# Development of cartoon art learning media (CALM) to improve children's conflict resolution skill

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**Abstract**

The aim of this study was to develop Cartoon Art Learning Media (CALM) to improve children's conflict resolution skill. The research method used was ADDIE (Analysing, Designing, Developing, Implementing and Evaluating) model. The subjects in this study were 27 (first trial) and 43 (second trial) fifth-grade students (with an average age of 11-12 years) at one of the public elementary schools in Karawang, West Java, Indonesia. The data collection instruments were in the form of a questionnaire, an assessment instrument and a conflict resolution ability test for fifth-grade elementary school students. The data analysis used is percentage and paired two-sample *t*-test for the mean to see the difference in the test results. In the evaluating stage, CALM was valid and effective to use based on experts' validation and trial results. Thus, it can be concluded that CALM can be used to improve children's conflict resolution skill.

Keywords: ADDIE, cartoon, children, conflict, media

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## 1. Introduction

Learning includes the process of teacher-student interaction and learning resources in a learning environment. Ideally, learning builds interactions that enable learning goals to be optimally achieved in the form of learning outcomes (Kadir et al., 2020; Senen et al., 2021). Current learning systems require students to act not only as recipients of materials, but also as communicators or senders of materials, resulting in two-way, multifaceted communication (Widodo & Wahyudin, 2018). Learning communication requires learning media to improve the effectiveness of learning success goals, i.e., the learning process occurs when there is communication between the recipient of the message and the source or channel message over the media (Herrmann & Kienle, 2008). When the media provides a message or information for educational purposes, or contains educational materials, it is a medium called learning media.

Learning in elementary school is carried out with integrated themes that provides a variety of activities for students to explore topics and themes. However, it turns out that there is less interest in reading in the elementary school environment (Martins et al., 2021; Skaalvik, 2004; Ulusoy, 2019). Factors that influence a child's reading include the style and medium of reading and the teacher's instructions (Behrmann & Souvignier, 2013; Strawhacker et al., 2018). Teachers are focusing on government textbooks as teaching materials because of the lack of book support for learning problems. Textbook materials are not extensive, so teachers need different sources to create topics. Students are more interested in reading picture books than textbooks. Children often remember stories and use pictures to assist in reading. Since there is no picture book containing learning materials, students cannot understand the materials and the results of cognitive learning are low (Carifio & Perla, 2009).

Today, cartoons are one of the most popular children's television shows on various television channels. Most elementary school kids love cartoon characters more than any other movie. In fact, many toy makers have successfully sold toys because they employ cartoon and animated characters. In addition to toys, there are also school supplies shaped like cartoons, such as pens, notebooks and bags. There are also many successful video games that make a kid idol because of the use of cartoon characters.

In this study, besides being developed as a learning media, cartoons also contain conflict resolution. Conflicts that occur among school students, especially elementary schools, can be an indicator that they do not have good conflict resolution skills. The ability and skills to resolve conflicts without violence should be taught to children and young people as early as possible when they enter school, so that they will have the skills to resolve conflicts constructively (Wallace & Brand, 2012). Conflicts that occur in schools are generally caused by a lack of communication, cooperation and collaboration. Resolving conflicts for elementary school children is a difficult task. In this case, it is necessary to involve teachers in teaching conflict resolution to students. The only improvement between such conditions is the teacher's ability to implement effective teaching methods and media (Broadhead, 2009).

### 1.1. Theoretical framework

Learning media are tools or devices for implementing processes that enable educators and learners to perform learning activities (Schneider et al., 2020; Widodo & Wahyudin, 2018). Apart from that, this study addresses the importance of learning media as a tool for communicating learning messages. The message is conveyed and accepted by the teacher to stimulate the student's thinking, emotions, attention or willingness to strengthen the learning process. The message or information conveyed by the learning media may be in the form of a message tailored to the student's learning needs and abilities

so that the student can actively participate in the learning process (Heyd-Metzuyanim, 2013; Slavich & Zimbardo, 2012). In addition, the learning media is connected to other components to create the expected learning situation; abstract the abstraction to reduce the occurrence of language disorders; and increase the inspiration of students in learning activities, a component that reduces learners' misunderstandings about explanations. Other than that, it enables the learner's unlimited experience, direct interaction between the learner and his environment, produces unified observations, and motivates and inspires children to learn (Widodo & Wahyudin, 2018).

According to Piaget, individuals experience stages of cognitive development from sensorimotor, preoperative, concrete, and formal operation (Widodo & Wahyudin, 2018). As they get older, the placement of nerve cells becomes more complex and the performance of nerve cells improves. As an individual progresses into adulthood, he or she will experience biological adaptations to his or her environment, as there are qualitative changes in his or her cognitive structure. To achieve the stage of cognitive development, the stage of cognitive development can be achieved at various ages; the child does not skip the stage of cognitive development, and the child does not withdraw from the stage of cognitive development (Dempster & Corkill, 1999; Papadopoulos et al., 2004; Saracho, 2021). Based on Piaget's theory, elementary school children (7-12 years old) are in a concrete operational stage. Therefore, learning media are needed that are in accordance with the cognitive development of elementary school students in order to keep up with technological development (Akyuz & Keser, 2015; Astra et al., 2015; Senen et al., 2021; Supriyatno et al., 2020), one of which is comics.

Comic is one of the picture stories that presents an easy-to-remember, consistent and ordered plot. Comics are beginning to be used by some teachers as an educational tool that can stimulate students' interest in a variety of disciplines. Comics are used as a suitable learning medium to enhance reading interest and cognitive learning outcomes (Beard & Rhodes, 2002; Chen et al., 2018; Matuk et al., 2021). Students will find it easier to understand the subject by looking directly at the subject. Students tend to prefer colour picture books that are visualised in a realistic or cartoon form.

The cartoon art developed in this study is a character taken from a student's environment, such as teachers, principals and community leaders in Karawang area, named Cartoon Art Learning Media (CALM). CALM was developed using Adobe After Effects, Adobe Photoshop and Adobe Premiere Pro software for fifth grade elementary school students, with the theme of the environment. CALM was developed based on the principle of quantum learning. The main principle of quantum learning is to bring their world (students) to our world (teachers) and our world (teachers) to them (students).

The CALM developed in this study also includes a story of conflict and resolution adapted to the characteristics of elementary school students. Conflict is defined in the research literature as an event in which one-person protests, retaliates, or resists the actions of another (Chen, 2003; Shin & Cho, 2020). Therefore, they affect multiple people. Conflicts arise from living in groups, but individuals need to reduce competition and reduce costs by developing strategies to resolve conflicts of interest (Broadhead, 2009). Conflicts occur naturally in human interactions, and if properly managed, it can be a very constructive route for necessary changes (Smith & Williams-Jones, 2009; Vestal & Jones, 2004). The ability to solve social problems gives children the proficiency needed to deal with stressful life events. In addition, problem solving and dispute resolution skills can reduce the risk of children's adaptation to difficulties, even for children in low-income and troubled families.

Young children often experience episodes of social conflict in their daily interactions with their peers (Pieng & Okamoto, 2020; Ricaud-Droisy & Zaouche-Gaudron, 2003). The dissemination of conflict experiences at an early age has important implications for the development of personal and

interpersonal relationships. Conflicts provide young children with the opportunity to recognise the existence of different perspectives, justify their position while considering the perspectives of others and compromise to reach a fair solution (Pieng & Okamoto, 2020; Roth, 2007; Zemplén, 2007). Children make peace after a conflict and this increase with age when opportunities arise in their daily lives (Walker et al., 2008). Children can resolve conflicts between peers without the direct intervention of an adult. Although constructive and friendly conflict resolution has social benefits, most children often adopt strategies that lead to unfair outcomes.

The school and classroom environment can also be stressful and conflicting (DiCarlo et al., 2020). It is not natural for children to be in large groups with few adults and sometimes cramped. Education at school requires a peaceful environment to support quality learning processes (Allodi, 2010; Crawford, 2005). The calmness of school students is not easy to achieve in reality. In fact, there are more and more recent signs that schools have no peaceful implications (Duffy, 2000; Swick, 2006). Conflicts have been fought by some students in the school, ranging from the simplest forms of verbal action to fighting, pursuit, and even serious physical violence in the form of murder. Violence at school adversely affects the physical and mental health of students.

### 1.2. Related research

Several previous studies have developed and used cartoon media in the field of education. Beard & Rhodes (2002) used comic strips as reflective tools in adult learning and Mcvicker (2018) used comic strips for reading instructions. Matuk et al. (2021) uses comics to promote engagement, equality and diversity in science classroom, whereas Chen et al. (2018) used digital comic performance-based learning to promote autonomy and ownership in studying English. In addition, Senen et al. (2021) used the media of photo comics to change reading interest and learning outcomes in elementary social studies subject.

From previous research, comics' media have been used but not specifically for cartoon art. There is also not much research conducted at the elementary school level. In addition, there is no research that uses cartoon art that is oriented towards children's conflict resolution. Therefore, the development of CALM can contribute to science and research.

### 1.3. Purpose of the study

Based on the above-mentioned issues, developing a conflict-solving learning media for elementary school students that integrates social studies learning and social studies learning not only gives students a cognitive aspect, but also has good values and attitudes. Therefore, the aim of this study was to develop a CALM to improve children's conflict resolution skills in elementary school.

## 2. Method and materials

### 2.1. Research model

The research method used in this study was used ADDIE (Analyzing, Designing, Developing, Implementing and Evaluating) model, as shown in Figure 1. This research method will be used as a guide in the Results and Discussion section.
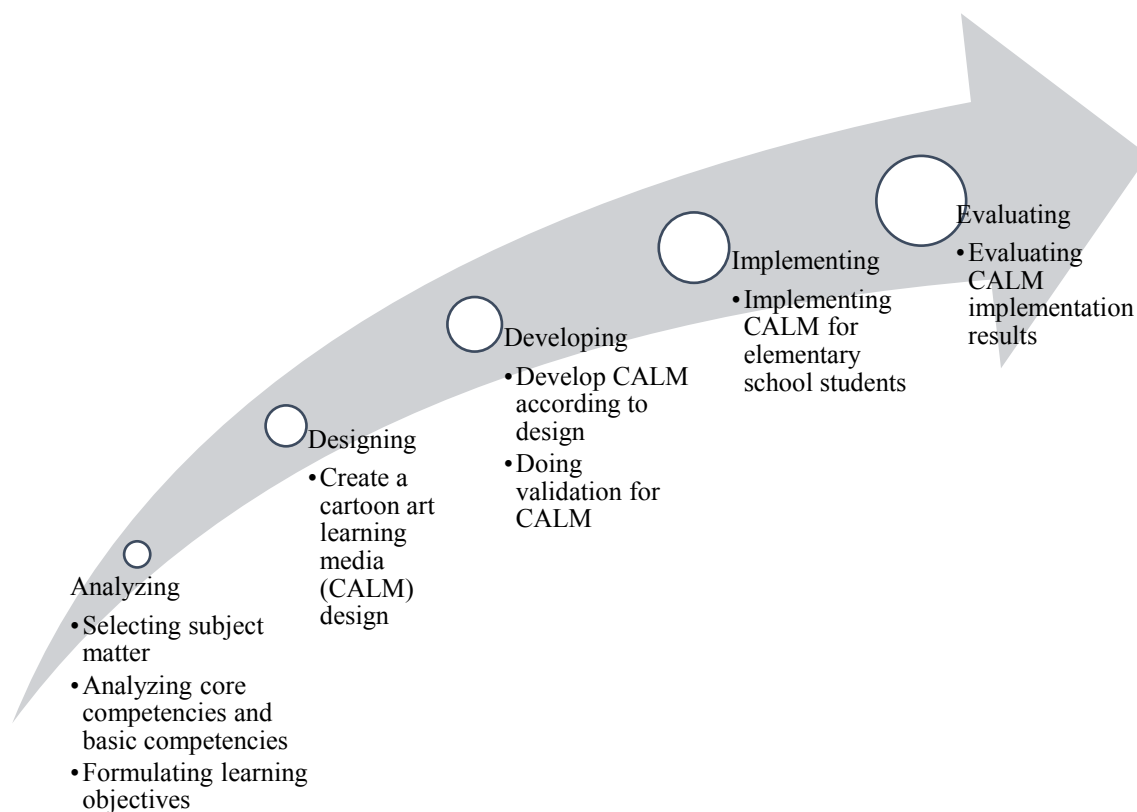
Figure 1. Research method through the ADDIE model

## 2.2. Participants

The implementation of this research was conducted in one of the public elementary schools in Karawang, West Java, Indonesia. The subjects in this study were 27 (for first trial) and 43 (for second trial) fifth grade students (with an average age of 11-12 years).

## 2.3. Data collection tools

The data collection instruments were in the form of a questionnaire, an assessment instrument and a conflict resolution ability test for fifth-grade elementary school students. Questionnaires were used to determine students' responses to the use of CALM; assessment instruments were used to carry out expert validation; and the conflict resolution ability test was used to determine students' conflict resolution skills before (pre-test) and after (post-test) using CALM.

## 2.4. Data collection process

Data were obtained from the initial development process, starting from the analysis, design and development stages. After the CALM development and validation stage, CALM was then tested on elementary school students. From the results of this implementation, data were obtained in the form of a questionnaire about student responses to CALM and the results of students' conflict resolution skills in the form of pre-test and post-test.

*2.5. Data analysis*

The data analysis used is the percentage and t-Test Paired Two Sample for Means to see the difference in the test results. The percentage obtained is then adjusted to the media eligibility criteria in Table 1 (Lafifa et al., 2022).

Table 1. Media eligibility criteria

| Percentage (%) | Criteria |
|---|---|
| 81-100 | Very valid |
| 61-80 | Valid |
| 41-60 | Less valid |
| 21-40 | Invalid |
| <20 | Very invalid |

## 3. Results

This section displays the ADDIE model below.

*3.1. Analysing*

At the analysis stage, several things are carried out, such as selecting subject matter, analysing core and basic competencies, and formulating learning objectives. The subject matter selected at this stage is the environmental theme. The core competencies consist of attitudes, knowledge and skills. The selected basic competencies include civic education lessons, Indonesian language and social sciences. The goal is that in the subject of civic education, students are expected to be able to examine the socio-cultural diversity of the community. In Indonesian subjects, students are expected to be able to sequence events or actions contained in non-fiction texts. Finally, in social science subjects, students are expected to be able to analyse the role of the economy in an effort to improve people's lives in the social and cultural fields to strengthen the unity and integrity of the Indonesian nation and its relationship with spatial characteristics.

*3.2. Designing*

At the designing stage, we made a CALM design. The CALM design is adapted to the previously analysed materials, competencies and learning objectives. The designs made are the designs for the cartoon art (see Figure 2) and the storyline (see Figure 3). Cartoon characters are adapted to the student environment such as teachers, principals and community leaders. The storyline is used as a story guide in CALM, which consists of conflict resolution.
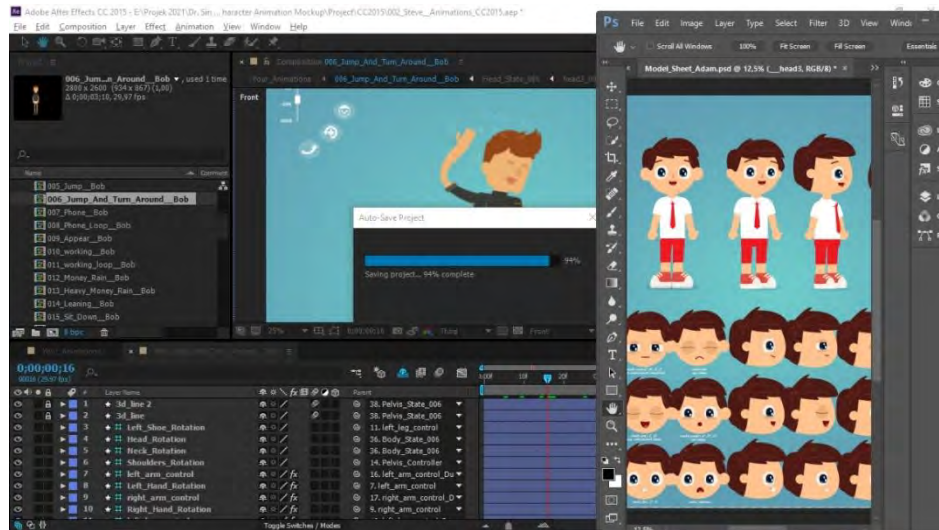
Figure 2. The design of the cartoon characters for CALM

Hello everyone, how are you? Introduce me my name is Aldi, now I want to explain to you what conflict is? Does anyone here know what conflict is? If you do not know, listen well, Aldi wants to explain.

As students at SDN A, surely, you are taught by your teachers about harmony in the classroom or outside of school, the goal is that we do not create a dispute.

Well, the conflict itself is a dispute that arises in various circumstances because of disagreements, contradictions, and differences between two or more parties.

What do you think is the cause? It turns out that there is a theory that explains this phenomenon; this theory describes how our identity is formed based on the groups that are close to us. So everyone likes groups, for example, we meet a group of people who are from the same class or extracurricular, have the same hobbies or the same activities. When we meet, this group becomes a source of our pride and self-esteem.

When the identity of this group is deeply embedded in our lives, usually we will think, if our group is the best, not infrequently this is done by comparing with other groups and even badmouthing other groups. In the end, because of this, many groups did not like each other and there was a dispute.

Figure 3. The storyline of the CALM

### 3.3. Developing

In the developing stage, we develop CALM based on the design that has been made. The CALM was made using Adobe After Effects, Adobe Photoshop and Adobe Premiere Pro software. An example of the results of CALM development can be seen in Figure 4.
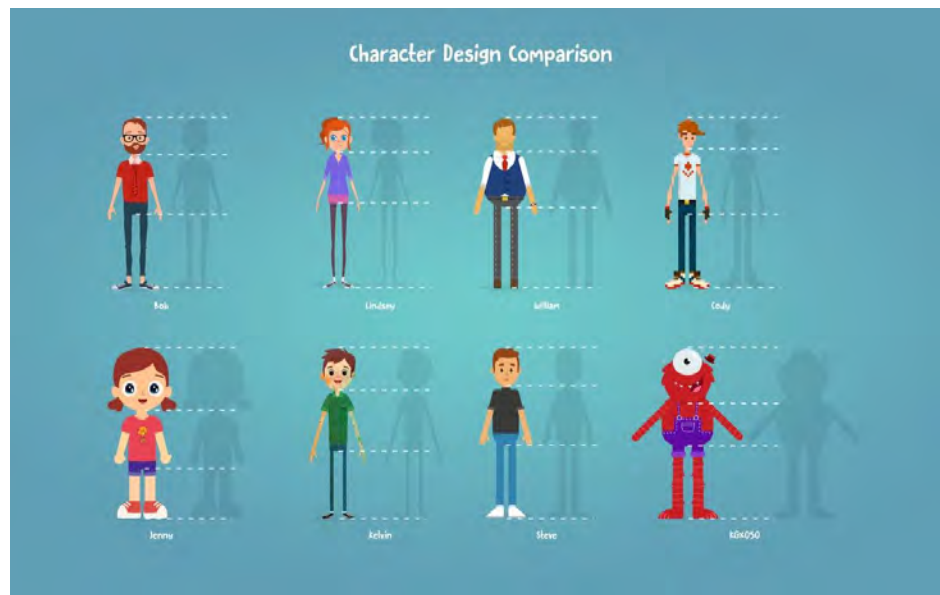
Figure 4. The example of CALM development

## 3.4. Implementing

At the implementing stage, we implemented the results of the CALM development for fifth grade elementary school students. This implementation was carried out twice. The first trial was conducted with 27 students. The purpose of this first trial was to identify the shortcomings of the developed product. The second trial was a broad test conducted with 43 students. The purpose of the second trial was to see the effectiveness of CALM development.

## 3.5. Evaluating

In the evaluating stage, we evaluated the development of CALM by looking at the validation and test results.

### 3.5.1. Experts' validation for design and subject matter

The result of experts' validation for learning materials was 76%. After revision, experts' validation reached 90%. When adjusted to the media eligibility criteria table, this score is included in the 'very valid' criteria. Suggestions from material experts stated that in general the material is in accordance with the existing core competencies and basic competencies; the concepts outlined in the learning media are very good. The results of the assessment by learning design experts included aspects of physical appearance, attractiveness, accuracy of design use, conformity of format, presentation with target characteristics, clarity of media instructions and material exposure and suitability of evaluation with material. The overall result showed that the level of achievement was 82% at stage 1 and 94% at stage 2 in the 'very valid' category. The results of the media design expert's assessment had the following comments: (a) the cartoon design is good and there is an Indonesian element; (b) it is necessary to add a cartoon learning guide regarding students' conflict resolution; and (c) it is necessary to evaluate each story. The conclusion from the assessment, comments and suggestions of learning media and design experts determined that cartoon art media deserves to be tested in the field with revisions.

### 3.5.2. First trial results

The first trial was conducted with 27 fifth-grade students. The result of the questionnaire with responses and the CALM assessment on the overall questionnaire was 82% (very valid). In addition, pre-test and post-test were also conducted to see students' conflict resolution skills, as shown in Figure 5.
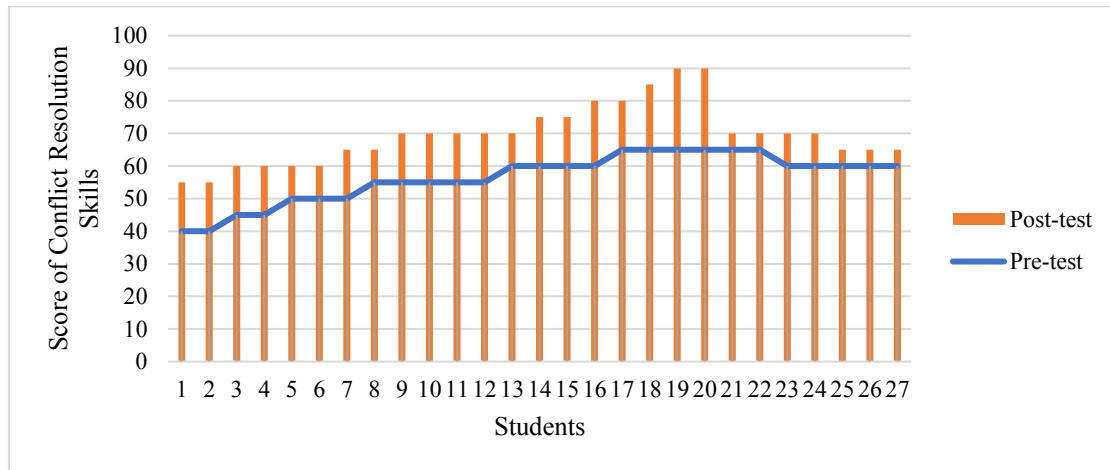


Figure 5. The results of pre-test and post-test scores for students' conflict resolution skills in the first trial

From the test results, the average pre-test score was 56.5 and the post-test was 69.6. Other than that, from Figure 5, it can be seen that the pre-test score is lower than the post-test score in the first trial.

### 3.5.3. Second trial results

The second trial was conducted with 43 fifth-grade students. The result of the questionnaire with responses and the CALM assessment on the overall questionnaire was 93% (very valid). In addition, pre-test and post-test were also conducted to see students' conflict resolution skills, as shown in Figure 6.
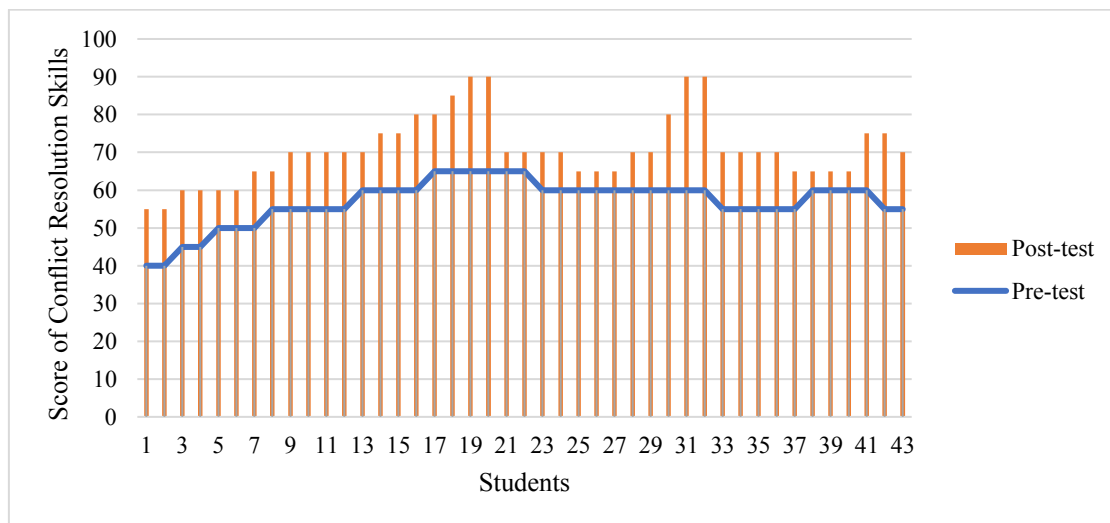


Figure 6. The results of pre-test and post-test scores for students' conflict resolution skills in the second trial

From the test results, the average pre-test score was 60.0 and the post-test was 70.7. Other than that, from Figure 6, it can be seen that the pre-test score is lower than the post-test score in the second trial. Furthermore, calculations were carried out using the t-Test Paired Two Sample for Means to see the difference in the results of the second trial, and the results obtained are presented in Table 2.

Table 2. The results of the paired two-sample *t*-test for the mean

| t-Test: Paired Two Sample for Means | | |
|---|---|---|
| | Variable 1 | Variable 2 |
| Mean | 70.69767442 | 56.97674419 |
| Variance | 78.0730897 | 38.26135105 |
| Observations | 43 | 43 |
| Pearson's correlation | 0.692958971 | |
| Hypothesised mean difference | 0 | |
| df | 42 | |
| *t*-Stat | 14.12292554 | |
| $P(T<=t)$ one-tailed | 7.49443E-18 | |
| *t*-Critical one-tailed | 1.681952357 | |
| $P(T<=t)$ two-tailed | 1.49889E-17 | |
| *t*-Critical two-tailed | 2.018081703 | |

Based on the results of the t-Test Paired Two Sample for Means, the obtained *t*-Stat 14.1 is greater than *t*-Table 2.01, which means that the cartoon art media containing students' conflict resolution learning materials is declared effective.

## 4. Discussion

CALM was developed with the aim of presenting learning media that can improve the conflict resolution skills of elementary school students. It was developed according to the ADDIE model. At the analysing stage, an analysis is carried out related to the subject matter, core and basic competencies and learning objectives. The selected subject matter is the environmental theme. One of the reasons for choosing the environmental theme is that there is a discussion about human behaviour. This is consistent with the conflict resolution raised and the importance of environmental material for elementary school students (Sedawi et al., 2014; Upadhyay & DeFranco, 2008). The purpose of this analysis stage is to provide the basis for creating the CALM design.

In the designing stage, cartoon characters and storyline designs are created. The storyline in media development is very necessary as a guide for making media (Roth et al., 2017), especially when experts (not researchers) in the field develop the media. After that, CALM is developed according to the design that has been made. CALM development using Adobe After Effects, Adobe Photoshop and Adobe Premiere Pro software. The CALM that has been developed is then validated and tested to obtain ideas for the suitability of the educational media with the material and learning objectives.

In the evaluation stage, each expert evaluates each indicator contained in the validation sheet; media validation is in the form of a quantitative descriptive assessment questionnaire that is disclosed in the score distributor and the rating scale category. The results of expert validation for the design and subject matter showed that CALM was valid for use but with several revisions. The material expert suggested improving conversations in simple languages that students can understand. Therefore, the researchers made improvements and re-validated the design with the subject matter experts. After making improvements, the results obtained were very valid. Indicating that CALM can be used.

CALM has been tested twice after being declared very valid. The first trial (small trial) was conducted on 27 fifth-grade elementary school students. This trial is related to students' responses and conflict resolution ability tests before (pre-test) and after (post-test) using CALM. The results obtained from the first trial showed very good responses to CALM and an increase in scores from pre-test to post-test. From the first trial, several suggestions for improvement were also obtained. After making improvements, a second trial was conducted on 43 fifth grade elementary school students (large trial). The results of the second trial showed very good responses and an increase in the pre-test to post-test scores.

Furthermore, calculations were also carried out for the paired two-sample *t*-test for the means. The t-Test Paired Two Sample for Means used to see the difference in the results (Huang & Li, 2015; Lin et al., 2021). The results show that CALM is effectively used to improve students' conflict resolution skills. This indicates that CALM can improve the conflict resolution skills of elementary school students. This is in line with Mcvicker (2018) findings that the use of comics can support the development of deductive reasoning, judgmental thinking, and learning skills as a stimulus for creative writing, conflict resolution, and so on. Uses comics as a tool to help teachers shape characters and improve children's interpersonal intelligence during learning at school (Mills et al., 2013; Novak, 2015). Comics are a learning medium that is used as a tool to help teachers during the learning process, which has characters so that students are happy to read them.

## 5. Conclusion

From the results of the research that has been carried out, it can be concluded that the development of CALM can be complete using the ADDIE model. The results of CALM development can be used to improve children' conflict resolution skills. In addition, the Covid-19 pandemic has also had a major impact on education (Egan et al., 2021; Wei et al., 2021; Yıldırım, 2021). Learning is carried out using online media during the pandemic. Teachers must ensure that teaching and learning activities continue, even though students are at home. In this case, teachers are required to be creative in designing learning media as innovations by utilising online media (Fontenelle-Tereshchuk, 2021). This Covid-19 pandemic period can be said to be an opportunity in the world of education because of, both the use of technology in line with industry 4.0 (Akyuz & Keser, 2015; Astra et al., 2015; Senen et al., 2021; Supriyatno et al., 2020) and parents as mentors. The hope is that after the Covid-19 pandemic, we will become accustomed to the current system as a learning culture in education. The development of CALM can be an alternative for online learning media during the pandemic, where students can still easily understand the media used.

## 6. Recommendations

Furthermore, researchers can also develop learning media in the form of cartoon art for different subject matter. The learning media developed can be oriented towards other abilities needed for this era. Other than that, researchers should still be adapted to a child's cognitive development.

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