JPPIPA 9(9) (2023)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Achieving Gold in Cambridge Lower Secondary Science Test

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Received: March 10, 2023
Revised: August 22, 2023
Accepted: September 25, 2023
Published: September 30, 2023

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DOI: 10.29303/jppipa.v9i9.3393

Abstract: This study investigates students' performance in the Cambridge Lower Secondary Test, especially in science subjects, after implementing the AIR (Auditory, Intellectually, and Repetition) learning model. The research subjects are ICP (International Class Program), totaling 16 students at SMP IT Albiruni Mandiri Makassar. The implementation of the AIR model is carried out since students are in stage 8 and continue to stage 9. The type of test for stages 7 and 8 is the Cambridge Lower Secondary Progression Test. The stage 9 test type is the Cambridge Lower Secondary Checkpoint. The test results are described in the form of grades, namely Bronze, Silver, and Gold. At stage 7, the percentage of students who received Bronze was 68.75%, Silver 31.25%, and Gold 0.00%. There was a significant increase in stage 8, with 37.50% who got Bronze, 18.75% got Silver, and 43.75% got Gold. Then at stage 9, there was an increase of 68.75% of students who got Gold, 12.50% got Silver, and 18.75% got Bronze.

Keywords: AIR (Auditory, Intellectually, Repetition); Cambridge lower secondary test; Science

Introduction

One of the adaptive curricula used in Indonesia is the Cambridge curriculum. This curriculum was introduced by Cambridge Assessment International Education which provides a curriculum with internationally recognized qualifications that are globally recognized. Cambridge programs and qualifications set the global standard for international education. Based on current educational rigor and assessment, programs and qualifications created by subject matter experts. This curriculum develops students' understanding and skills in three aspects: English, mathematics, and science (Cambridge Assessment International Education, 2022). Through this curriculum, students are not expected to succeed in learning but only love the learning process, can think critically, and have social intelligence (Lim, 2011, 2012).

Many schools in Indonesia have implemented the Cambridge curriculum integrated with the applicable national curriculum. Integration of the 2013 curriculum and the Cambridge curriculum can improve a) English language skills; b) ability to reason, c) the ability to think creatively; and d) academic achievement (Hasanah, 2019). Implementing the Cambridge curriculum in South Sumatra is quite good because schools continue to map the national and Cambridge curricula. The additional class will be made for materials that are not the same (Marleni; Jaya, 2022). Therefore, the expected implication of this curriculum is that it can help schools worldwide improve the quality of learning, both in the pre-pandemic period and during the Covid-19 pandemic (Simanjuntak et al., 2022).

This curriculum consists of several stages at the education level, starting from kindergarten to high school. The four stages are Cambridge Primary (5–11 years), Cambridge Lower Secondary (11–14 years), Cambridge Upper Secondary (14–16 years), and Cambridge Advanced (16–19 years) (Cambridge Assessment International Education, 2022). At the end of the junior secondary level learning (Lower Secondary), each level will be given an exam consisting of the Lower Secondary Program and Lower Secondary Checkpoint. Cambridge Lower Secondary Progression for stages 7 and 8, while Lower Secondary Checkpoint for stage 9. The test is presented in English. The purpose of the

How to Cite:
Munawwarah, M., & Alqadri, Z. (2023). Achieving Gold in Cambridge Lower Secondary Science Test. *Jurnal Penelitian Pendidikan IPA*, *9*(9), 6932–6936. https://doi.org/10.29303/jppipa.v9i9.3393

Cambridge Checkpoint test is to provide feedback to students regarding their strengths and weaknesses before continuing to the next level of Education (SMA) (Interes-team, 2021).

The Cambridge checkpoint questions have different characteristics from the types of questions for the junior high school level, which provide multiple-choice test questions. At the Cambridge checkpoint, all questions are filled in and done relatively quickly. Through description questions, students can channel creativity, think critically, and provide evidence for the answers they put forward (Cambridge Assessment International Education, 2022). Therefore, teachers and students need good preparation for the exam. One effort can be made to use a suitable learning model, the AIR (Auditory Intellectually Repetition) learning model. This learning model is a student-centered learning model that prioritizes student activity, especially in terms of listening, speaking, explaining ideas orally (Auditory), training students' ability to solve problems (Intellectually), and strengthening student understanding through repetition activities (Repetition) (Amin et al., 2022).

Auditory is the stage of learning by speaking. At this stage, information is obtained using the sense of hearing through speaking, listening, presenting, listening, responding, and expressing opinions. Listening activities in the learning process can help increase student learning activities and motivation either directly or in the form of learning media (Sanjaya et al., 2021). This step is usually carried out in the learning process in groups so that there is interaction and exchange of information for each student. Intellectually is a learning step that relies on the mind's ability to process information received by students by reasoning, investigating, finding, identifying, and solving a problem. Repetition is the step of repetition, deepening, and strengthening students in understanding a material by asking questions or in the form of modified information (Jannah et al., 2019).

Several previous studies have shown the results of the application of the AIR learning model. AIR can improve teacher activity, student activity, and student chemistry learning outcomes (Sumiati et al., 2019). Learning using this model has a positive effect on students even though students have low mathematical abilities (Ain & Kamaluddin, 2020). In addition, students who study using this model have a significant problem-solving skill level than those who use conventional learning (teacher center) (Kamsurya & Saputri, 2020). Apart from that, the use of this model can be done with students' different reading skills so that it has an even positive impact (Fitri & Gani, 2020). This model can also be implemented together with interactive multimedia learning using articulate storylines so that learning outcomes can be further improved (Alqadri et al., 2021; Munir et al., 2018). Interactive multimedia can also be developed according to Auditory Learning, Intellectually, and Repetition Learning models. In this case, the most important part is providing opportunities for students to repeat parts that have not been understood (Munir et al., 2018).

Based on the description presented, A learning model is needed that can help students understand learning in depth according to the level of development of students' cognitive abilities. Therefore, the researcher found that no previous research used the AIR model in learning in the Cambridge curriculum. Therefore, the purpose of this study was to determine the results of the implementation of the AIR learning model in preparation for the *Lower Secondary Progression Test* and *Cambridge Lower Secondary Checkpoint* for ICP (International Class Program) students at SMP IT Al-Biruni Makassar.

Method

The Auditory Intellectually Repetition (AIR) learning model is applied to the ICP (International Class Program) students of SMPIT Al-Biruni. The study was conducted for two years, from 2020 to 2021. The learning model was implemented since students were in stage 8 and continued to stage 9. The AIR model focuses on dealing with the Cambridge Lower Secondary Progression Test for stage 8 and Cambridge Lower Secondary Checkpoint for stage 9 in science subjects. The following Figure 1 shows the flow of this research.

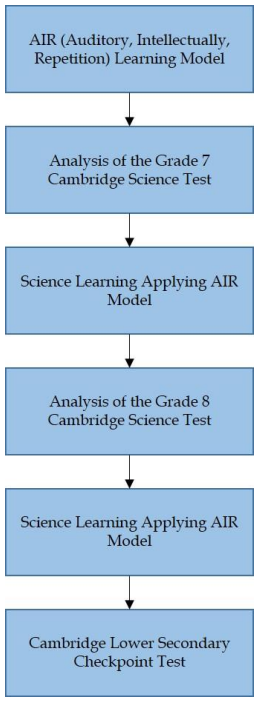

Figure 1. The flow of the research

The research subjects were ICP (International Class Program), entered in 2018 by as many as 16 students. The research was conducted at SMP IT Albiruni Mandiri Makassar in 2020–2021. The Cambridge Lower Secondary Test questions from 2014 to 2020 are a reference in studying solving strategies and introducing question characteristics. The steps in the AIR Model Learning (Amin et al., 2022), which are applied to the Cambridge checkpoint preparation, are:

1. *Auditory*
   a) The teacher divides the students into several small groups
   b) The teacher distributes Cambridge checkpoint questions several years earlier to be discussed in groups
   c) The teacher allows asking questions to students who still do not understand
   d) Each student in the group is required to interact with each other in solving the questions given.
2. *Intellectually*
   a) The teacher guides the student study group by providing a general explanation regarding the questions discussed in the group
   b) Students are asked to present the discussion results with their group friends in front of the class.
   c) The teacher assesses the student's ability to provide solutions to the questions given.
   d) Students respond to the results of other group discussions
3. *Repetition*
   a) The teacher gives individual exercises to each student
   b) The teacher distributes similar questions to students to be done individually at home and checked at the next meeting

The instrument used to measure student achievement using the AIR model is the Cambridge Lower Secondary Progression Test 2020 and Cambridge Lower Secondary Checkpoint 2021.

Table 1. Percentage Ranges for Grades Percentage

Science	Bronze	Silver	Gold
	% of total marks	% of total marks	% of total marks
Stage 7	0–55	56–78	79–100
Stage 8	0–60	61–83	84–100
Stage 9	0–54	55–84	85–100

Resource: (Cambridge Assessment International Education, 2021)

Result and Discussion

The AIR model was implemented in the International Class Program (ICP), entered in 2018. The AIR model application is used in preparation for the Cambridge Lower Secondary Test, especially in science subjects. Researchers implemented this model on students from stage 8 and continued at stage 9. Implementation in stage 8 to prepare students for the Cambridge Lower Secondary Progression Test. Then the researcher continued to use the model in stage 9 to face the test and the Cambridge Lower Secondary Checkpoint. The teacher has not used this learning model in stage 7 because the teacher is still studying the characteristics of each student in the learning process. The learning model used when students are in stage 7 is a conventional learning model (teacher center). However, the conventional learning model showed low results on the Cambridge Lower Secondary Progression Test. This is because students are not used to solving problems from the Cambridge curriculum. In addition, students have not been given many opportunities to repeat questions like that.

The implementation of the AIR model is described as follows for faced with these two types of tests. The first step of the AIR model is Auditory. This step begins by dividing students into four heterogeneous groups, such as cooperative learning models in general. Students are invited to actively discuss with their group friends and the teacher at this stage. Students are allowed to express opinions, ask questions, and answer questions related to the problems given by the teacher. The essence of this step is that students learn by speaking and using their sense of hearing. Information is received and conveyed by voice. The problems that the group of students must solve are in the form of Cambridge Lower Secondary Test questions. The questions used as practice material at stage 8 are questions from 2014 to 2019. As for stage 9 questions used as exercises, questions from 2014 to 2020.

Figure 2. Students activity in groups

The discussion activities in their respective groups can be seen in figure 2. At the Auditory step, students communicate verbally with both group friends and teachers. The teacher allows each student to ask questions about problems that cannot be solved in the small group discussion. The second step is intellectually. At this step, the teacher explains the material being studied. The teacher then allows each group to present the results of their group discussion to other groups. The other groups then gave their responses regarding the presentations from other groups. At this step, the teacher assesses the student's ability to solve the problems that have been given. The third step of this model is repetition. This step is the main characteristic of the AIR learning model. Students are given individual assignments as part of the Cambridge Lower Secondary Test questions. This step aims to deepen, expand, and stabilize each student's mastery of the material (Fitria & Widi, 2015; Krisno, 2016; Winarti & Suharto, 2017). This causes an increase in the effort obtained by each student in Figure 3.

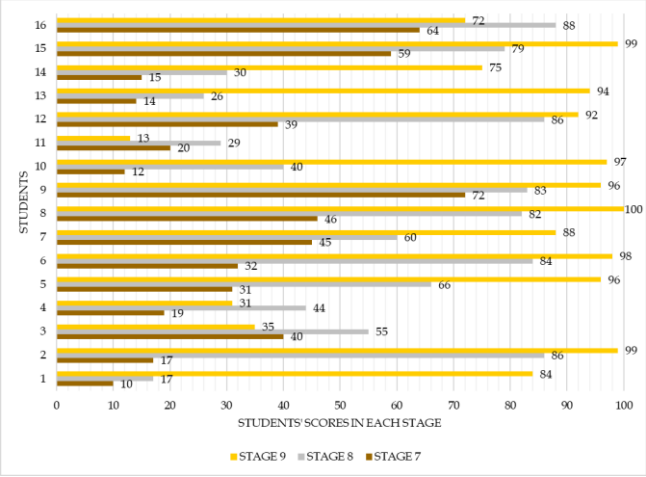

Figure 3. The students' results of science secondary progression test in stage 7-9

There are five sub-materials in science that are taught in the Cambridge curriculum at the junior high school level: Physics, Chemistry, Biology, and Science In. Students get test results in the form of a total percentage of all sub-materials that are accumulated as the achievement of science scores. These achievements are presented in the form of Percentage Stages according to the criteria in table 1. The achievements of each student from stage 7 to stage 9 can be seen in figure 3. Based on figure 3, we can see that all students experienced a significant increase in learning outcomes in stage 8. The significant increase shows an effect after the learning model is changed from the conventional learning model to the AIR learning model from stage 7 to stage 8. Achievement of test results there was a very significant increase in stage 9. The achievement shows that after implementing the AIR model for two years, the individual students continued to experience improvement. Especially in chemistry material, using this model can be a step so that students are able to understand the representative level of chemistry (macroscopic, submicroscopic and symbolic aspects of chemical knowledge) (Taber, 2013).

Grades at each stage have a different range (see table 1). We can see that the higher the stage, the lower the range is higher. This shows that the tests given to students from the lowest stage can be a reference point so that students can continue to improve their achievements. In addition, the types of tests given to students at each stage are also different. At stages 7 and 8, the type of test is the Cambridge Lower Secondary Progression Test. This test shows students' ability and student improvement at the end of learning. Through this test, the teacher can improve learning strategies if there are problems in students' achievement and learning process. As for stage 9, the type of test is Cambridge Lower Secondary Checkpoint. This test serves as a reference for students to be able to continue to the next level of education (high school).

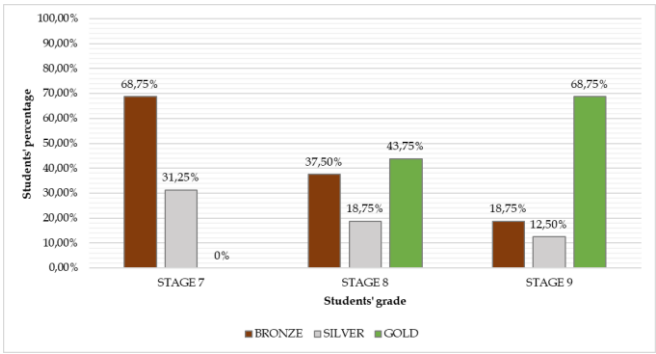

Figure 4. The students' grades of science secondary progression test in stage 7-9

Figure 4 shows student achievement from stage 7 to stage 9. The achievement in the figure 4 is a percentage of the average grade obtained by students. Based on the graph, we can see that there are achievements of Bronze, Silver, and Gold grades at each stage. At stage 7, the percentage of Bronze grades is the highest achievement, exceeding half of the number of students in the class. Then at the same stage, the grade obtained is 31.25% Silver. At this stage, none of the students got the Golden grade. These results tell us that at stage 7, students' achievement is still meager on the Cambridge Lower Secondary Progression Test, especially the science subject. At stage 7, students do not understand the material, the form of the test, and the strategy for completing the test. At this stage, the teacher uses a conventional learning model (direct learning with the

lecture method). This is in line with the results of (Adiani & Rini Kristiantari, 2020; Hobri et al., 2021) research which states that the AIR learning model is able to improve students' creative thinking abilities and positive impact on students.

Low achievement at stage 7 becomes the basis for teachers to evaluate students' learning process, especially on the subject of science. After implementing the AIR model at stage 8, student achievement results increased, indicated by the presence of 43.75% of students who obtained Gold grades. The implementation of AIR had a significant impact in the first year. Therefore, it was continued at stage 9, and the student achievement was very significant, as indicated by the average Gold grade of 68.75%. This shows that the longer AIR is implemented, the repetition of similar exercises will be more frequent, so students' understanding will be deeper. This follows research conducted by (Sarniah et al., 2019; Syazali et al., 2021) that students' understanding of mathematical concepts using the AIR model is better than the direct learning model.

Conclusion

Implementing the AIR (Auditory, Intellectually, and Repetition) model to ICP (International Class Program) students batch 2018 led to an increase in test results from one stage to the next. All students individually experienced a significant increase in their achievement from stage 7 to stage 8. The increase in test results from stage 8 to stage 9 was very significant. Based on the average achievement of all students at each stage, 7 has a Bronze grade of 68.75%, Silver 31.25%, and 0.00% Gold. At stage 8, there is an increase in grades, namely Bronze 37.05%, 18.75% Silver, and 43.75% Gold. At stage 9, the increase in Gold grade achievement is very significant, namely 68.75%. Bronze and Silver grades are getting less in grade 9, namely 18.75% and 12.50%. The most crucial stage in the AIR model is the repetition stage by providing practice working on Cambridge questions from 2014–2020.

Authors Contribution

Munawwarah compiled the content of the article, analyzed the data, and looked for related references. Zulqifli Alqadri presented the data, checked grammar, and looked for related references.

Funding

This research is carried out independently without funding from any institution.

Conflicts of Interests

The authors declare that there are no conflicts of interest.

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