

CHAPTER III

RESEARCH METHODOLOGY

This chapter provides information about the research methodology employed in this research to find out the answer to the research questions. In particular, this chapter consists of the research design, research site and participants, data collection, and data analysis.

3.1 Research Design

The study aimed to discover the factors influencing students' motivation when using the Duolingo application for English learning and investigate whether Duolingo could help learners promote learners' autonomy. Based on this objective, the research was conducted using qualitative methods to comprehensively understand the topic. Creswell and Creswell (2018) stated that qualitative approach emphasizes exploring phenomena through detailed, in-depth understanding of participants' perspectives. Moreover, Hancock (2002) also stated that qualitative research is research that aims to understand aspects of social life, and the data used for analysis in this method, in general, uses words rather than numbers. Therefore, this method can offer an in-depth exploration of students' motivations and experiences. Specifically, this research was also done using an exploratory case study approach. A qualitative exploratory case study is employed to gain an in-depth understanding of complex phenomenon within real-life context by utilizing methods such as interviews to explore emerging patterns and themes (Yin, 2018). Since this study explore varied aspects of a phenomenon, namely exploring factors influence students' motivation, this approach was appropriate to be chosen.

3.2 Research Site and Participants

The research site of this study was conducted at one of the public high schools in West Java because it had regulations allowing students to bring smartphones to school. Ownership of smartphones was very important in this study because participants needed to use the Duolingo application as part of the research procedure. Moreover, this school was selected due to its proximity to the researcher's location, facilitating easy access.

Three classes from the second graders of senior high school, 87 students, were chosen as the participants. Two classes are classes specifically for learning advanced English. Meanwhile, one class is a class that studies English in general. This was done to obtain a sample that reflects the population's diversity more accurately. Thus, this would reduce bias and limit the generalizability of the findings.

Moreover, the researcher used purposive sampling to capture diverse students' perspectives that are most relevant to the aims of the research for the interview section. Purposive sampling is frequently utilized in qualitative studies (Nikolopoulou, 2023). According to Creswell and Creswell (2018), in purposive sampling, the researcher selects participants who possess specific characteristics or experiences relevant to the research questions. In this study, the researcher purposively selected 4 students, who previously participated in the quantitative phase, and who showed high and low motivation levels. By purposefully selecting participants with these characteristics, it is hoped the researcher can gather rich detailed insights into the factors that influence students' motivation.

Before conducting the research, the researcher asked permission from the participants in this research by distributing a consent form, as the ethical requirement in social research confirms the participants' free will in choosing to participate in the study. In the process of getting participants' approval in filling out the consent form, the researcher explained the purpose of the research, the reason why they were chosen as participants, the activities that will be carried out, the duration of the research, and how the data obtained will be used. The researcher, also, explained that their participation was voluntary and they were free to withdraw from this research without having to give a reason and without any consequences. In addition, any information recorded in the investigation will remain confidential. The identities of the participants and the research location will be anonymous and will not be made publicly available.

3.3 Data Collection

Before the data collection, the students, as participants of this study, were instructed to use Duolingo for 14 days to address the research questions. After obtaining the participants' consent, the researcher provided a brief explanation of

gamification and the factors influencing motivation according to self-determination theory. Additionally, the participants were thoroughly informed about the procedures involved in this study. Once the participants understood the research procedures, they were instructed to use Duolingo for 14 days without any minimum or maximum usage time and without any restrictions on where they should use it. Furthermore, the researcher abstained from any actions that might influence the students' motivation to use Duolingo during the study. At the end of the study, the researcher met with the participants again to collect data from questionnaires and interviews, as well as evidence of Duolingo usage over the 14 days in the form of screenshots of daily streaks on Duolingo.

To collect the data for this study, the researcher used questionnaires and semi-structured interviews. According to Bhattacharjee (2012), the questionnaire is most appropriate for research where the unit of analysis is individual human subjects. While, the interview is the best instrument of data collection in qualitative research (Jamshed, 2014), to obtain in-depth information from the participant regarding the subject of investigation (Module 4: Methods of Information Collection - Section 1, 2001).

Since this research used questionnaires and interviews to collect the data, it means that this research used methods of triangulation. Bhandari (2023) and Alele and Malau-Aduli (2023) stated that triangulation means using multiple data and methods, more than one angle, to obtain more comprehension and understanding of a research problem.

3.3.1 Questionnaire

To collect data in the quantitative phase, the researcher used a questionnaire as the instrument to obtain quantitative data from a large sample. According to Munasiroh (2023), questionnaires are suitable for large-scale surveys covering a broad area with a large number of respondents. The main objective of this questionnaire was to quickly gather information about the characteristics of a large sample of individuals of interest (Ponto, 2015). Bhattacharjee (2012) added surveys or questionnaires serve as an effective method for assessing a broad range of data that cannot be directly observed, such as behaviours.

In developing the questions, the researcher used the Likert scale to obtain statistical insights and distribution of factors influencing students' motivation to learn English using Duolingo and promoting learners' autonomy based on Self-Determination Theory (SDT). The questionnaire consists of 23 items that can be grouped into seven sections of the questionnaire, that is:

Table 3.1 Indicators of the Questionnaire

NO	Indicators	Number of Items	Total
1	Demographic Information	1, 2	2
2	Autonomous Learner	3, 4, 5, 6, 7, 8, 9	7
3	Autonomy	10, 11, 12	3
4	Competence	13, 14, 15	3
5	Relatedness	16, 17, 18	3
6	Intrinsic and extrinsic motivation	19, 20	2
7	Challenges and motivation when using Duolingo	21, 22	2
Total			22

In gathering information using a questionnaire, this study also distributed closed and open-ended questionnaires to the respondents. There were 21 close-ended questionnaires and two open-ended questionnaires. The close-ended questions were scored on a five-point Likert scale. The open questionnaire was designed to gather information which is a statement that cannot be captured by close questions (Popping, 2015). The questionnaires were translated into *Bahasa Indonesia* and administered to the students at the last meeting in an online way.

3.3.2 Semi-structured Interview

Fisher (2012) suggests that relying solely on questionnaires is not a dependable method for gathering information about student software usage and should not be used as a single source of data. Therefore, to get an in-depth exploration of the underlying reasons behind the factors influencing students' motivation and whether Duolingo could help students promote learners' autonomy, also enhance the accuracy of the data collected, the researcher used interviews as a qualitative instrument. Coles and Mcgrath (2013) argue that

interviews offer a rich source of information, particularly suitable for understanding individuals' perspectives on an issue and exploring their attitudes or beliefs in depth.

After the quantitative data had been collected, the researcher conducted semi-structured interviews that used open-ended questions, allowing for flexibility in probing specific topics while encouraging participants to elaborate on their responses (George, 2023). An interview protocol was also developed to help facilitate the process. To minimize any potential language barriers, the interview was conducted in Indonesian, which was the first language of both the participant and the researcher. Furthermore, the researcher employed one-on-one interviews, a data collection method involving individual participants being asked questions and their responses recorded one at a time (Mutmainah, 2022). Despite being time-consuming, this approach encouraged each interviewee to freely convey their answers. To ensure that no information from this interview was missed, all interview activities were voice-recorded using a recording application after obtaining permission from the interviewee.

Four students were selected through purposive sampling based on motivation levels and usage of the Duolingo application. There were 12 questions posed to the participants about students' motivations and learners' autonomy. This enables the researcher to gather detailed and supplementary information that may be lacking in the quantitative research findings.

3.4 Data Analysis

After collecting the data, the students were divided into two groups: students with high motivation and students with low motivation, based on the frequency and duration of Duolingo usage per day and the participants' daily login streaks over 14 days. After forming these two participant groups, the data were analyzed using descriptive statistics for the Likert scale questionnaire data and thematic analysis for the interview and open-ended questionnaire data. For the Likert scale questionnaire, the frequency, mean, and standard deviation for each theme within the two participant groups were calculated and then compared to address the research questions. Additionally, several codes from the coding

process were presented as supplementary information to support the findings from the descriptive analysis.

3.4.1 Validity and Reliability Test

To ensure the validity and reliability of the instruments used in this study, both the questionnaire and interview protocols were evaluated. For the questionnaire, Pearson product moment correlation coefficient and Cronbach Alpha reliability test was conducted to test its clarity and relevance, leading to refinement based on feedback to enhance content validity and internal consistency. Further, the interview protocols underwent expert review to ensure construct validity and were tested in a preliminary phase to check for reliability in capturing the intended dimensions of students' motivation and autonomy. Both data collection methods were used to facilitate triangulation, thereby strengthening the overall reliability and validity of the research findings.

3.4.1.1 Validity Test

To assess the validity of the research instrument, content validity was initially evaluated through expert review. Additionally, SPSS 27 was employed to determine the precision of the instrument. The Pearson product moment correlation coefficient was utilized for this validity assessment, with the decision criterion based on a significance level of 0.05. Specifically, if the correlation coefficient exceeds 0.207, the sample is deemed sufficient and valid. The validity test results for each research instrument are summarized in the table below.

Table 3.2 The Result of Validity Test

Items	Value of r Table	Correlation value (r-count)	Description
Q1	0.207	0.611	Valid
Q2	0.207	0.442	Valid
Q3	0.207	0.564	Valid
Q4	0.207	0.644	Valid
Q5	0.207	0.512	Valid
Q6	0.207	0.513	Valid
Q7	0.207	0.533	Valid
Q8	0.207	0.683	Valid

Q9	0.207	0.543	Valid
Q10	0.207	0.513	Valid
Q11	0.207	0.624	Valid
Q12	0.207	0.466	Valid
Q13	0.207	0.482	Valid
Q14	0.207	0.518	Valid
Q15	0.207	0.510	Valid
Q16	0.207	0.646	Valid
Q17	0.207	0.524	Valid
Q18	0.207	0.560	Valid
Q19	0.207	0.638	Valid
Q20	0.207	0.632	Valid

From the table above, it is known that all question items have a value of r count bigger than r table. It can be concluded that items on the questionnaire are valid.

3.4.1.2 Reliability Test

The reliability test is used to see whether the questionnaire has reliability and consistency if measurements using the questionnaire are carried out repeatedly. The Cronbach Alpha reliability test was used in this study. The reliability test criteria are if the alpha value is > 0.60 , it means that the statement is reliable. If the alpha value is ≤ 0.60 , it means that the statement is unreliable. The reliability test results will be displayed in more detail in the table below.

Table 3.3 The Result of Realibility test

Items	Standard Cronbach's Alpha	Cronbach's Alpha	Description
Q1	0.60	0.833	Valid
Q2	0.60	0.838	Valid
Q3	0.60	0.816	Valid
Q4	0.60	0.820	Valid
Q5	0.60	0.822	Valid
Q6	0.60	0.824	Valid

Q7	0.60	0.827	Valid
Q8	0.60	0.827	Valid
Q9	0.60	0.824	Valid
Q10	0.60	0.819	Valid
Q11	0.60	0.828	Valid
Q12	0.60	0.824	Valid
Q13	0.60	0.825	Valid
Q14	0.60	0.811	Valid
Q15	0.60	0.813	Valid
Q16	0.60	0.826	Valid
Q17	0.60	0.830	Valid
Q18	0.60	0.828	Valid
Q19	0.60	0.820	Valid
Q20	0.60	0.836	Valid

The reliability test results in the table show that the alpha value is more than 0.60. It can be concluded that all question items in the questionnaire are reliable.

3.4.2 Analyzing the Data from Questionnaire

In quantitative Analysis, the researcher employed descriptive statistics to analyze questionnaire data. The main objective of descriptive statistics is to offer a clear and compact summary of the data (Cooksey, 2020). This quantitative data shows the factors affecting students' motivation to use Duolingo. The data used in the questionnaire was a five-point Likert scale with anchors ranging from 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. Before the analysis, participants were grouped into two groups, students with high motivation and students with low motivation. Then, quantitative data collected from the questionnaire were entered into a statistical analysis software program, SPSS, to find the score of means, standard deviations, and percentages of each section to summarize the quantitative data.

From the results of the analysis, the difference in the mean scores of the two groups was shown. If the mean score for the group of students with high

motivation is greater than the mean score for the group of students with low motivation, then it can be concluded that the factor being studied influences student motivation. Additionally, the researcher highlighted the statements with the highest and lowest mean from the questionnaire to find out how students perceived factors that influence student motivation and learners' autonomy. After the analysis, the data was visualized to make it easier to understand.

Table 3.4 Likert 5-point scale Range of Mean

Range (M)	Scale
1.00–1.80	Totally disagree
1.81–2.60	Disagree
2.61–3.40	Moderately agree
3.41–4.20	Agree
4.21–5.00	Totally agree

3.4.3 Analyzing the Data from the Interview

After the data from the interview were collected, the data was transcribed verbatim and imported into Microsoft Excel, then analyzed and utilized thematic analysis to identify recurring themes from semi-structured interview transcripts. As stated by Braun and Clarke, (2022) thematic analysis is a valuable approach for investigating the viewpoints of diverse research participants. Thematic coding is a type of qualitative analysis where segments of text or visuals are identified and recorded based on similar themes or concepts (Caulfield, 2023), allowing the researcher to classify the material into categories and therefore construct a "framework of thematic ideas about it" (Gibbs, 2007).

The six-phase theme analysis guide by Braun and Clarke (2006) was utilized as a reference to assist in the analysis process. First, familiarizing with the data; second, creating initial code; third, identifying themes; fourth, reviewing themes; fifth, defining themes; and sixth, making the report, which is the fourth chapter of this study. The interview data Initial codes were generated to identify meaningful patterns and themes related to students' motivations. After the data is classified into similar codes and put the codes into the theme, the researcher will also interpret the data to gain deeper findings.

Table 3.5 Coding the Data of the Interview

Themes	Codes	Student	Conclusion
Autonomy	free to choose the place and time		
	free to determine learning goals		
Competence	Language skills		
	Duolingo features		
Relatedness	Interaction with peers		
	Interaction with other Duolingo users		
Motivation	Intrinsic		
	Extrinsic		
Learners' autonomy	Responsibility for own learning		
	Solving problems		