



Improving Conceptual Knowledge in Elementary School Students with Revised Bloom's Taxonomy-Oriented Learning Activities

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ABSTRAK

Kurangnya perencanaan dalam pelaksanaan aktivitas pembelajaran membuat proses pembelajaran menjadi kurang menarik untuk siswa sehingga membuat siswa tidak dapat mengikuti pembelajaran dengan baik. Tujuan penelitian ini adalah untuk menganalisis aktivitas pembelajaran berorientasi taksonomi bloom revisi untuk meningkatkan kemampuan pengetahuan konseptual siswa kelas IV sekolah dasar. Jenis penelitian ini adalah penelitian pengembangan. Subjek pada penelitian ini melibatkan 4 orang dosen serta 37 orang siswa. 4 orang dosen yang menjadi subjek pada penelitian ini terbagai menjadi 2 ahli yaitu ahli media pembelajaran dan 2 ahli isi. Metode pengumpulan data dengan wawancara, pencatatan dokumen, tes, dan kuesioner yang bertipe rating scale. Analisis data menggunakan teknik analisis deskriptif dan inferensial (Uji-t). Hasil pengembangan menunjukkan bahwa aktivitas yang dikembangkan telah dinyatakan valid berdasarkan penilaian para ahli. Hasil pengujian efektivitas dengan uji-t Independent sample Tes berbantuan SPSS 17.0 for windows menunjukkan bahwa bahwa signifikansi (2-tailed) 0,00 kurang 0,05. Simpulan menunjukkan terdapat pengaruh yang signifikan aktivitas pembelajaran berorientasi Taksonomi Bloom Revisi terhadap kemampuan pengetahuan konseptual siswa kelas IV sekolah dasar. Implikasi dalam penelitian ini yaitu aktivitas pembelajaran yang tersusun dengan rapi ini dapat dimanfaatkan oleh guru dalam rangka membuat proses pembelajaran menjadi lebih efektif adanya.

ABSTRACT

Lack of planning in implementing learning activities makes learning less attractive, so students cannot follow the lesson properly. This study aimed to develop revised Bloom taxonomy-oriented learning activities to improve the conceptual knowledge skills of fourth-grade elementary school students. This type of research is development research. The subjects in this study involved four lecturers and 37 students. The four lecturers who were the subjects of this research were divided into two experts, namely learning media experts and two content experts. Interviews, document recordings, tests, and questionnaires of the rating scale type. Furthermore, it was analyzed using descriptive and inferential analysis techniques (t-test). The development results show that the activities developed have been declared valid based on the judgment of the experts—the results of testing the effectiveness with the Independent sample t-test. The SPSS 17.0 for windows assisted test shows that the significance (2-tailed) is 0.00 < 0.05, so H₀ is rejected and H₁ is accepted. Thus it can be concluded that learning activities oriented to the Revised Bloom's Taxonomy significantly influence the conceptual knowledge abilities of fourth-grade elementary school students. This research implies that this neatly arranged learning activity can be utilized by teachers to make the learning process more effective.

1. INTRODUCTION

Education is important because quality education will create superior and competitive human resources (Murtafiah, 2022; Rifa Hanifa Mardhiyah et al., 2021). Education is important in educating the nation's life to develop skills useful in society (Murtafiah, 2022; Rifa Hanifa Mardhiyah et al., 2021). The role of education is so important for the progress of a country. The government has taken strategic steps

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to realize national education goals by providing learning infrastructure, regularly reviewing the applicable curriculum, and providing education and training for teachers to increase their professionalism (Irawan, 2022; Murtafiah, 2022). The role of the teacher in education can be likened to that of a manager in a company (Fitri Wahyuni & Binti Maunah, 2021; Sirait & Neliwati, 2022). The success or failure of a company depends heavily on the manager's ability to coordinate its employees, and the success of education depends very much on how a teacher learns in class (Kahfi, 2020; Syamsul, 2017). Teachers have a role in preparing the learning process, implementing, and providing follow-up (Zulfakar et al., 2020). Preparing learning starts from determining learning objectives, strategies, models, and media to compiling learning evaluations. Preparing the learning process is to create effective learning (Huda, 2020; Saifulloh & Darwis, 2020). The learning process is effective if students are mentally, physically, and socially involved. Students will be actively involved in the learning process if the learning is considered interesting and meaningful by students (Arviani & Fajriyah, 2018; Fiteriani & Baharudin, 2017). The learning atmosphere is interesting and makes students actively involved in the learning process so that the material being learned feels memorable that it will stick in the memory of students for a long time and, in the end, have a positive effect on improving student learning outcomes (Marpaung & Cendana, 2020; Pour et al., 2018).

However, in reality, in the learning process that has been carried out in the field, it is still widely seen that teachers rarely make or design teaching materials that will be used in the learning process (Yustianingsih et al., 2017; Zagoto & Dakhi, 2018). In the learning process activities, the teacher sometimes only explains the material contained in the textbook to students without using tools or the lecture method only (Dewi et al., 2019; Melani et al., 2021). In this lesson, students only listen to the teacher's explanations (Rahmah, 2022). It is by the results of observations that have been made before. In the observation activities that have been carried out, it is known that the learning process is still teacher-centered. Students only listen to the teacher explain. Students seem less enthusiastic about participating in learning, as indicated by the need for more interaction from students to ask questions. The results of the interviews obtained that there were problems in learning activities, such as students who were slow to understand what was explained by the teacher. Hence, the teacher had to explain the material being studied many times so that it impacted students who were also less able to solve a problem. After doing the analysis, it turns out that the cause of the less-than-optimal learning process is the result of the less-than-optimal preparation of the learning plan. It greatly impacts the low student learning outcomes. Therefore it is very necessary to improve the learning process carried out in the classroom so that learning can achieve predetermined learning objectives.

One solution that can be done to overcome the above problems is to develop learning activities that can attract students' interest in the learning process so that it will facilitate the delivery of knowledge to students. Learning activity is a process of providing learning experiences to students through a series of planned activities so that students gain knowledge about the material being studied (Koten et al., 2022). Planning learning activities that are better or planned according to the needs of students at school can make the learning process run even better so that students get a quality learning experience. The existence of learning activities in the classroom as alternative learning is more effective (Jampel & Puspita, 2017). In this study, Bloom's Taxonomy will be used to explore students' conceptual knowledge. Conceptual knowledge is knowledge incorporated from pieces of information in the form of facts, skills, and concepts, which can be seen as a network of knowledge related to one another (Afifah & Gunawan, 2022).

The learning process oriented toward the Revised Bloom's Taxonomy is expected to provide a systematic learning experience for students according to their stage of cognitive development (Netriwati, 2018; Nursa'adah et al., 2016). The learning process that is carried out systematically by referring to students' cognitive development stage will make it easier for students to learn and make the learning process more meaningful (Budiasa & Gading, 2020; Pujawan et al., 2022). Several studies also show that applying the Revised Bloom's Taxonomy in learning can improve student learning outcomes (Netriwati, 2018; Humaira, 2017). Learning activities based on Revised Bloom's Taxonomy can train curiosity and self-confidence and improve students' problem-solving skills (Wiranata et al., 2021). HOTS-based teaching materials can improve problem-solving skills in mathematics (Hamdi et al., 2018; Waite et al., 2020). Therefore, the learning process oriented toward the Revised Bloom's Taxonomy is expected to improve students' conceptual knowledge abilities. This study aimed to discover that revised Bloom taxonomy-oriented learning activities affected the conceptual knowledge abilities of fourth-grade students in GUGus IV, Gianyar District, Gianyar Regency 2020/2021.

2. METHOD

This learning activity is developed to improve the factual abilities of fourth-grade elementary school students. This research was conducted based on the 4D development research model, which has four implementation stages: define, design, develop, and disseminate. This research was initiated by carrying out the defining stage, which aims to explain and interpret the development of the underlying learning activities to research the development of elementary learning activities. At this stage, several analyses were carried out: activity analysis, proda and promissory note analysis, and lesson plan analysis. The next stage is the design stage which is the stage that aims to design the design of the learning activities developed in this study. This stage includes designing learning activities, compiling learning activities, and making items. The third stage in this research is the development stage which is the testing stage of what is developed in this study. At this stage, it includes several activities carried out, including the production or preparation of learning activities that have been developed, the implementation of learning activities that have been prepared, and an evaluation of the implementation and all stages that have been carried out. The dissemination stage is the closing stage in this development research. It is the stage where learning activities that have been compiled and tested are carried out to be used optimally to support the learning process. The development research scheme using the 4D model is presented in Figure 1.

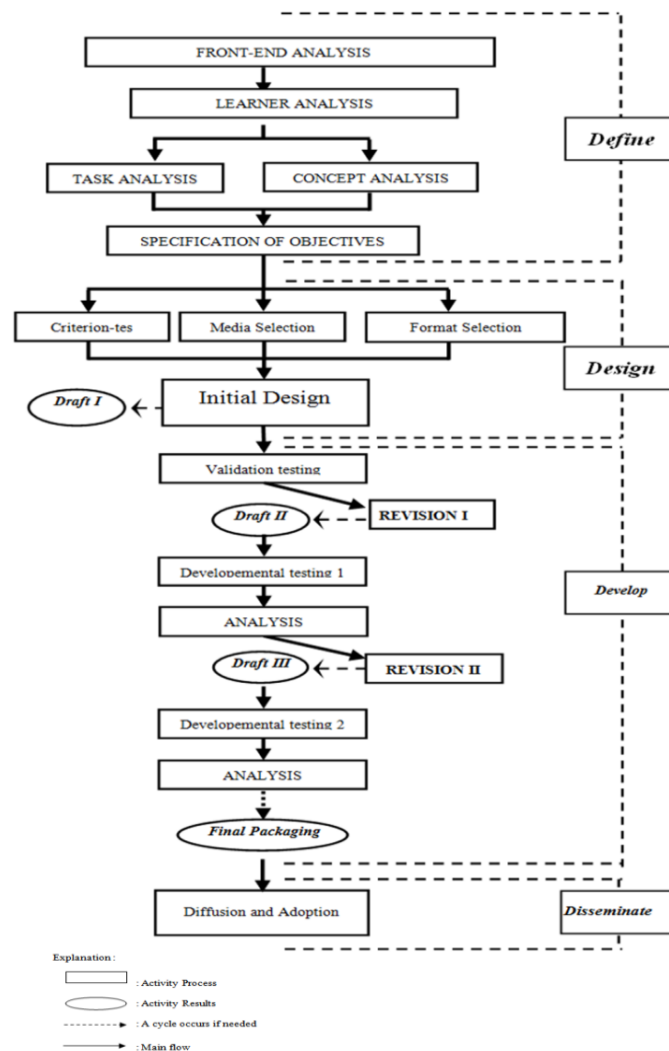


Figure 1. 4D Development Research Scheme

The subjects in this study involved four lecturers and 37 students. The four lecturers who were the subjects of this research were divided into two experts, namely learning media experts and two content experts. The learning media expert is a lecturer from the Ganesha University of Education who is competent in preparing learning media, especially for elementary schools. At the same time, content experts are lecturers from the Ganesha University of Education who have competence in learning

analytics and learning processes, especially at the elementary school level. The 37 students who were the subject of this development research were a sample of students currently studying elementary school in the fourth grade of 7 schools which were population in this development research. The population is then subjected to an equivalence test to determine the sample. The sample was then selected using a random sampling technique. Samples were selected from 2 schools, with the number of fourth-grade students from each school totaling 21 people and 16 students, so this study uses student subjects of as many as 37 students. Research on developing learning activities oriented to this revised Bloom taxonomy uses data collection methods: interviews, document recording, and tests. The instrument used in this study was a questionnaire with a rating scale type. The rating scale is a questionnaire that can be used to assess the product being developed, with a rating scale of 1-5. The preparation of the research instrument was carried out by first compiling a grid. These indicators are modified into statements in the table derived from active learning theory. Active learning or active learning provides nuances of learning that can provide broad opportunities between teachers and students. The instrument grids used in this development research are presented in [Table 1](#), [Table 2](#), and [Table 3](#).

Table 1. Learning Activity Assessment Instruments

NO	Aspect	Component	Number of Items
1	The learning process is student-centered	1, 2	2
2	Suitability of learning activities	3, 4, 5	3
3	Exploring New Knowledge in Learning	6,7	2
4	Learning activities that build student independence	8,9	2
5	Selection of learning media in learning activities	10, 11	2
6	There is Interaction in Learning Activities	12, 13, 14	3
7	Physical and Sensory Engagement of Students in Learning	15, 16	2

Table 2. Teacher and Student Response Test Instruments

No.	Indicator	Item Number	Number of Questions
1.	Student-centered learning	1,2	2
2.	Suitability of learning activities with the dimensions of the objectives	3,4,5	3
3.	Make discoveries in learning	6,7	2
4.	Learning activities allow student independence	8,9	2
5.	There are various uses of learning media	10,11	2
6.	Physical Involvement in Learning	12,13	2
7.	There is social interaction in the learning process	14,15,16	3

(Wiranata et al., 2021)

Table 3. Conceptual Knowledge Test Instrument

No.	Basic competencies	Question Indicator	Cognitive Domain	Question Number	Question Form	Number of Questions
1	3.3 Identify the various forces, including muscle force, electrical force, magnetic force, gravitational force, and frictional force	Students can determine the steps to play darts and catapult correctly	C3	1,2,3	Essay	4
		Presented in the table, students are asked to determine style changes	C3	5	Essay	1
		Presented in the table, students are asked to determine examples of style changes.	C3	6	Essay	1
	4.4 Presenting experimental results about the relationship between force and motion	Presented pictures and text, students can sequence the steps of kicking and stopping the ball correctly.	C3	10,11,12,13	Essay	4

No.	Basic competencies	Question Indicator	Cognitive Domain	Question Number	Question Form	Number of Questions
2	3.2 Knowing three-dimensional images and shapes	Students can distinguish the stages of making three-dimensional images correctly.	C4	8,9	Essay	2
3	3.4 explain the benefits of the diversity of individual characteristics in everyday life	Presented questions, students can determine the steps taken in compiling reports on observations about the diversity of individual characteristics correctly.	C3	15	Essay	1
4	3.7 Observing the characters in fictional texts	Presented questions, students can provide an assessment of the steps of the character of a fictional character correctly.	C5	14	Essay	1
		Describe the characters contained in the fiction text accurately	C4	16,17,18,19,20	Essay	5
5	4.4 Make a picture story	Presented questions, students can arrange the steps to make a story picture correctly.	C6	7	Essay	1

(Wiranata et al., 2021)

A good instrument is an instrument that can fulfill the requirements of the validity test. A test is a description test that meets the requirements from the content validity, item validity, reliability, and test difficulty level. The instrument used in this study has been tested to meet the requirements of a good instrument. The learning activity instrument has been tested for the validity of the instrument items by using the CVR (Content Validity Ratio) formula. The results obtained in this test validate each instrument item in the CVR (Content Validity Ratio) formula. According to Anzwar, all learning activity instrument items are declared valid. In addition, the learning activity instrument was also tested for content validity which was analyzed using the CVI (Content Validity Index) formula. The CVI (Content Validity Index) value is 1 based on the calculations. So that according to the CVI (Content Validity Index) criteria, the validation of the entire instrument in the CVI (Content Validity Index) formula indicates that the learning activity instrument is very good. Test instruments used in this study were also tested, including testing the validity of the test items, testing the validity of the test, testing the reliability of the test, and testing the test's difficulty level. All learning activity instrument items are declared valid based on the validation provisions for each instrument item in the CVR (Content Validity Ratio) formula. Based on the calculations, the CVI (Content Validity Index) value is 1 (Ariani & Ujjianti, 2021). So that according to the CVI (Content Validity Index) criteria, the validation of the entire instrument in the CVI (Content Validity Index) formula states that the learning activity instrument is very good. The result of the calculation is 0.60. It can be concluded that the reliability of the conceptual knowledge test is at high criteria. This is because the price of r_{11} obtained is 0.60 and is in the range of $0.60 < r_{11} \leq 1.00$. Based on these calculations, a Pp value of 0.50 is obtained. So when converted into the criteria for the difficulty level of the test, it can be concluded that the procedural knowledge test kit is in the medium criteria.

The data analysis method used in this study is a qualitative descriptive analysis method, a quantitative descriptive analysis method, and an inferential statistical analysis method. The qualitative descriptive analysis method analyzes or processes data by systematically compiling sentences/words and categories regarding an object to obtain a general conclusion (Agung, 2014). This qualitative descriptive analysis technique is used to process the data from the trial results of learning media experts and students. This data analysis technique was carried out by grouping information from qualitative data in the form of input, responses, criticism, and suggestions for improvement contained in the questionnaire. The results of this analysis are then used to revise the product being developed. Quantitative descriptive analysis is a way of processing data by systematically compiling figures and or presentations regarding an object under study to obtain general conclusions (Agung, 2014). In this study, quantitative descriptive analysis was used. This study used quantitative descriptive analysis to analyze the content validity of the developed learning activities and the average score of the experimental and control classes. This analysis aims to find out the average of the expert assessment sheets. The scores obtained according to the criteria

are then calculated on average to find the content validity of the learning activities being developed. Analysis of the average score of the control class aims to determine the average score obtained by students in the control class. In contrast, the analysis of the average score of the experimental class aims to determine the average score obtained by students in the experimental class. Inferential statistical analysis was used to determine the increase in procedural knowledge skills in the control and experimental classes. The test results were then analyzed using the t-test to determine the difference between the results obtained by the control and experimental classes. This prerequisite test is carried out to prove the normality and homogeneity of data types so that a hypothesis test can be carried out (independent t-test).

3. RESULT AND DISCUSSION

Result

This research begins with the definition stage. The defining stage consists of several stages: needs analysis, learning activity analysis, syllabus analysis, and prota promissory analysis. The needs analysis is carried out by analyzing the learning activities that have been carried out in elementary schools. In the needs analysis, it is known that several problems in the learning process could be more optimal. During the learning process, the teacher still dominates learning through lectures by occasionally giving students to ask questions. The learning outcomes, especially students' conceptual knowledge, were relatively low. In addition, it was found that the learning that has taken place so far has yet to facilitate the development of students' conceptual knowledge optimally. At this stage, an analysis of learning activities is also carried out, which is known to be a problem. The teacher still dominates learning and is a source of information. No visible learning process facilitates students to build their knowledge, such as reading activities, discussing, conducting experiments, and presenting their work. It is a factor causing students' low conceptual knowledge. Syllabus analysis is carried out to determine basic competencies, Competency Achievement Indicators (GPA), and Learning objectives that must be achieved in the process. At this stage, the annual program design and semester program analysis are carried out in the learning process. In this study, prota and promissory note analyses were carried out to determine the theme taken.

The next stage is the design stage. This stage consists of several stages: designing learning activity prototypes oriented to the Revised Bloom's Taxonomy, designing learning activities, and designing conceptual knowledge breakdown questions. The stage of designing a learning activity prototype oriented to the Revised Bloom's Taxonomy with the conceptual dimension of knowledge and the cognitive dimension includes the processes of remembering, understanding, applying, analyzing, evaluating, and creating. Then proceed with designing learning activities. The design of learning activities consists of 6 activities according to the cognitive and knowledge dimensions. The activities developed include remembering conceptual knowledge, understanding conceptual knowledge, applying conceptual knowledge, analyzing conceptual knowledge, evaluating conceptual knowledge, and creating conceptual knowledge. The next stage is designing conceptual knowledge description questions. This stage aims to produce conceptual knowledge description questions, which will later be used to measure the effectiveness of learning activities that have been made and practiced. In this case, it is a learning activity oriented to the Revised Bloom's Taxonomy.

The third stage in this development research is the development stage, which is divided into three implementation stages: the production stage, the implementation stage, and the evaluation stage. This stage is the first process, namely making learning activities oriented to the Revised Bloom's Taxonomy. Learning activities consist of tables of cognitive process and knowledge dimensions, learning activity identities, core activities, and descriptions of learning activities. The following is a description of the process of making learning activities. The implementation stage was carried out after a validation test of learning activities by content experts consisting of 4 lecturers who were experts in the content of learning activities, teacher response tests to 2 teachers, and student response tests to 3 students. After the learning activity is declared valid, then proceed with implementing the learning activity in the selected elementary school. Learning activities were implemented six times according to the number of activities designed at SD Negeri 2 Samplangan, which was selected as the experimental class. After implementing the six learning activities, in the final stage, students will be described with conceptual knowledge that has been compiled and validated previously. The results of the content validation data analysis of learning activities show that the validity index of content experts in learning activities obtains the highest score of 4.56. It shows that this range is included in the very good category. Thus, the Revised Bloom's Taxonomy Oriented Learning Activities to Improve Conceptual Knowledge Ability can be declared valid. Content validity got a score of 4.54. It shows that this range is included in the very good category. Thus, the Revised Bloom's Taxonomy Oriented Learning Activities to Improve Conceptual Knowledge Ability can be declared valid.

While the results of the homogeneity test show that the significance value is $0.864 > 0.05$, it can be concluded that the post-test data on the conceptual abilities of the experimental and control groups are homogeneous. At the evaluation stage, an assessment or evaluation and revision of the learning activity products are implemented by consulting the supervising lecturer. The dissemination stage is the final stage of the things done in this development research. This stage is to provide learning activity products to teachers. With the development of learning activities oriented to the Revised Bloom's Taxonomy, it is hoped that it will assist teachers in developing innovation in the learning process.

Discussion

Research that produces a learning activity product-oriented to Revise Bloom's Taxonomy to improve students' factual knowledge abilities. This learning activity was developed to increase the factual abilities of fourth-grade elementary school students. This research was conducted based on the 4D development research model, which has four implementation stages: define, design, develop, and disseminate (Noprinda & Soleh, 2019; Utomo, 2021). The selection of the use of the 4D development research model is based on this research model having simple stages in its implementation, and this development model can develop products in the form of books or teaching materials in a systematic way (Noprinda & Soleh, 2019; Saptaria & Setyawan, 2021).

The feasibility of developed learning activities can be viewed from several aspects: suitability with students' characteristics and cognitive level, as it is known that the level of children occupying the fourth grade is students who are still in the concrete operational stage (Et al., 2021; Ritonga & Rambe, 2022). The feasibility of developed learning activities can be viewed from several aspects, namely suitability with v. As it is known that the level of children occupying the fourth grade is students who are still in the concrete operational stage (Ndiung & Jediut, 2020; Umami et al., 2021). The existence of learning activities helps students in the learning process (Fitriasari et al., 2017; Yestiani & Zahwa, 2020). In addition, the feasibility of the developed learning activities can also be viewed from the usability aspect. As previously explained, learning activities are indicators of student success in participating in learning (Fitriasari et al., 2017; Yestiani & Zahwa, 2020). Utilization of learning activities to help students learn by memorizing the material and understanding the material through activities carried out by the students themselves. The student's enthusiasm to participate in offline learning can be seen through the application of learning. Indirectly, the development of revised Bloom's taxonomy-oriented learning can assist teachers in packaging learning to be more effective, varied, and innovative. The success of learning, which is marked by an increase in the APKG value and student learning activity scores, as explained in the previous discussion, results in an optimal learning process and, of course, has an impact on improving student learning outcomes.

The feasibility and effectiveness of the development of learning activities are developed by the results of research conducted, which uses learning activities in the classroom as alternative learning to be more effective (Jampel & Puspita, 2017). This research also shows that children's abilities in remembering, understanding, applying, analyzing, evaluating, and creating increase if learning innovations are given. Learning must be able to support students to carry out activities because activities can affect learning outcomes (Ayuwanti, 2017). In addition, learning activities that have invited students to study independently and in groups are active and meaningful. Students are more active and courageous in expressing their curiosity through questions and opinions to increase activity and learning outcomes (Widiantono, 2017). Learning activities that direct students to learn to know factual knowledge can invite students to learn more actively, and learning lies in the students. The student-centered learning process is expected to provide a new color for students. It is also easier for teachers to organize learning in stages according to students' cognitive development and the dimensions of student knowledge, especially factual knowledge. After the teacher's learning activities are easier to design learning. The teacher classifies basic competencies. Then the teacher determines the appropriate indicators.

Applying the Revised Bloom's Taxonomy in the learning process can improve student learning outcomes (Netriwati, 2018; Humaira, 2017). Learning activities based on Revised Bloom's Taxonomy can train curiosity and self-confidence and improve students' problem-solving skills (Wiranata et al., 2021). HOTS-based teaching materials can improve problem-solving skills in mathematics (Hamdi et al., 2018; Waite et al., 2020). Based on the discussion, the implication in this study is that the teacher can utilize this neatly arranged learning activity to make the learning process more effective. The teacher carries out learning without the help of the lesson plan. It is because the learning activities have been briefly structured regarding the activities in the lesson plan. The teacher also conveys the facilities needed to implement learning activities to the principal. Therefore, the school agreed to prepare additional teaching materials, Student Worksheets. The school principal also appealed to students to meet virtually 1-2 times a week.

4. CONCLUSION

Revised Bloom's Taxonomy-oriented learning activities to improve students' factual knowledge skills developed in this study have been adapted to elementary school students' characteristics and cognitive levels. So that learning activities are oriented to the Revised Bloom's Taxonomy to improve students' factual knowledge abilities. In addition, the teacher to make the learning process more effective. Learning activities that direct students to learn to know factual knowledge can invite students to learn more actively, and learning lies in the students.

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