td>21 – 40</td>
<td>Not good</td>
</tr>
<tr>
<td>3</td>
<td>41 – 60</td>
<td>Pretty good</td>
</tr>
<tr>
<td>4</td>
<td>61 – 80</td>
<td>Well</td>
</tr>
<tr>
<td>5</td>
<td>81 – 100</td>
<td>Very good</td>
</tr>
</tbody>
</table>
The dissemination stage consists of packaging, diffusion, and adoption. The packaging process comprises product packaging processes to make them more effective and user-friendly. Product packaging is carried out by uploading the product on the youtube and google drive platforms. With the proper packaging process, more parties can utilize research products. While the diffusion and adoption processes consist of product dissemination to chemistry teachers and students at MAN 1 Yogyakarta, MAN 2 Yogyakarta, SMA N 1 Gamping, and SMA N 8 Yogyakarta so that they can be adopted, studied, and used during learning.

**Results and Discussion**

The research was conducted using the 4-D development model developed by Thiagarajan (1974). The research process carried out is as follows:

**Define**

The define stage includes an analysis of the needs of the product to be developed. Needs analysis relates to the learning process, learning media, and the chemistry material taught. Needs analysis was carried out at MAN 1 Yogyakarta, MAN 2 Yogyakarta, SMA N 1 Gamping, and SMA N 8 Yogyakarta. Based on the results of observations and interviews, information was obtained that the learning media used by the teacher generally in the form of textbooks, powerpoints, and material summaries. The selection of learning media is based on the ease of access to teaching in class. The teacher has used learning media in videos originating from youtube. However, the video used differs from the material teachers want to convey in class, so learning using video is no longer carried out. Teachers also still find it challenging to make learning videos independently (Bruggeman et al., 2022). The teacher explains that they have yet to learn the method of exciting video creation. In addition, the use of textbooks can cause misconceptions if students learn independently. Misconceptions can be caused because the discussion contained in textbooks is still too complex (Afifah et al., 2023). PowerPoint media is also still not optimal for presenting abstract redox material. Media PowerPoint cannot explain the microscopic aspects of redox reaction materials. Based on a literature review, data was obtained that 50.71% of students had misconceptions about redox reaction material (Rizki et al. al, 2020). The interview results also stated that the use of learning media above resulted in learning centralized only to the teacher. Interesting learning could be pushed with the use of interactive learning media. One of the interactive learning media could be embodied with arranged media on audio, video, text, images, and animation to help deliver theory (Nurlatifah & Suprhatiningrum, 2023).

When viewed from the perspective of high school students, using learning media such as textbooks does not inspire students enough because the material is still quite complex. Students need learning media that is simpler and easier to understand (Ikhsannudin, 2022). According to the results of student interviews, the most challenging redox reaction material can be found in the sub-chapter of rules and determination of oxidation numbers. For example, students are often confused when determining the oxidation number of hydrogen is +1 and -1. Therefore, students will look for alternative learning materials and media for independent learning. In addition to learning media, a possible approach is needed to make it easy for students to understand the redox theory, which is the contextual approach. Approach contextual own role urgent in development education. Subject matter with payload contextual could give knowledge to students related to its application in daily life. Knowledge in a contextual manner could prove that knowledge chemistry is very sticky with human life (Nurhana et al., 2022). The chemistry teacher explained that a contextual approach is essential for used moment learning so that...
theory feels more effective and valuable. Based on the needs of students and teachers in learning, an animated video learning media was developed with a payload contextual to the material reaction redox.

**Design**

The design stage comprises the product design process based on the needs analysis results at the define stage. The product design includes determining the type of learning media, content, and assessment instruments. Based on the results of the define stage, the instructional media developed is an animated video containing a contextual approach to redox reaction material. Animated video learning media has many advantages, such as being easy to access, increasing student interest in learning, and can be designed according to the desired explanation of the material (Hanif, 2020). Planning activities are completed by compiling a material framework, content, delivery flow, supporting animations, practice questions, selecting devices to be used, and assessment instruments. The material's content is adjusted to the revised 2017 edition of the 2013 chemistry curriculum on Basic competency 3.9, which focuses on redox reaction material in high school class X. Material preparation was carried out by reviewing several chemistry subject books and relevant digital literature. The preparation of the material was also consulted by experts to avoid misconceptions.

The hardware used in the design stage is laptops and smartphones. Laptops are used for editing and creating animated videos. Smartphones are used for data transfer and audio recording. Software used in this study includes web apps Animaker, Wondershare Filmora, Adobe Illustrator 2020, Canva, and google drive. Web apps Animaker is used for preparing animated videos because it has many supporting animations that can be utilized (Paino & Huta, 2022). Wondershare Filmora is used to combine audio and visuals from animated videos that have been compiled. Adobe Illustrator 2020 and Canva are used for compiling graphic designs and selecting animation support materials like gifs. Meanwhile, google drive stores important files from developed learning media and a container for storing animated videos. The supporting websites used are www.remove.bg to remove the background from images, www.unscreen.com to remove the background from videos or gifs, and www.bit.ly.com to shorten links and convert links to be quick response code that will be used.

Designing animated videos is carried out by accumulating material, designing video components, writing video narrator scripts, compiling animated videos through web apps Animaker, audio-video synchronization, and finishing process. Designing an animated video starts with preparing and analyzing redox reaction material. The material analysis aims to determine the material's characteristics and the depth of the material to be presented. Redox reaction material that will be presented includes 1) a Definition of redox reactions, 2) a Classification of redox reactions, 3) a Definition of oxidation numbers, 4) a Determination of oxidation numbers, 5) a Determination of changes in oxidation numbers, 6) Determination of oxidizing agents, reducing agents, oxidation products, and reduction products, and 7) Application of redox reactions in everyday life. After the material is prepared, determine the animated video's components. Animated video components consist of opening, content, and closing. The process continues with writing video scripts based on predetermined materials and components. Narrative scripts are tailored to the needs of researchers in making animated videos. The narrative script is then recorded using a smartphone, and the data is transferred to a laptop for synchronization.

The following process is in the form of preparing animated videos using web apps Animaker. Compiling the video begins with creating an animated visualization following the script design and predetermined components. The process of making an animated video can be seen in Figure 2.
Figure 2. The process of making animated videos through web apps Animaker Animation customized with discussion medium material delivered. Making an animated video is continued by designing fragments on the opening, content, and closing components. The opening component of the animated video is the initial part composed of the title, learning objectives, apperception, and stimulus. The form of the initial display can be seen in Figure 3.

Figure 3. Video opening section

The next component is content. The content section comprises the textual and contextual presentation of material, examples of questions and solutions, and practice questions that students can access. The display of the contents section can be seen in Figure 4.

Figure 4. Content section

The last video component is the closing. The closing section consists of concluding material, information related to the following video, and acknowledgments. The cover display can be seen in Figure 5.
The animated video comprises six videos discussing each redox reaction sub-material. Each video is animated consisting of audio material and character explanations working animation to clarify the delivery of redox reaction material. Redox reaction material is presented in detail, depth, and combined with a contextual approach. The process of delivering the material is done by presenting supporting characters and animation. The animated characters are like the teacher’s character, with body movements explaining the material. Inserted pictures and animated characters aim to illustrate the material. For example, as in the explanation of rusty iron, an animation describes the iron's color change from silvery gray to yellow-brown. In addition to animation, this learning media is also equipped with contextual content. Contextual content can help students to find out the benefits of the material being taught by applying it to everyday life (Mubarok et al., 2022). Based on a literature review, there have been several studies on developing animated video learning media, such as those conducted by Asrori et al. (2021) and Dewi & Kamaludin (2022). Based on similar research that has been done, it is still rare to find the preparation of animated video learning media using web apps Animaker and contextual loading on redox reaction material. Therefore, the development of this product is given contextual content as an update from similar research.

Contextual content consists of 7 components: asking, finding, constructivism, modeling, learning communities, reflection, and actual assessment (Sujiono et al., 2023). However, in this research product, only five contextual components are presented. The material in this animated video is presented without actual assessment and constructivism components, so it is limited to reflection.

The assessment component actually and constructivism will be more effective if directly applied to the learning process in the classroom. This is because the actual assessment requires information related to student development from the beginning to the end of learning (Kosimov, 2022). It is quite difficult to observe if it is only in the form of media development (Khairunnisa et al., 2020). The asking component in the animated video is presented in the form of an opening question as a stimulus for students. The purpose of giving questions at the beginning of the video is so that students can connect events that have been experienced in everyday life with the material to be studied. The appearance of the asking component can be seen in Figure 6.
The find component relates to the ask component. From the asking component, students are encouraged to find answers so that the finding component is indirectly adapted to the media. Activity finds accompanied by exposure theory reaction possible redox found daily in life. Several example theories loaded context that is rooting iron, decay apples, burning process, and utilization of compound redox in life every day. The display of the find component can be seen in Figure 7.

![Figure 7. Find component](image)

The modeling component is adapted as an example of applying the material in practice textual and discussion of questions (Rachmawati et al., 2020). Example application theory in a textual manner could be designed with a gift example question. Then next, with discussion and methods fast for complete question given. The appearance of the modeling components in this product can be seen in Figure 8.

![Figure 8. Modeling component](image)

The components of the learning community are adapted in the form of assignments or materials that can be discussed with peers (Ismayani et al., 2019). The discussion material in this animated video is application material in daily life and gift questions. Ten questions related to the whole redox reaction material are presented to be able to discuss becomes ingredients for the student. The question given consists of knowledge textual and contextual. Presentation practice about done via Google Forms and can be accessed via the link as well as quick response (QR) code which can be seen in Figure 9.

![Figure 9. Learning community component](image)

The reflection component is adapted into an animated video in the form of material reinforcement and conclusions from what has been learned (Aulia, 2019). The conclusion of each discussion is inserted at the end of the video as part of the closing, which can be seen in Figure 10.
After the animation preparation is complete, the audio synchronization with the animated video is carried out. The synchronization process uses the Wondershare Application Filmora to facilitate the editing process. Apart from inserting audio narration, during the synchronization process, it is also accompanied by providing a background. Giving background aims to create a cheerful atmosphere in the developed animated video (Hapsari et al., 2019). The audio-video synchronization process can be seen in Figure 11.

The process of preparing the animated video ends with the video publication stage. The format used in this animated video is .mp4, with a screen resolution of 1334 x 750. The resulting screen resolution is already at a high standard definition (HD), so the resulting video will be clear when watched. For easy access, videos are uploaded via google drive and youtube. Animated videos were submitted to the lecturer mentor for correction and then could be repaired based on the correction of the results.

After the video is finished, the following process is making research instruments. The research instruments developed consisted of two types: product quality assessment instruments and student responses. The product quality assessment instrument was developed using the Likert scale, while the instrument for student responses used the Guttman scale. Aspects assessing product quality include materials, videos, and contextual content. At the same time, aspects for student responses consist of material aspects, presentation, animation, contextual content, and benefits. Instrument experts validate instruments that have been made.
Develop

Based on the results correct from the lecturer, conducted repair product to generate product revision. Product revision was then evaluated by three peer reviewers, validated by one material expert, one media expert, and four reviewers, and then responded to by twenty high school students in grade X. The results of the product quality assessment and student responses can be seen in Table 3.

Table 3. Data on product quality assessment results and student responses

<table>
<thead>
<tr>
<th>Assessment/Response</th>
<th>Assessment Aspect</th>
<th>Σ Scores</th>
<th>Σ Ideal Maximum Score</th>
<th>Ideal Percentages</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material experts</td>
<td>Theory</td>
<td>14</td>
<td>15</td>
<td>92</td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td>Contextual</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media expert</td>
<td>Videos</td>
<td>18</td>
<td>20</td>
<td>90</td>
<td>Very Good</td>
</tr>
<tr>
<td>Reviewer</td>
<td>Material</td>
<td>19</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contextual</td>
<td>19</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Videos</td>
<td>19.25</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>Theory</td>
<td>8.5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presentation</td>
<td>9.25</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Animation</td>
<td>10</td>
<td>10</td>
<td>94.5</td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td>Contextual</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Benefit</td>
<td>9.5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 3 it is known that the results of the assessment by material experts obtained an ideal percentage of 92% in the very good category. Those results state that the developed product has depth, sufficient material, appropriate language, and good plot delivery. Depth material and appropriate language usage could make presentation knowledge more easily accepted by students (Panjaitan et al., 2020). In addition, material experts provide suggestions by adding institutional logos and corrections related to practice questions and learning objectives. Suggestions are made in the improvement process so the developed product can load suitable content. Based on the evaluation expert material, got concluded that the material and payload of the contextual animation in the video are very appropriate and appropriate for help explanation material. The media expert’s assessment obtained a result of 90% in the very good category. Those results state that animated video covers good audio and video aspects. Media experts also provide suggestions regarding the choice of colors that must contrast between the text and the image or video background. Election contrasting colors could increase attention audience and quality exposure theory (Sugiyanto et al., 2022). Product evaluation by reviewers obtained an ideal percentage of 95% in the very good category. Reviewers also provide suggestions and input, such as the selection of animated characters that can be readjusted to the ongoing material, and the size of the text used can be enlarged so that it is more explicit. Based on the results of assessments from material experts, media experts, and reviewers, data is obtained that the animated video developed has an excellent category. So, the animated video can be used as an option and interest learning media in material redox reactions well in class or moment study independently.

Class X high school students then responded to the redox animated video material. Based on the results of student responses, the animated video learning media developed
obtained an ideal percentage of 94.5% in the very good category. Response results from students stated that theory with payload contextual gives more impression meaningful and easily understood by students. Corresponding with the research (Budiman et al., 2021), payload contextual could help deliver material about application knowledge in everyday life. In addition, it is also known that the animation used can help visualize abstract redox reaction material (Naimah, 2022). Then, students also stated that animated videos helped increase students understanding when studying individually or in groups.

**Dissemination**

The dissemination stage is carried out so many parties can feel the product’s benefits in animated videos. Product packaging is carried out by uploading an animated video to a youtube account so students can access it. Besides going through youtube, product packaging also uses google drive with the link [https://bit.ly/AnimasiReaksiRedoksX](https://bit.ly/AnimasiReaksiRedoksX). The research products were distributed to chemistry teachers and students at MAN 1 Yogyakarta, MAN 2 Yogyakarta, SMA N 1 Gamping, and SMA N 8 Yogyakarta. Product dissemination aims to enable video-animation learning media to be adopted, studied, and used during learning (Harun et al., 2023).

Based on the development, this animated video learning media benefits teachers and students. For teachers, this animated video learning media can be used as a material supplement, alternative learning media, and assignments (Fadhli, 2022). The ease of access to the animated videos developed is also an added value for teachers because they are easy to use (Pratama et al., 2022). This animated video can help students visualize the relationship between redox reaction material and phenomena in everyday life. According to the students, the developed animated video learning media contained complete and easy-to-understand explanations. Animated videos can also reduce students’ boredom while learning (Safitri et al., 2021). Packaging engaging animation could push students to focus and study deeply (vans Alten et al., 2019). Students also find it easy to use animated videos because they are available on youtube and google drive and can be accessed via the links provided at any time.

**Conclusion**

The product developed is an animated video with contextual content on redox reaction material using Web Apps Animaker. The development process is carried out with 4D stages. Developed animated video arranged on component opening, content, and closing. Reaction material redox served with payload contextual. Component contextual content loaded in the animated video is asking, finding, modeling, community study, and reflection. Animated video learning media benefits teachers and students during activity learning because it could help explain theory reaction abstract redox becomes more concrete. Based on the results of the assessment, this animated video obtained an ideal percentage of 92% from material experts in the very good category, 90% of media experts in the very good category, 95% of the reviewers in very good category, and 94.5% of the student response test with very good category. Thus, the animated video is of very good quality and feasible to be used as an alternative learning media on redox reaction material in classroom learning.
References


