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# Improving Vocational Skills Through a Computational Thinking Approach for Mildly Disabled Children

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## *Abstract*

This study aims to improve the vocational skills of making chocolate tempeh for seventh grade tunagrahita children by using the computational thinking learning model. The basic concepts of computational thinking are decomposition, pattern recognition, abstraction and algorithms. This study uses a class action research method, which consists of 2 cycles with each cycle having stages of planning, action, observation, reflection. The subjects of this study were mild impairment students of class VII at SLB C Wiyata Dharma 2 Sleman, totaling 4 students. Data were obtained by means of observation, performance tests and interviews. The results of observation were analyzed descriptively qualitative while the results of student practice were assessed quantitatively. The results of this study indicate that the skills of making tempeh chocolate for mildly disabled children have increased after the action. In the initial condition, the four students in the skill of making chocolate tempeh had not yet reached the set criteria. After the action in cycle I there was an increase in the achievement of the average score of 16.11, but there was one student who had not reached the minimum completion score and all students were not able to make chocolate tempeh independently. In cycle II there was an increase in the achievement of an average score of 22.77, all students had reached the minimum completeness score. Based on this data, it can be concluded that the computational thinking learning approach can improve the skills of making tempeh chocolate in mild tunagrahita children in class VII at SLB C Wiyata Dharma 2 Sleman.

***Keywords:*** *Mildly Impaired Children; Computational Thinking Learning Approach*

## *Introduction*

Mildly retarded children are children who have an intelligence level below the normal average who have different characteristics from children in general. These children have low intellectual abilities but have the modality of repeating one type of work and if trained continuously, they will be able to be independent in developing their life skills. Mildly retarded children need life skills education services implemented in vocational learning as a support for independence in everyday life. Vocational learning is developed in accordance with the competencies possessed by mildly retarded children. Vocational skills can be simplified in the sense that complex vocational skills can be simplified into smaller and more detailed sub-subs. So that these vocational skills can be reached or absorbed by mildly deaf children.

Seeing these characteristics, teachers must be able to carry out assessments so that they can identify the strengths and weaknesses in detail of each student. This will make it easier for teachers to plan follow-up. In designing and implementing follow-up programs, teachers must be able to understand the curriculum developed by the school and implemented in the implementation of learning that is tailored to the abilities and potential of students. One of the efforts in meeting the needs of mildly disabled students is to create a pleasant and meaningful learning climate. This is where teachers must be able to select and sort out materials and components of vocational learning for the SMPLB education level whose development is based on the competencies possessed by students and their needs. In addition to being based on the competencies and needs of students, the development of vocational skills is directed at the competencies of the characteristics of the local area (local wisdom). The local environment conditions are found a lot of tempe which is one of Indonesia's typical foods. This research focuses on vocational learning activities to make tempe chocolate.

Tempe chocolate is a processed food made from local tempeh modified with chocolate. Mildly disabled children are familiar with tempeh. However, the less creative processing of tempeh makes mild tunagrahita children feel bored. One of the alternatives developed by the teacher is the vocational learning of making tempeh chocolate based on the results of the assessment, namely children have good fine motor skills and students have been able to make tempeh mendoan and tempeh balls. This chocolate tempe has advantages including chocolate tempe can last a long time, the manufacturing process is not complicated and the long-term goal of this food can be used as souvenirs which will directly have a positive impact on families and communities.

Teachers carry out vocational learning of making chocolate tempe by using the drill method learning strategy but the results have not reached the criteria for the completeness of the learning objectives (KKTP) set at 75, besides that the children are also less enthusiastic and always depend on teacher guidance. This is where the teacher reflects on learning. The conclusion of the reflection results to improve the learning strategy is to use a different learning approach. The learning approach is a way that teachers do to help students learn to achieve predetermined learning goals. The implementation of the learning approach by optimizing the environment that can be developed, combined into a meaningful and enjoyable learning. So that learning can be directed in learning that is applicable, right on target, right for mildly disabled children. One of the efforts made by teachers is using a computational thinking learning approach. The computational thinking approach is the ability of skills to solve problems needed in solving everyday problems.

According to Jeannet (2021) computational thinking is the thought process needed in formulating problems and their solutions, so that these solutions can become effective information processing agents in solving problems). Computational thinking is able to encourage mildly disabled children to export their ability to solve problems. Mildly disabled children need to be trained in the process of solving problems, solving problems in their own way through challenging and fun learning. Teachers must be able to explore and explore the ability of mildly retarded children to develop their potential. Computational thinking has 4 key techniques including: (a) decomposition, which is solving complex problems into smaller parts that are simpler and easier to work on; (b) pattern recognition, which is looking for similarities between various problems presented to be solved; (c) abstraction, which is focusing on important information only and ignoring information that is considered irrelevant and (d) algorithms, which is the part that designs steps to solve problems (Anggrasari, 2021). From this explanation, this computational thinking learning approach can be described as Figure 1.

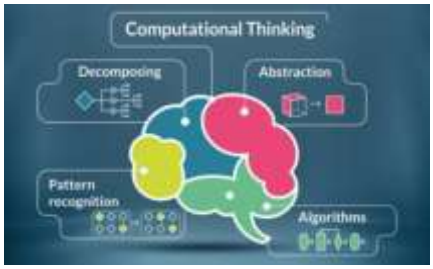



Figure 1: Computational Thinking

The computational thinking learning approach developed for Tunagrahita students in vocational learning tailored to the competencies of students is (1) decomposition, at this stage students and teachers discuss to break down complex problems into more detail, in addition to discussing teachers and students explore problems by analyzing problems into more detail (2) pattern recognition, students and teachers look for patterns of problem solving, namely looking for advantages and disadvantages of each detail of the problem, (3) abstraction, students and teachers generalize problems by drawing general conclusions about solving problems. (4) algorithm, students together with the teacher stages that contain steps that are sequenced in a complete and measurable manner.

The selection of the computational thinking learning approach was chosen because it has several advantages including (1) finding solusi masalah yang terbilang complicated, so lebih simple (2) making the search for solutions lebih efisien (3) dibutkan in the age sekarang yang per needs solusi in time yang cepat (Alifa, 2022). In addition, seeing the limitations of mild Tunagrahita children who are most likely not able to think thoroughly, computational thinking will be very helpful in breaking down problems into small and detailed patterns that will make it easier for mild Tunagrahita children to understand the subject matter of making chocolate tempeh.

From previous research proves that the computational thinking learning approach has shown a positive influence on math learning achievement for elementary school students (Annas et al, 2023). Likewise, it can also be seen from the results of a review study conducted by Anggraeni (2021) whose results show that computational thinking uses a problem-solving process that includes the characteristics of; formulating problems in a way that allows us to use computers and other tools to help solve them; managing and analyzing data logically; representing data through abstractions such as models and simulations; automating solutions through algorithmic thinking (a series of ordered steps); identifying, analyzing, and implementing possible solutions with the aim of achieving the most efficient and effective combination of steps and resources; generalizing and transferring the problem-solving process to various problems. Learning in elementary school is the right time to improve computational thinking so that students have the ability to solve problems early on. Furthermore, the results of research from Nur Azizah, et al (2023) can be seen that computational thinking can be integrated in learning by using the foundations of computational thinking in solving problems according to learning materials. Learning in this study uses the foundations of pattern recognition, abstraction, and algorithms. Learners can use these foundations as shown by 80% mastering pattern recognition skills, 72% mastering abstraction skills, and 100% mastering algorithm skills. The ability of learners to understand the learning material is also very good, indicated by 76% of learners passing the KKTP. Learners also feel happy with this computational-based learning and feel challenged by the use of foundations.

Based on this, computational thinking needs to be applied in vocational learning for mildly disabled students, it is hoped that through this computational thinking learning approach it can improve vocational learning skills, namely making chocolate tempeh. The development of a computational thinking approach to facilitate mild tunagrahita children in making tempe chocolate is from complex problems detailed into small sub-subs that make it easier for them to understand the material. computational thinking serves as an effort to explore the ability of mild tunagrahita children so as to

improve the ability of mild tunagrahita children to make tempe chocolate and the confidence and dependence of mild tunagrahita children is reduced.

The teacher will describe the vocational learning of making tempeh chocolate using the computational thinking learning approach for children with disabilities at SLB C Wiyata Dharma 2 Sleman.

## *Research Methods*

This study used a classroom action research approach. The research was conducted by the class teacher assisted by another teacher as a collaborator with the aim of improving vocational learning, so that vocational learning for mild Tunagrahita students can improve.

The research was conducted at SLB C Wiyata Dharma 2 Sleman class VII in the 2021/2022 academic year. The research was carried out in 2 cycles. Cycle 1 began on January 17 to January 31, 2022 and Cycle II from February 1 to February 21, 2022. The subjects in this study were Tunagrahita students in grade VII in the 2021/2022 academic year, totaling 4 students.

Data collection techniques in this study are test and non-test techniques. For test techniques using performance tests while non-test techniques through the first observation carried out by researchers in the form of active observation, where researchers conduct learning directly in vocational learning. Observation is focused on the implementation of vocational learning using the observation sheet instrument. Second, interviews to find out about students' interest in participating in vocational learning. Third, documentation. Data obtained from documentation studies in the form of photos that can provide an overview of the real implementation of vocational learning.

The test technique is in the form of a work performance test. The performance test was used to obtain data on the improvement of making tempeh chocolate through the computational thinking learning approach. This performance test consists of tests used to determine initial ability (pretest), posttest cycle I and posttest cycle II.

This research procedure uses classroom action research through two cycles, each cycle consisting of four steps, namely plan, action, observation, and reflection (Arikunto, Suharjono, & Supardi, 2007, p.16). Before entering the planning stage, first conduct pre-research and identify problems and formulate problems. Pre-research activities include collecting data on the value of vocational learning to make tempeh chocolate and making observations of the ability of mild tunagrahita children to learn vocational learning to find out the problems that arise when vocational learning to make tempeh chocolate takes place, resulting in low vocational learning outcomes. The next stage is to identify and formulate problems. After carrying out problem identification steps, it is known that the basic problem during vocational learning is still the low understanding of mildly disabled children in making tempeh chocolate.

The plan stage begins with designing the actions to be taken, including preparing lesson plans, preparing research instruments, planning the actions to be taken with the computational thinking approach, namely decomposition, pattern recognition, abstraction and compiling algorithms.

The action stage (action), the researcher acts as an action giver and a peer (collaborator) as an observer. The action procedures carried out with the computational thinking approach for mildly deaf children are

a. Decomposition

At the decomposition stage, teachers and students make tempeh chocolate. Tempe chocolate is made from tempeh, chocolate, sprinkles, and cooking oil. Then break it back into the stages of preparing

tools and materials, the process of frying tempeh, the process of sealing chocolate, giving toppings and packaging.

b. Pattern Recognition

Students together with the teacher learn about the pattern of the process of making tempeh chocolate from the preparation of tools and materials including the selection of appropriate tools and appropriate materials. Pattern recognition during the process of making tempeh chocolate is slicing the tempeh into small pieces, frying must be flipped so that it does not burn, the process of pengetiman chocolate must be cut into small pieces so that it melts easily, the process of mixing tempeh and chocolate: chocolate in hot conditions because if the chocolate has dried it does not stick. At the time of packaging the tempeh chocolate is allowed to dry so that it is easy to pack using mica.

C. Abstraction

Students together with the teacher determine the recipe for tempeh chocolate as follows Ingredients: 75 grams of chocolate bar, 100 grams of tempeh, a teaspoon of springkel, enough cooking oil. Tools: Wok, sotel, serok, telenan, knife, stove, panic. The steps to make tempeh chocolate are (1) prepare the tools, (2) prepare the ingredients, (3) slice the tempeh thinly, (4) fry the tempeh until it turns yellow, (5) remove the tempeh, (6) drain the tempeh, (7) slice the chocolate thinly, (8) melt the chocolate until it melts, (9) remove the melted chocolate, (10) pour the tempeh into the chocolate, (11) stir the chocolate and tempeh until evenly distributed, (12) pour the tempeh chocolate into the cup case, (13) sprinkle the tempeh chocolate with springkel, (14) let the tempeh chocolate sit for about 2 hours, (15) pack the tempeh chocolate with mica. Students practice making chocolate tempe according to the steps agreed upon.

d. Algorithms

In the algorithms stage, it is designing a scheme of steps to make tempeh chocolate to facilitate the practice of making tempeh chocolate. Students and teachers discuss to make a scheme of steps to make tempeh chocolate. The design of the algorithm of the steps to make tempeh chocolate is in the form of pictures and statements because there are students who can only read pictures while those who can read letters, pictures to strengthen understanding. The design of the algorithm for the steps to make tempeh chocolate is

Figure 2: Design algorithm of steps to make tempeh chocolate

The observation stage is an effort to observe the activities and behavior of mildly deaf children during classroom learning. Observations were made during the vocational learning process of making chocolate tempeh by using the observation sheet that had been made. The process of action, the effect of action, the situation of the place of action, and the constraints of action are all recorded in a planned and flexible field note sheet. The last stage is reflection. Reflection is a very important activity to find out the shortcomings and strengths that occur during learning. Reflection is carried out by researchers together with collaborators by conducting joint discussions. Reflection activities will solidify the planning and actions to be taken in cycle II. Cycle II was carried out starting with planning, action, observation and reflection by taking into account input from collaborators.

The data analysis technique used in this research is descriptive qualitative quantitative. The results of the data in the form of numbers are then used for the inductive process. The inductive process in question is a thinking process based on data with analysis through tables then narrated in general. Quantitative data is obtained through the results of calculations in observation guidelines and student performance tests. The quantitative data calculations are presented in tabular form and supplemented by interview data. Both data are presented simultaneously in narrative form. The success criteria for vocational learning class action research on making tempeh chocolate is marked by the acquisition of a score of 75 learning objectives completeness criteria, which is characterized by the acquisition of good quality tempeh chocolate making results, namely the presence of flavor stability, tempeh maturity (not burnt), mixing tempeh chocolate evenly and neatness in packaging. If students are able to make tempeh chocolate with good quality (taste, maturity and neatness in packaging) then this research is said to be successful.

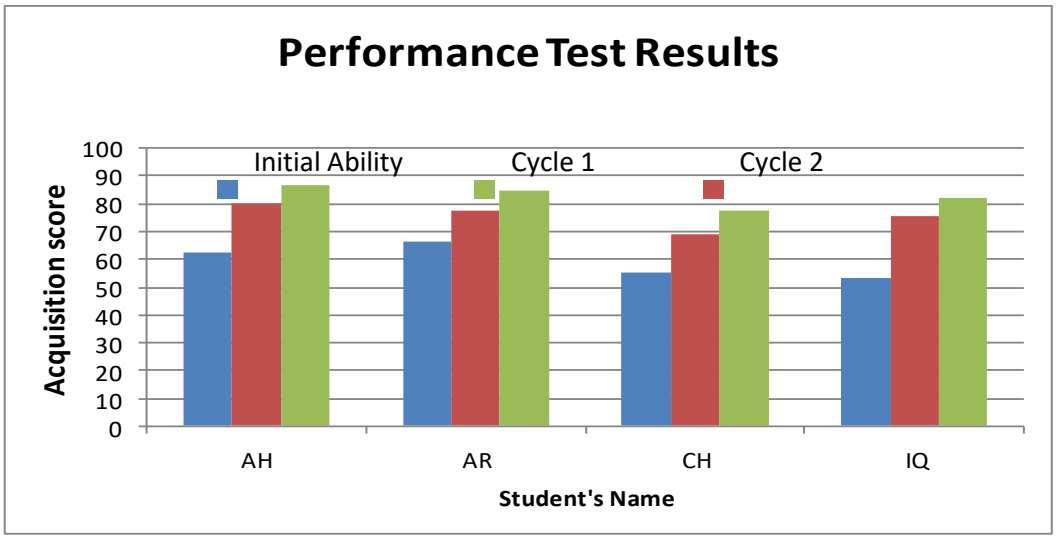
## *Discussion and Results*

The data description of the research results of cycle 1 and cycle II can be described through the following table.

Table 1. Recapitulation of Vocational Assessment Results of Making Tempeh Chocolate for Mild Tunagrahita Children

| No | Student | Results Initial ability | Cycle I | Cycle II | Improved | |
|---|---|---|---|---|---|---|
| | | | | | Cycle 1 | Cycle II |
| 1. | AH | 62,22 | 80,00 | 86,66 | 17,78 | 24,44 |
| 2. | AR | 66,66 | 77,77 | 84,44 | 11,11 | 17,78 |
| 3. | CH | 55,55 | 68,88 | 77,77 | 13,33 | 22,22 |
| 4. | IQ | 53,33 | 75,55 | 82,22 | 22,22 | 28,89 |
| | Rata-rata | 59,44 | 75,55 | 82,77 | 16,11 | 23,33 |

From the table it can be described that cycle I scored AH 80.00, AR 77.77, CH 68.88, IQ 75.55 while cycle II scored AH 86.66, AR 84.44, CH 77.77, IQ 82.22. The increase obtained in cycle I AH 17.78, AR 11.11, CH 13.33, IQ 16.11 while the increase obtained in cycle II AH 24.44, AR 17.78, CH 22.22 and IQ 28.89. The overall average obtained in cycle I was 75.55 and cycle II was 82.77, while the overall average increase was cycle I 16.11 and cycle II 23.33. The increase in success using the computational thinking approach more clearly can be seen in the graph below




The results obtained in cycle II shown in the graph show an increase in the scores of all children with mild Tunagrahita. This increase occurred in each child with a different range of values. The increase obtained in cycle I there was one child who had not met the KKTP 75 so that the action was continued in cycle II. After the second cycle of action was completed, the test results showed that all mildly disabled children met the KKTP score of 75. To strengthen the results of the performance test, the researcher conducted observations. The observation results can be described as follows.

Table 2. Recapitulation of Observation Results of Cycle I and Cycle II Vocational Learning to Make Tempe Chocolate

| Subject | Observation Result | |
|---|---|---|
| | Siklus I | Siklus II |
| AH | • able to prepare tools and ingredients, able to melt the chocolate, able to determine the level of doneness<br>• Difficulty pouring the tempeh chocolate in the cupcase, as well as difficulty in the packaging process of clasping the bottom and top using steples. | • Able to prepare tools and materials, fry tempeh and determine the level of doneness, able to slice chocolate and melt chocolate, able to package chocolate neatly using chocolate mica.<br>• Difficulty in mixing chocolate with tempeh until smooth and determining the level of dryness of tempeh. |
| AR | • Able to prepare tools and materials independently, able to determine the level of chocolate dilution.<br>• Difficulty determining the level of maturity of tempeh, the process of melting chocolate, the process of packaging tempeh chocolate is not neat and in pouring tempeh chocolate into a cupcase smudged. | • Able to prepare tools and ingredients, fry tempeh and determine the level of doneness, able to slice chocolate and melt chocolate, able to package chocolate neatly using chocolate mica.<br>• Difficulty in mixing chocolate with tempeh until smooth and pouring tempeh chocolate into cupcases. |
| CH | • Able to prepare tools and materials independently<br>• Difficulty in determining the level of maturity of tempeh, determining the dilution of chocolate and the packaging | • Able to prepare tools and materials, fry tempeh, able to slice chocolate and melt chocolate, able to package chocolate neatly using chocolate mica independently<br>• Difficulty in determining the level of |

| | | |
|---|---|---|
| | process in sealing the bottom and top using steples. | maturity of tempeh and mixing chocolate with tempeh until smooth |
| IQ | • Able to prepare tools and materials independently<br>• Difficulty in determining the level of maturity of tempeh, determining the dilution of chocolate and the packaging process, namely difficulty in closing the bottom and top using steples. | • Able to prepare tools and materials, fry tempeh and determine the level of doneness, able to slice chocolate and melt chocolate, able to package chocolate neatly using chocolate mica.<br>• Difficulty determining the level of chocolate dilution and mixing the chocolate with tempeh until it is evenly distributed. |

From the research data, the data obtained from the performance test reinforced by the results of observations showed that cycle 1 there were mildly disabled children who had not been able to reach the specified value standards then continued with cycle II. The results of this study as a whole show an increase in vocational skills in making tempeh chocolate using a computational thinking approach. The success criteria for cycle II action have been met so that the action is ended until cycle II only not continued to cycle III.

## *Discussion*

Mildly retarded children are those who have the ability to develop in the areas of academic learning, social adjustment and employability (Amin, 1995). The development of employability learning is applied to vocational learning in schools. Vocational learning for mildly retarded children requires a learning climate that supports the implementation of learning so that learning objectives are easily achieved. In order to create this learning condition, teachers must be able to organize students, resources, and a pleasant learning environment (Yatim Riyanto, 2010: 19). Furthermore, Hamalik (2001) states that effective learning is learning that provides opportunities for self-learning or doing the widest possible activities for students to learn. Vocational learning must be able to provide opportunities for mildly disabled children to explore their competencies by using a computational thinking approach. As the opinion of Yasin (2020) states computational thinking as a skill that allows learning to think logically and will be able to solve complex and open problems.

Based on the results of the actions of cycles I and II, it is evident that the computational thinking approach is able to improve vocational learning in making chocolate tempeh for mildly deaf children. One indicator of the success and quality of learning for children with mild disabilities is determined by understanding the concept of vocational learning material. The computational thinking approach can make a bridge for mildly disabled children to understand the concept of vocational learning material. This is in line with the opinion conveyed by Csizmadia et al (2015) that the computational thinking approach is a student cognitive process which involves logical reasoning in compiling and solving a problem with steps and systems that are easy to understand.

This computational thinking approach is part of the learning strategy carried out by the teacher as an effort to achieve learning objectives. Learning strategies are prepared to achieve learning objectives, which means that the preparation of learning steps, methods, approaches, utilization of learning resources are all directed at achieving learning objectives. Furthermore, Chahyadi, et al (2021) computational thinking is one of the strategies in improving students' higher-level thinking skills. The computational thinking approach is a learning approach that stimulates students to explore themselves, explore all the potential possessed by mildly disabled children to stimulate mildly disabled children to think at a high level in accordance with their competencies. The basic concepts in the development of computational thinking are decomposition, pattern recognition, abstraction and algorithmic thinking (Barr, 2022: 3). The implementation of the concept of the computational thinking approach for mildly disabled children is (1)

decomposition, at this stage mildly disabled children discuss to break down complex problems, namely the process of making tempeh chocolate into details with the guidance of the teacher, (2) the pattern recognition stage, mildly disabled children together with the teacher look for patterns of problem solving by looking for advantages and disadvantages of each detail of the problem, the process of making tempeh chocolate, (3) the abstraction stage, children with mild disabilities together with the teacher generalize the problem by drawing general conclusions about solving problems that are visualized by the practice of making tempeh chocolate, along with visualizing images of materials, tools and steps for making tempeh chocolate, (4) the algorithm stage, this stage students together with the teacher compile stages that contain steps that are sequenced in a complete and measurable manner, in addition to assembling the stages of making tempeh chocolate to confirm the steps of making tempeh chocolate through the practice of making tempeh chocolate using the stages that have been arranged.

The improvement of vocational skills using the computational thinking learning approach can be seen from the learning outcomes of each cycle. The increase in the average learning outcomes of the performance test for cycle I was 16.11 and the increase in the average value of learning outcomes for cycle II was 23.33. This proves that the computational thinking learning approach is able to improve the ability of vocational skills. Computational thinking can encourage students to think systematically and make it easier for children with disabilities to understand complex problems that are broken down into more detail so that they are easily understood by mild disabilities in solving problems. Computational thinking will provide direct experience to children with disabilities in developing vocational skills. This is in line with Runtukahu's (2014:105) opinion that concept understanding must be developed from real experiences and through this way students can manipulate concrete objects with their own language. The benefits of computational thinking include (1) making it easier for mildly disabled children to break down complex problems into smaller sub-subs, this makes it effective and efficient (2) training mildly disabled children to start thinking creatively and structurally (3) Making it easier for mildly disabled children to determine the solution to existing problems.

The results of this study are able to strengthen some of the results of previous studies that prove that computational thinking can improve student learning abilities. The results of Syamsi & Sholikhah's research (2023) with the subjects of classes VII and VIII that the computational thinking approach, learning math becomes more fun and interesting, students' creativity in solving math problems increases so that students' ability to solve problems has increased. This shows that the computational thinking approach can increase students' creativity and ability to solve problems. Furthermore, the use of computational thinking learning strategies can increase the value of cognitive learning outcomes and have higher learning completeness in Indonesian language subjects for grade III elementary school students (Afnyya & Aprinastuti, 2023: 44).

## *Conclusion and Suggestions*

Based on the discussion that has been carried out, it can be concluded that the application of the computational thinking learning approach can improve the ability of vocational skills in making tempe chocolate as indicated by the results of the study. Learning vocational skills of making tempe chocolate for Tunagrahita class VII by using this computational thinking learning model can make it easier for teachers to assist and guide students to understand the learning of making tempe chocolate. The use of this computational thinking learning model can improve the vocational skills of making tempe chocolate for Tunagrahita students. This can be proven by an increase in the average ability of 7.22 while after cycle II the average ability increase was 23.33. All students can achieve results above the KKTP which is 75. Overall, it can be said that learning vocational skills of tempeh chocolate using the computational thinking learning model for mildly disabled children was successful both in cycle 1 and in cycle II, all students were able to make their own from the initial process of preparing materials and tools, the manufacturing process to the packaging process.

***References***

Amin, mohammad. (1995). *Ortopedagogik Anak Tunagrahita*. Bandung: Depdik.

Arikunto, S. Suharjono, & Supardi. (2007). *Penelitian Tindakan Kelas*. Jakarta: Bumi Aksara.

Azizah, N., Baptista, Y., & Aprinastuti, C. (2023). *Penerapan Pembelajaran IPA berbasis Computational Thinking Materi Siklus Air Kelas V Sekolah Dasar*. Prima Magistra: Jurnal Ilmiah Kependidikan, 4(3), 269-282. https://doi.org/10.37478/jpm.v4i3.2655.

Barr, Valerie. (2022). *"Computational Thinking." Computing Handbook: Two-Volume Set*: 1-12.

Csizmadia et al. *Computational Thinking: A Guide for Teacher*s, Comput.Sch. no. October (2018. 2015).

Hamalik, Oemar. (2001). *Psikologi Belajar dan Mengajar*. Bandung : Sinar Baru Algensindo.

Jeannet (2023) http://bebras.iainsalatiga.ac.id/web/computational-thinking/#:~:text=Pada%20tahun%202011%2C%20Jeannette%20memperkenalkan,yang%20.

Yatim Riyanto. (2010). *Paradigma Baru Pembelajaran : Sebagai Referensi bagi Pendidik Dalam Implementasi Pembelajaran yang Efektif dan Berkualitas*. Jakarta : Prenada Media.

**Web**

https://www.gramedia.com/literasi/berpikir-komputasional/ .

http://www.wearemania.net/tempe-homemade-apa-resepnya/604.

http://www.hipwee.com.coklat-tempe-untuk-bingkisan-lebaran/.

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