

# **CHAPTER III**

## **RESEARCH METHOD**

In this chapter, the researcher describes the method that is used to conduct the study. The researcher describes research design, subject of study, data collection, procedure and data analysis

### **3.1 Research Design**

The research approach is carried out with a case study approach that focuses on a student with an ASD background having an IQ of approximately 90, students who study in public schools but still get therapy related to mental retardation they experience. The researcher used Case study as a research design that fits the research. This is because the case study is believed to be able to reveal a study which is based on the survey and is historically suitable for descriptive phrases (Shavelson & Townes 2002). A case study is also Empirical Inquiry which investigates the current phenomenon based on real life content, especially within the limits clear (Yin, 2003). Case studies allow for in-depth analysis of participants in naturalistic settings that allow detailed reflection of the phenomena that occur (Kervin, Vialle, Howard, Herrington, & Okely, 2016) The most effective and hard case studies when 'utilizing various sources of collection data '(Kervin, Vialle, Howard, Herrington, & Okely, 2016). In this study naturalistic observations, interviews and artifacts were examined to evaluate participants' involvement and motivation during the research process (Kervin, Vialle, Howard, Herrington, & Okely, 2016).

### **3.2 Subject**

The subjects of this study are two students with ASD background. The first students named Yavi. An Twelve grade students, aged 19 years old with IQ 108. He experiences inclusive education since elementary until junior high school levels, and he moved to general high school education program. He has participated in the therapy since three years old. He had been achieved many Math Olimpiade. He is good at arithmetic. The second subject is a Twelve grade student from Vocational high school. He is 19 years old. He had 72 IQ. He has participated in the therapy since two years old. He experience inclusive school education since elementary school until Junior high school then He continued to Vocational high school. In order to select the subject researcher used Psychology Laboratorium and PPABK (Paguyuban Pemerhati Anak Berkebutuhan Khusus) are the unit in the University of Muhammadiyah Gresik. The researcher tried to find the subject based on the certain criterion based on the Fauziyah 2019.

### **3.3 Instrument**

Main instrument in here is researcher's observation and the support instrument is text of reading problem and transcript of interview. The researcher acted as a planner, collector, analyzer, interpreter and reporter of the research results. Thus the researchers have to be objective, responsive and neutral. The material is using PISA Reading literacy as the support instrument and method Task Based Interview with Think-aloud Method.

### **3.3.1 PISA Reading Literacy**

The researcher using 3 question from PISA Reading literacy 2015. The topic in the question is about bird migration. There are two text and three question. The first text is talking about how the migration of bird and the second text talked about the route of birds migration. The researcher used three question because its is enough to know reading cognition process in the autism.(Slayton & Nelson, 2017; Sri Imelda Edo, Yusuf Hartono, 2013); OECD (2013)

## **3.4 Data Collection**

### **3.4.1 Observation**

Observation is the part of Qualitative research and so does A Case study. Observation is a qualitatif method which not only include participant observation but also about ethnography and how participant work in the field study. This method data can be integrated as auxiliary or confirmatory research (Knowledge, 2014). The analysis of observation using descriptive. The aim of the observation is to analyse the process of students solve problem of PISA Reading Literacy based on the PISA Reading Literacy. The analysis based on the answer of students. Aspect that analyse are students's understanding, paraphrasing, student's planning, Students's Prediction, Student's strategies, student's visualization and checking over the data based on the interview.

### **3.4.2 Task Based Interview with Think-aloud Method**

Data collection on the subject of the study was carried out sequentially, one by one. Data collection was conducted by using task-based interviews with think-aloud method. Taskbased interview is an interview which suitable with the

aims of this study. Task-based interviews provide opportunities to assess student conceptual knowledge, but they may also provide opportunities to extend that understanding. In a task-based interview, the student being interviewed interacts with the interviewer within a task environment. A key component in providing this environment is a carefully chosen task (Maher & Sigley, 2014)

Think-aloud Method is the research strategy which participants need to speak aloud any words based on their mind. The task of learning to think hard must be carefully chosen, maintaining cognitive participant's ability in mind. Ericsson and Simon (1980) found that tasks that make students lazy create a high "high cognitive load", because processing information is too crowded in working memory. It also has an impact on simple tasks it may also be inappropriate as a "closer reader" activity becomes automatic, increasingly problematic for the reader explain this automatic or almost automatic event "(Pressley & Afflerbach, 1995, p. 132). In here, the researcher use Open question interviews. It take a time after student answer the question and flexible not only based on the previous instrument that the researcher get from the Previous researcher.

The subject of this study worked on the PISA Literacy problem by writing the answer on the answer sheet provided and revealing what he was thinking at that time with a loud voice. If the subject does not reveal the thought process, the researchers will ask open questions to get a response. All subject activities at solving reading problems were recorded with a video recorder. The think-aloud method can be applied effectively to obtain qualitative research data.

### **3.6 Data on Analysis**

In this study, participants had to speak aloud every word they thought when they finished the task. Research methods Think-aloud has a strong theoretical basis with valid data sources about what is in the mind of participants during language-based activities (Charters, 2003); (Fuzyiah, Lant, Budayasa, & Juniati, 2019) Analysis of data using subject answer sheets, transcripts of video recordings and interpretation of subject behavior when they solve problems. Data is categorized into four categories, understanding problems, arranging plans, implementing plans, and looking at data again (Fauziyah N., Lant, Budayasa, & Juniati, 2019)

#### **3.6.1 Observation**

The analysis of observation using descriptive. The aim of the observation is to analyse the process of students solve problem of PISA Reading Literacy based on the PISA Reading Literacy. The analysis based on the answer of students. Aspect that analyse are students's understanding, paraphrasing, student's planning, Students's Prediction, Student's strategies, student's visualization and checking over the data based on the answer of interview and the mimic of students. The reseracher using field note to observe the student and also record the student. based on the video the researcher will take the data that reseracher need to analyse the students. The researcher will use video recoded to analyse the student behavior and response how the cognition process of student prediction, Planing, Visualization and students strategis.

### 3.6.2 Interview

The aims of interview is to understand the cognition process on the students while they are solving the problem adopted from (Fauziyah et al., 2019) and used unstructured question. The first question is **“Do You Understand the problem?”** this question is to analyse the understanding of students about the problem that happens in the question. The answer of the question can then based on the answers to the questions the researchers were able to analyze whether their understanding was the same as the goal of PISA reading Literacy.

The second question is **“which information is the most important to solve the problem?”** and **“Do you find any other crucial information from the problem? Is the information from the problem enough to solve the problem?”** **“this** question is to analyse how students demonstration to solve the problem. The answer from the question can make the researcher understand plan and the stage of students for solve the problem.

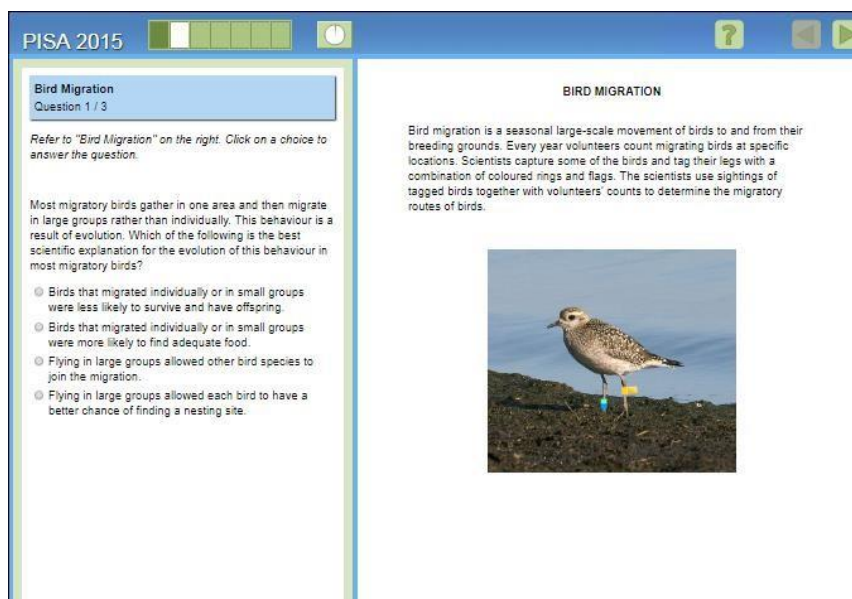
Third question is **“Can you retell the problem with your own language?”** this question is to analyse how students cognition in paraphrasing and students way to deliver the understanding in text and the question’s problem.

### 3.6.3 PISA Reading Literacy

Researchers using PISA reading Literacy 2015 have 2 text. the First text Is about Bird migration, It is tell about How the migration of bird conducted every years. The second text is about the map of bird which migration Inter-country and

the direction of bird migration in spring and autumn season. This question chosen because the question is suitable with student with autism spectrum disorder level.

There are three questions and each question has a different level of cognition. PISA is designed to measure cognitive of student around the world in study of reading literacy, Reading mathematics and reading science (Khamkhong, 2018) the researcher used three questions because it is able to measure the cognitive process on the students. The question in multiple choice and in writing conclusion. On the first question. With the title Bird migration. Having multiple choice type questions, have a competence standard Explain Phenomena Scientifically.



The screenshot shows a PISA 2015 question interface. The title is "Bird Migration" and it is labeled as "Question 1 / 3". The instruction says: "Refer to 'Bird Migration' on the right. Click on a choice to answer the question." The question text is: "Most migratory birds gather in one area and then migrate in large groups rather than individually. This behaviour is a result of evolution. Which of the following is the best scientific explanation for the evolution of this behaviour in most migratory birds?" There are four multiple-choice options:

- Birds that migrated individually or in small groups were less likely to survive and have offspring.
- Birds that migrated individually or in small groups were more likely to find adequate food.
- Flying in large groups allowed other bird species to join the migration.
- Flying in large groups allowed each bird to have a better chance of finding a nesting site.

On the right side of the interface, there is a section titled "BIRD MIGRATION" with a text block: "Bird migration is a seasonal large-scale movement of birds to and from their breeding grounds. Every year volunteers count migrating birds at specific locations. Scientists capture some of the birds and tag their legs with a combination of coloured rings and flags. The scientists use sightings of tagged birds together with volunteers' counts to determine the migratory routes of birds." Below this text is a photograph of a bird standing on a rocky or grassy ground, with a blue ring and a yellow flag on its leg.

In question 1, students are asked to choose an **explanation** for the phenomenon that is determined that birds migrate in large groups. This question, which is at the bottom end of **Level 3**. The goal of this question is **to recognize the relationship between, several pieces of information in order to identify a**

**main idea and to identify the right conclusions about the evolutionary benefits of this behavior.**

The screenshot shows a PISA 2015 assessment interface. On the left, a blue header reads 'PISA 2015'. Below it, a box contains the question title 'Bird Migration' and 'Question 2 / 3'. The question text asks the student to identify a factor that might make volunteers' counts of migrating birds inaccurate and explain how that factor will affect the count. A large empty text box is provided for the answer. On the right, the text 'BIRD MIGRATION' is followed by a paragraph explaining that bird migration is a seasonal large-scale movement and that volunteers count birds at specific locations. It mentions that scientists capture birds and tag them with colored rings and flags. Below the text is a photograph of a bird, likely a gull, standing on a dark, rocky or grassy ground. The bird has a yellow tag on its leg.

The second question has a **Human Code** question type which has the **Evaluate competence and scientific inquiry design**. in this text students must use procedural knowledge to identify factors that can cause inaccurate numbers of migratory birds and explain how they can affect the data collected. Being able **to identify and explain potential limitations** in the data set is an important aspect of scientific literacy. for *full* credit the student identifies at least one specific factor that can affect the accuracy of counts by observers for example: The observers may miss counting some birds because they fly high, If the same birds are counted more than once, that can make the numbers too high, For birds in a large group, volunteers can only estimate how many birds there.

To correctly answer this question, students must use procedural knowledge to identify a factor that might lead to inaccurate counts of migrating birds and



explain how that could affect the data collected. Being able to identify and explain potential limitations in data sets is an important aspect of scientific literacy and locates this question at the top of Level 4.

Next the students are asked more questions with the same text Question 3 requires students to understand how the data is represented on two maps and use that information **to compare and distinguish** the migration route for golden plover in fall and spring. This Level 4 interpretation task requires students **to analyze** data and identify which of the several conclusions are given correctly.

PISA 2015

**Bird Migration**  
Question 3 / 3

Refer to "Golden Plovers" on the right. Click on one or more boxes to answer the question.

Which statements about the golden plover's migration do the maps support?

✓ Remember to select one or more boxes.

- The maps show a decrease in the number of golden plovers migrating southward in the past ten years.
- The maps show that northward migratory routes of some golden plovers are different from southward migratory routes.
- The maps show that migratory golden plovers spend their winter in areas that are south and southwest of their breeding or nesting grounds.
- The maps show that the migratory routes of the golden plover have shifted away from coastal areas in the past ten years.

**BIRD MIGRATION**  
Golden Plovers

Golden plovers are migratory birds that breed in northern Europe. In autumn, the birds travel to where it is warmer and where more food is available. In spring the birds travel back to their breeding grounds.

The maps below are based on more than ten years of research on the migration of the golden plover. Map 1 shows the southward migratory routes of the golden plover during autumn, and map 2 shows the northward migratory routes during spring. Areas coloured grey are land, and areas coloured white are water. The thickness of the arrows indicates the size of the migrating groups of birds.

**Migratory Routes of the Golden Plover**

Map 1: Southward Migratory Routes      Map 2: Northward Migratory Routes

### 3.6.3.1 Rubric Scoring

Question Multiple choice	Answer	Score
<p>1. Most migratory birds gather in one area and then migrate in large groups rather than individually. This behaviour is a result of evolution. Which of the following is the best scientific explanation for the evolution of this behaviour in most migratory birds?</p> <p>a. Birds that migrated individually or in small groups were less likely to survive and have offspring.</p> <p>b. Birds that migrated individually or in small groups were more likely to find adequate food.</p> <p>c. Flying in large groups allowed other bird species to join the migration.</p> <p>d. Flying in large groups allowed each bird to have a better chance of finding a nesting site</p>	A	<p>If the Answer is Rigt = 15 point</p> <p>If the answer is wrong = 0 Point</p>
<p>2. Identify a factor that might make the volunteers' counts of migrating birds inaccurate, and explain how that factor will affect the count.</p>	Species	<p>If students' answer is right and relateble reason = 70</p> <p>if students ' answer is right but don't have ralaterble reason = 65</p> <p>if students answer is not right and not relatable = 0</p>
<p>3. Which statements about the golden plover's migration do the maps support?</p> <p>a. The maps show a decrease in the number of golden plovers migrating southward in the past ten years.</p> <p>b. The maps show that northward migratory routes of some golden plovers are different from southward migratory routes.</p> <p>c. The maps show that migratory golden plovers spend their winter in areas that are south and southwest of their breeding or nesting grounds.</p> <p>d. The maps show that the migratory</p>	A and B	<p>If the Answer is Rigt = 15 point</p> <p>If the answer is wrong = 0 Point</p>

routes of the golden plover have shifted away from coastal areas in the past ten years		
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