# CHAPTER IV
# DATA ANALYSIS, FINDINGS AND DISCUSSION

## A. Data Analysis

The data of this research were a transcript of interview recordings, the results of video recordings, and observations of teachers' challenges in project-based learning in tenth-grade classrooms.

### 1) The Ways Applied Project-Based Learning

During the writer's participation in the teaching and learning process, it was observed that the teacher applied characteristics based on Krajcik's theory (2014), including driving questions, learning goals, collaboration, scientific approach, technological tools, and creating an artifact. These characteristics guided the teacher during the project's start, progress, and end.

In the first meeting, it was observed that the teacher used driving questions as a characteristic in the project to inquire about the relationship between healthy food and the students' health in their real lives.

The second meeting observed that the teacher employed scientific practices and collaboration, used technological tools, and created an artifact. Scientific practice was implemented by asking students to identify key points to present in the next meeting. The teacher facilitated collaboration by asking students to form group tables and discuss the scientific practice. Then, using technological tools was aimed at helping students find definitions and translations of their completed papers. Students, in the form of a paper, completed the creation of an artifact.

In the third meeting, it was observed that the teacher used creating an artifact again. The teacher asked students to present their project results, which were completed as a paper. This aimed to ensure that students develop products that reflect an understanding of the studied topic.

**a. Driving Question**

The driving question, centered around the concept of "eating real food, not processed food," prompted students to critically analyze their dietary choices and understand the significance of nutrition. By emphasizing the importance of variety in food groups and the benefits of home cooking, students recognized that a balanced diet was crucial for overall health. Additionally, discussions about eating habits, such as the effects of overeating and the consequences of eating before sleeping, fostered self-awareness among students regarding their eating behaviors.

Tabel 4.1 Driving question mentioned by the teacher

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| **Teacher:** ….Does anyone know what ‘eat real food, not processed food’ means? It means eating food that’s… |
| **Teacher:** ….You can mix them with protein, or what else can you mix them with? |
| **Teacher:** …..If we cook too long, what happens to the fibre, nutrition, and vitamins? |
| **Teacher:** What happens if you keep eating until you’re full? |
| **Teacher:** Yes, it's not good to sleep right after eating. What can it lead to? |
| **Teacher:** You might feel dizzy if you eat in the car, right? |

**b. Learning Goal**

The learning goal of this project was to engage students in collaborative research on healthy foods and their benefits. By working in randomly assigned groups, students would have the opportunity to share diverse perspectives and

ideas. The assignment emphasized the importance of understanding what constitutes healthy foods, essential for making informed dietary choices. Additionally, writing a paper allowed students to articulate their findings and reflect on their eating habits.

Tabel 4.2 Learning goals mentioned by the teacher.

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| **Teacher:** …we're going to write a paper as a project about what healthy foods are. Okay? |
| **Teacher:** …You'll write about healthy foods and the benefits of the healthy foods you consume. |

**c. Scientific Practice**

The teacher emphasized the importance of dividing tasks among group members to ensure that each student focuses on a specific healthy food item. This practice encouraged students to identify and outline key information for their upcoming presentation. The teacher also highlights the necessity of memorization, suggesting that learning a few words at a time could lead to better retention of information. By allowing students to choice to write or use technology for their assignments, the teacher promoted autonomy in their learning process.

Tabel 4.3 Scientific Practice mentioned by the teacher

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| **Teacher:** So, your task now is to divide per member, one healthy food for one member…Your job is to outline which sentences are important to be presented directly next week. |
| **Teacher:** …Memorize a few words slowly. Those few words will later become sentences you can remember. |
| **Teacher:** …whether you want to write in books or take photos on your phone. Please translate it into Indonesian using the dictionaries you have. |
| **Teacher:** …Please translate your assignment into Indonesian, find the points based on your assignment, the points that you find, you will present next week, one student one healthy food. |

**d. Collaboration**

The teacher encourages collaboration by instructing students to form group tables, facilitating an environment for teamwork. The teacher fostered communication and collective problem-solving by prompting students to discuss their ideas for the upcoming presentation.

Tabel 4.4 Collaboration mentioned by the teacher

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| **Teacher:** | Good, now please form group tables. |
| **Teacher:** | Do you understand what you printed here |
| **Teacher:** | That's why I told you to form your group tables. I want you to discuss for next week's presentation. |

**e. Using Technological Tools**

The teacher provided specific guidelines for the format of the written paper, emphasizing the use of Times New Roman font, size 12, with 1.5 spacing. Students could choose between writing in books or taking photos on their phones, encouraging using available technological tools. The teacher also suggested seeking assistance from the computer teacher to format the paper and demonstrate the integration of various resources to support student learning.

Tabel 4.5 Using Technological Tools mentioned by the teacher

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|---|---|
| **Teacher:** | Oh yes, the paper should be written in Times New Roman, font size 12, with 1.5 spacing. |
| **Teacher:** | It's up to you, whether you want to write in books or take photos on your phone…. |
| **Teacher:** | Ask your computer teacher for help with the font style and size. |
| **Teacher:** | Yes, you can read with your phone. |

**f. Creating an Artifact**

The teacher checked the students' progress by asking if their projects were finished, indicating the importance of completing the assignment. By

instructing students to hand in their papers, the teacher emphasized the final step in the project process, reinforcing accountability and the value of their work.

Tabel 4.6 Creating an artifact mentioned by the teacher

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| **Teacher:** | Good. Is your project finished? |
| **Teacher:** | Alright, hand in your papers to me. |

**2) The Reasons Why Teacher used Project-Based Learning**

During the interview conducted by the researcher to the teacher. The researcher found the reason why the teacher used Project-Based Learning for the first time in teaching and also which is part of the goal of the independent curriculum. The following are the results of the interview found by the researcher.

**a The Reason for Emphasizing Practical Application in Learning**

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| **Teacher:** Okay, for the specific learning is I want the student know what are the particulate that they know … they can memorize, they can know, and they can implement in their real life |

Tabel 4.7 Learning Goal for The Project

These teachers' statements highlight the core goals of their instruction: to ensure that students acquire concrete knowledge, retain it through memorization and understanding, and, most importantly, are able to apply that knowledge effectively in real-life situations. Teachers aim for learning experiences that go beyond memorization by emphasizing the practical application and relevance of the subject matter. By focusing on particular knowledge – the specific, detailed components of a topic – teachers create a foundation for deeper understanding. This approach empowers students not only to memorize facts but also to use them as tools to navigate and engage with

the world around them, fostering connections between academic learning and everyday experiences.

**b The Reason for Teacher Satisfaction: Student Understanding and Confident Articulation**

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| **Teacher:** The advantages that I have observed from this final project, first students, I found some of student that can understand, that can explain the project what I think it makes me happy because they can speak with loudly, speak with brave and they can understand the material. |

Tabel 4.8 The Advantages from The Final Product of Project

Teachers expressed satisfaction with the final project, noting positive outcomes in terms of student understanding and confidence. She observed that several students successfully grasped the project concept and were able to articulate it clearly. This ability to explain the project, coupled with confident and assertive presentation skills, demonstrated a deeper understanding of the material. Teachers' satisfaction came from seeing students not only understand the subject matter but also develop the communication skills necessary to express their knowledge effectively. This suggests that the final project was a successful tool for developing both content mastery and valuable presentation skills.

**c The Reason for Project Success: Fostering Resourcefulness and Problem-Solving Skills**

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| **Teacher:** … I will try to them to speak English but yeah for this project it helps them according to create the project while they can find the solution from the internet about healthy food and they can finish the project well. |

Tabel 4.9 The Final Result from The Project

The teacher reflected on the project's success in fostering practical skills and resourcefulness among students, despite a linguistic challenge. While

aiming to encourage English language practice, the teacher acknowledged that the project itself proved beneficial. Specifically, students demonstrated the ability to independently research solutions related to healthy food online and successfully complete the project. This indicates that the project facilitated the development of problem-solving skills, information literacy, and the ability to apply research findings to a tangible outcome. Although the language goal wasn't fully realized, the project empowered students to take initiative, utilize available resources, and achieve a concrete result, highlighting the project's value in promoting self-directed learning.

**B. Findings**

The project facilitated personal advancement for both students and the teacher. As students engaged in collaborative research and presentations, they developed essential skills such as teamwork, communication, and critical thinking. The teacher's observations revealed satisfaction in witnessing students' progress and ability to articulate their understanding of the material confidently. Overall, this project-based learning experience enriched students' knowledge of healthy foods and contributed to their personal growth and development as learners.

The teacher effectively employed project-based learning characteristics to enhance student engagement and understanding of healthy eating. The predominant use of the Driving Question, which focused on "eating real food, not processed food," encouraged students to critically evaluate their dietary choices and recognize the importance of nutrition. This approach facilitated discussions about healthy eating habits and fostered self-awareness among students regarding their eating behaviors.

Additionally, the learning goals established for the project emphasized collaborative research, allowing students to work in randomly assigned groups. This structure provided diverse perspectives and collective problem-solving opportunities, ultimately enriching the learning experience. By writing a paper on healthy foods and their benefits, students could articulate their findings and reflect on their eating habits, reinforcing the significance of informed dietary choices.

Furthermore, the teacher's integration of scientific practices, collaboration, and technological tools was crucial in supporting student learning. By dividing tasks among group members and promoting autonomy in how students approached their assignments, the teacher fostered an environment conducive to active participation. Overall, this project enhanced students' knowledge of nutrition and contributed to their personal growth and development as learners, highlighting the effectiveness of project-based learning in educational settings.

## C. Discussion

This study aimed to demonstrate the project-based learning from characteristics used by teacher to apply it. Some points were crucial to be discussed after analyzing the data and getting the findings.

The previous study conducted by (Gama, 2023) revealed that there were six characteristics used by the teacher when applying project-based learning based on (Krajcik, 2014) theory, namely Driving Question, Learning Goal, Scientific Practice, Collaboration, Using Technological Tools, and Creating an Artifact. In this study of project-based learning, the teacher implements it

mainly through the lens of Krajcik's theory. The predominant characteristic utilized was the Driving Question, which focused on "eating real food, not processed food." This question effectively prompted students to critically analyze their dietary choices and understand the significance of nutrition. The emphasis on variety in food groups and the benefits of home cooking enhanced students' knowledge and fostered self-awareness regarding their eating habits.

The researchers' research agreed that collaboration was critical to the success of PjBL. Gama's study (Gama, 2023) supported this by noting the importance of cooperation between students and teachers, while the second analysis illustrates how collaborative research improved student engagement and learning outcomes. Additionally, both studies acknowledge that PjBL enriches academic knowledge and fosters personal growth among students, equipping them with essential skills for future challenges. Overall, while Gama's study provided a broader framework for successful PBL implementation, the researchers' analysis offered valuable insights into addressing specific barriers faced by students. Together, this underscores the multifaceted nature of project-based learning as a practical pedagogical approach that requires careful planning, clear communication, and ongoing support to maximize its benefits for student development.

In support, (Septina et al., 2023) research was related to this research. Both studies underscore the importance of teacher engagement and effective communication in facilitating successful PjBL experiences. While Septina et al. emphasize the need to complete all project phases to improve student learning outcomes, this highlights how targeted prompts can engage students in critical thinking and foster deeper learning relationships. Together, these studies

suggested that a comprehensive approach to PjBL—encompassing all phases and addressing student challenges—could significantly improve engagement and learning outcomes in English language education.

In addition to driving questions and collaborative efforts, the teacher's integration of scientific practices and technological tools was crucial in supporting student learning. By dividing tasks among group members and promoting autonomy in how students approached their assignments, the teacher created an environment conducive to active participation. Overall, this project-based learning experience enhanced students' understanding of nutrition and contributed to their personal growth and development as learners, highlighting the effectiveness of such pedagogical strategies in educational settings.