

CHAPTER IV

FINDINGS AND DISCUSSION

This chapter presents the findings and discussion of the study based on the data collected through questionnaires and interviews. The findings are organized according to the two research questions, followed by a discussion that interprets the results in relation to relevant theories and previous studies.

A. Findings

This section presents the research findings based on data collected through questionnaires and interviews. These findings are organised in accordance with the two research questions in this study. The first research question examined how the integration of QR codes into English learning book in the Independent Curriculum affects student interaction in the classroom. The findings for this questions were derived from questionnaire responses completed by 62 students and analysed according to five aspects : students interest in learning, student engagement in the classroom, ease of use, time efficiency, and flexibility in accessing information. The second research question examined the teaching strategies devised by teachers to integrate QR codes into English language learning. The findings relating to this question were obtained from an interview with an English teacher and categorised into several themes relating to the use of QR codes in classroom teaching.



Figure 4.1 The student fill the questionnaire

Before presenting the findings, it is important to describe the QR Codes used in the English learning book. This study used the textbook Bahasa Inggris Life Today for Grade XII Senior High School published by the Ministry of Education, Culture, Research, and Technology. The QR Codes embedded in this textbook are static QR Codes that provide direct access to digital learning resources, particularly listening audio, pronunciation practice, and supplementary learning materials.

During the classroom observation, the teacher primarily utilized these QR Codes during listening activities, allowing students to scan the codes using their smartphones before completing classroom tasks and discussions. This implementation served as the basis for examining students' perceptions and teachers' instructional strategies in this study.

1. The Integration of QR Codes in English Learning Books in the Independent Curriculum and Its Effect on Student Interaction in the Classroom

The research findings were obtained from a questionnaire administered to students regarding the use of QR codes in English learning books. The data were analyzed based on five main aspects: learning interest, student engagement, ease of use, time efficiency, and flexibility of information access. In general, the results show that the majority of students responded positively to the use of QR codes. These findings suggest that integrating technology into learning not only enhances learning motivation but also strengthens student interaction in the classroom. The findings of each aspect are presented in the following sections :

a. students interest in learning

This section examines whether the use of QR codes increases students interest and motivation in learning English based from the questionnaire.

1) Increase excitement in learning english through the use of QR Codes

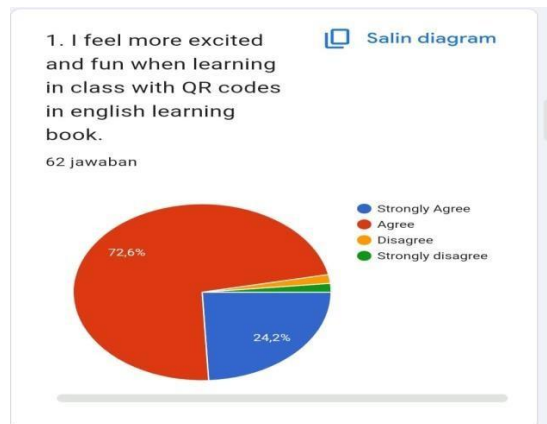


Figure 4.1 result for question 1

In the first question, the researcher asked how excited and fun the learning process in class was when using QR codes in English textbooks. A total of 72.6% of students agreed and 24.2% strongly agreed that learning with QR codes felt more enjoyable than conventional methods. This indicates that the use of technology can create a more interactive and less monotonous learning environment, so that students do not get bored quickly and can remain focused on learning.

2) Enhancement of Interest in Learning English

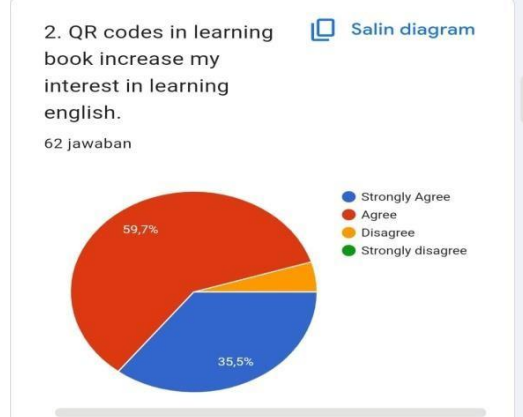


Figure 4.2 result for question 2

In the second question, the researcher asked about students interest in learning English after using QR codes. The results showed that 59.7% of students agreed and 35.5% strongly agreed that QR codes can significantly increase students interest in learning English. This is because students gain a more varied learning experience through access to audio and supplementary materials, so that learning is not confined to the text in the book only.

3) Increased Motivation to Learn After Using QR Codes

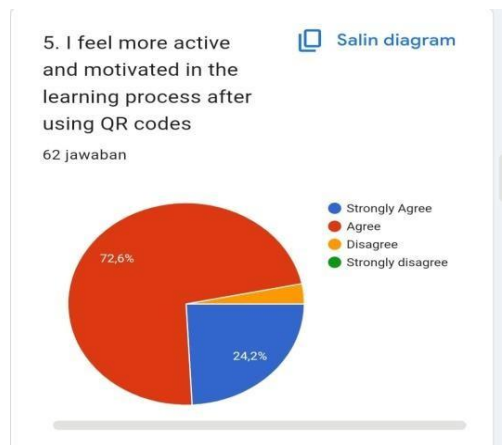


Figure 4.3 result for question 5

In the fifth question, the researcher asked whether students felt more motivated to learn English after using QR codes. 72.6% of students agreed and 24.2% strongly agreed that the use of QR codes can increase students' motivation to participate in learning. This is due to the ease of use and the benefits experienced by the students.

4) Increased Attention of Student and Make Learning English More Fun

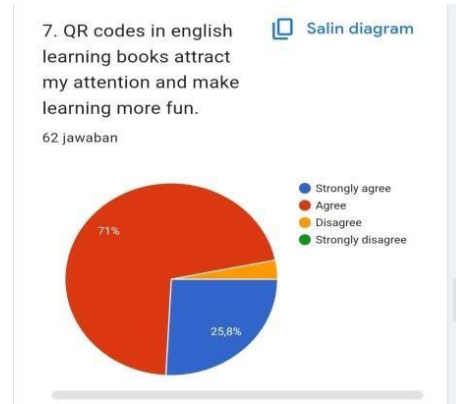


Figure 4.4 result for question 7

In the seventh question, the researcher asked whether the use of QR codes in this English learning book could capture students' attention during learning. 71% of students agreed and 25.8% strongly agreed that the use of QR codes was able to capture students' attention and make them more engaged in the learning process. This indicates that the visual and interactive elements of this technology play an important role in increasing students' interest and attention.

The results showed overwhelmingly positive responses. In question 1,

72.6% of students agreed and 24.2% strongly agreed that learning English became more enjoyable through QR Codes. Similarly, in question 2, 59.7% agreed and 35.5% strongly agreed that QR Codes increased their interest in learning English. Regarding learning motivation, 72.6% agreed and 24.2% strongly agreed that QR Codes motivated them to participate in learning activities. Furthermore, 71% agreed and 25.8% strongly agreed that QR Codes successfully attracted their attention and made learning more enjoyable. These findings indicate that QR Codes positively influence students' learning interest and motivation. The integration of audio materials, videos, and additional resources creates a more engaging learning environment compared to traditional learning methods.

b. Student Involvement in Class

This aspect focused on students participation, engagement, collaboration, and interaction during classroom learning activities. The relevant questionnaire were :

1) Improved Focus and Engagement During Learning English

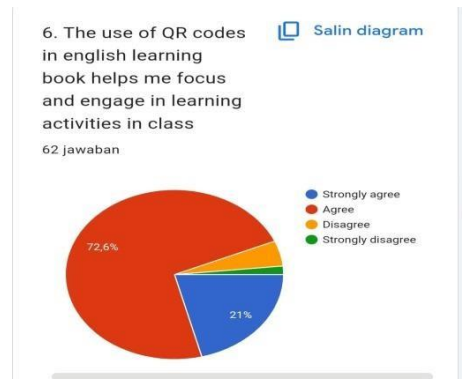


Figure 4.5 result for question 6

In the sixth question, the researcher asked whether the use of QR codes helps students stay focused and engaged in English language learning in the classroom. A total of 72.6% of students agreed and 21% strongly agreed that students show a higher level of focus when using QR codes. This is because learning becomes more interactive and incorporates various media. In accordance with the theory of Structured Classroom Discussion (Brookfield, 2012), the use of relevant learning resources can improve student concentration.

2) Enhancing Collaborative Learning in the Classroom

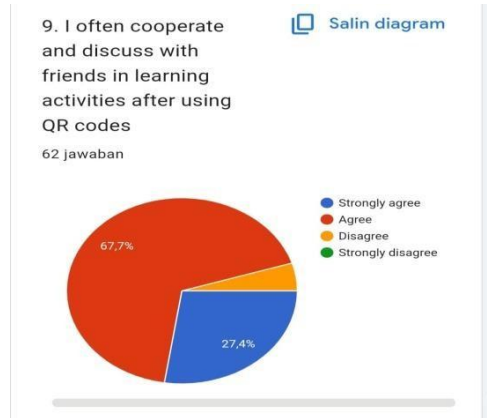


Figure 4.6 result for question 9

In the ninth question, the researcher asked whether the use of QR codes in English learning book could foster collaboration among students through discussion. 67.7% of students agreed and 27.4% strongly agreed that the use of QR codes encourages students to discuss and work together in groups, thereby fostering collaborative activities in the classroom. This is evident from the increased interaction among students when accessing and discussing information from QR codes.

3) Students Active Participation in Classroom Activities

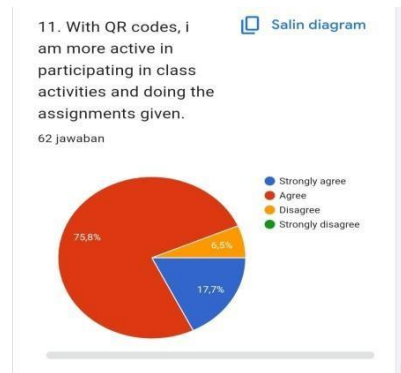


Figure 4.7 result for question 11

In the eleventh question, the researcher asked about student engagement during the learning process using QR codes in the English learning book. The results showed that 75.8% of students agreed, 17.7% strongly agreed, and 6.5% disagreed. Most students became more active in participating in learning activities and completing assignments. This indicates that technology can transform students' roles from passive to active. A small number of students were not very active in the learning process.

The findings revealed that 72.6% of students agreed and 21% strongly agreed that QR Codes helped them remain focused and engaged during learning activities. Regarding collaboration, 67.7% agreed and 27.4% strongly agreed that QR Codes encouraged discussion and cooperation among classmates. In question 11, 75.8% agreed and 17.7% strongly agreed that they became more active participants in classroom activities after using QR Codes. These results suggest that QR Code integration promotes active classroom interaction, collaborative learning, and greater student participation. Students no longer act as passive recipients of information but actively engage with learning materials and classroom discussions.

c. Ease of Use

This aspect examined students' perceptions regarding the accessibility and convenience of QR Codes. The relevant questionnaire were:

1) Ease of understanding materials using QR Codes

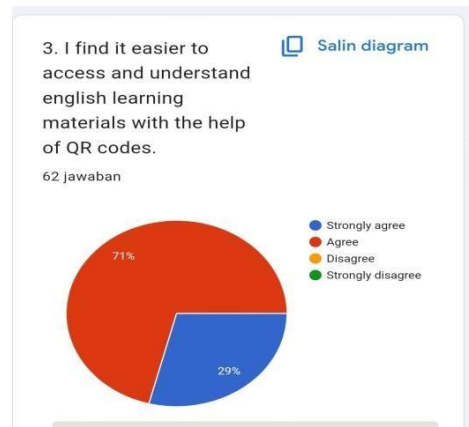


Figure 4.8 result for question 3

In the third question, the researchers asked how these QR codes helped students access the material in the English learning book. A total of 71% agreed and 29% strongly agreed that they found it easier to understand the material because the QR codes provided clearer, audible explanations, with the technology helping to simplify difficult concepts through more engaging media.

2) Prefer QR code-based learning rather than traditional learning

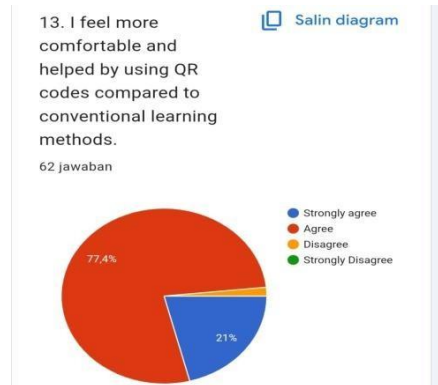


Figure 4.9 result for question 13

In the thirteenth question, the researcher asked about the convenience of using technology during learning and compared it to traditional methods. 77.4% of students agreed and 21% strongly agreed that students prefer learning using QR codes over traditional methods. This indicates a shift in learning preferences toward digital learning in line with the changing times.

The findings showed that 71% of students agreed and 29% strongly agreed that QR Codes made learning materials easier to access and understand. Additionally, 77.4% agreed and 21% strongly agreed that learning through QR Codes was more comfortable and convenient than traditional methods. These findings indicate that students perceive QR Codes as user friendly tools that simplify access to learning materials and improve learning experience.

d. Time Efficiency

This aspect explored whether QR Codes helped students save time during learning activities. The relevant questionnaire were:

1) Efficiency in accessing information using QR

Codes compared to traditional methods

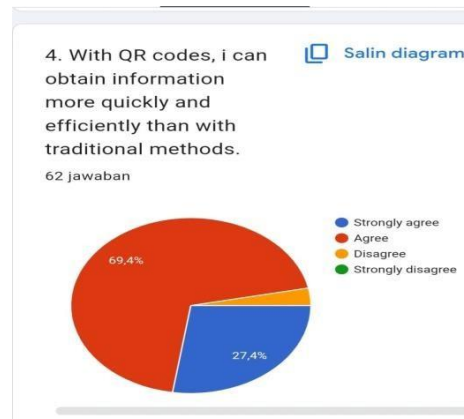


Figure 4.10 result for question 4

In the fourth question, the researcher asked how efficient the use of QR codes is for accessing information compared to relying solely on books. 69.4% of students agreed

and 27.4% disagreed that QR codes allow them to obtain information more quickly. Compared to manual searching, QR codes provide instant access to learning resources. This indicates that technology plays a role in improving the efficiency of the learning process.

2) Saving Time in the Learning Process by Using QR Codes

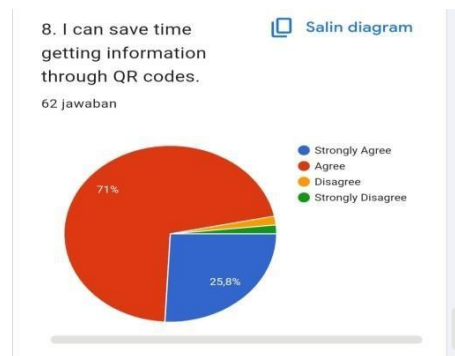


Figure 4.11 result for question 8

In the eighth question, the researcher asked whether the use of QR codes in this English learning book helps students save time. The results showed that 71% of students agreed and 25.8% strongly agreed that the use of QR codes helps them save time when searching for information. With a single scan, they can immediately access supplementary materials without having to search for them manually.

The results showed that 69.4% agreed that QR Codes provided quicker access to information compared with traditional methods. Similarly, 71%

agreed and 25.8% strongly agreed that QR Codes helped save time when searching for learning materials. These findings demonstrate that QR Codes contribute to more efficient learning by providing immediate access to educational resources through a simple scanning process.

e. Flexible Information Acquisition

This aspect investigated students ability to access learning materials independently and develop English skills through QR Code integration. The relevant questionnaire were :

1) Development of Independent Learning Skills

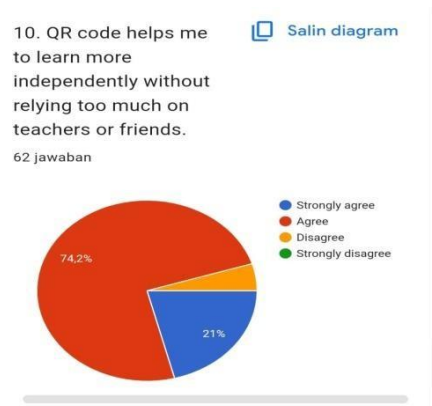


Figure 4.12 result for question 10

In the tenth question, the researchers asked whether the use of QR codes helped students access learning materials on their own without having to wait for the teacher. A total of 74.2% of students agreed and 21% strongly agreed that QR codes help students learn independently by providing direct

access to various learning resources. This supports the concept of autonomous learning, in which students have greater control over their own learning process.

2) Increased Confidence in Speaking English Skills

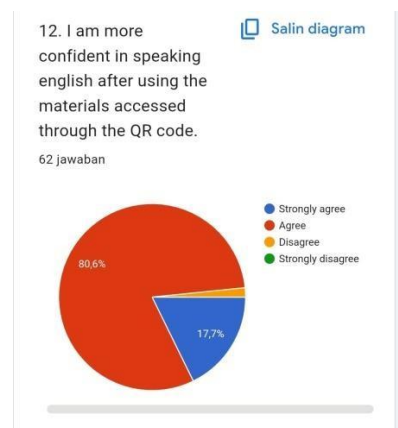


Figure 4.13 result for question 12

In the twelfth question, the researcher asked about students' confidence in speaking English. 80.6% of students agreed and 17.7% strongly agreed that they felt more confident speaking English after using materials accessed via QR codes, such as audio and reading texts. This indicates that exposure to authentic materials helps improve students' communication skills.

3) Increasing the Frequency of Reading and Listening to English

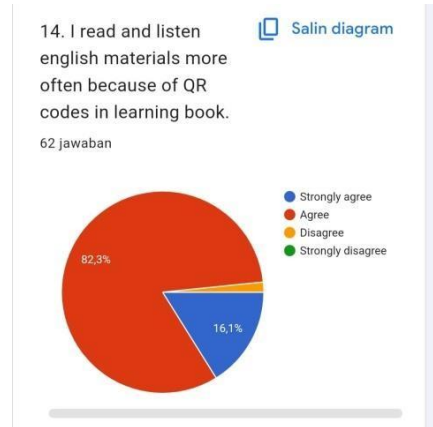


Figure 4.14 result for question 14

In the fourteenth question, the researcher asked whether the presence of QR codes enables students to read and listen to the material in the English learning book more frequently. 82.3% of students agreed and 16.1% strongly agreed that students read English material more frequently due to easy access via QR codes. This indicates that technology can increase the intensity of student learning.

4) Improvement in English Language Skills

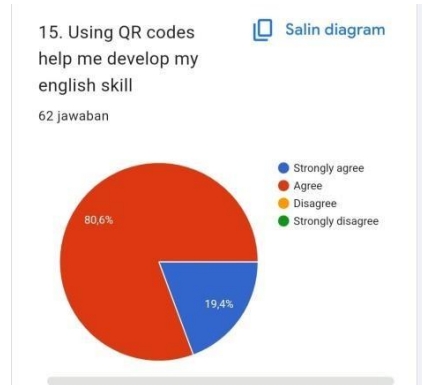


Figure 4.15 result for question 15

In the final question, the researcher asked whether the use of QR codes could improve students' English skills. The results showed that 80.6% of students agreed and 19.4% strongly agreed that they had experienced an improvement in their English skills after using QR codes. This included reading, listening, and speaking skills.

The findings indicated that 74.2% agreed and 21% strongly agreed that QR Codes supported independent learning. Regarding speaking confidence, 80.6% agreed and 17.7% strongly agreed that QR Code resources improved their confidence in speaking English. Furthermore, 82.3% agreed and 16.1% strongly agreed that QR Codes encouraged them to access English materials more frequently. Finally, 80.6% agreed and 19.4% strongly agreed that QR Codes contributed to the improvement of their English language skills. These

findings suggest that QR Codes provide flexible access to learning resources anytime and anywhere, supporting autonomous learning and English language development.

2. Teaching Strategies Designed by Teachers to Integrate QR Codes into English Language Learning in the Independent Curriculum

The findings of this section were obtained from an interview with an English teacher who has experience using QR Codes in English learning books under the Independent Curriculum. The interview explored how the teacher designed learning activities, implemented QR Codes during classroom instruction, collected students feedback, and developed teaching strategies based on classroom experiences. The interview data were categorized into five themes: collaborative and group learning, problem-based learning, flexible and engaging activities, reflection and feedback, and teacher training and support.



Figure 4.19 The teacher responds the questions from researcher

The result contains 5 aspect based on teacher strategies from interviewed :

a. Collaboration and Group Learning

The interview showed that collaborative learning was one of the main strategies used when integrating QR Codes into English lessons. Rather than asking students to work individually, the teacher divided the class into small groups of three or four students. Each group scanned the QR Code provided in the English learning book using their smartphones to access audio recordings or reading materials.

As the teacher said :

“... Usually, I divide the students into small groups consisting of three or four members. Each group can scans the QR Code in the English learning book using their smartphones... I think this way is more effective because students learn from each other. Instead of only listening to my explanation “

Based on the finding, QR Codes were not only used as a medium for accessing learning resources but also as a tool to facilitate collaborative learning. Students actively discussed the materials, exchanged ideas, and presented their findings to the class. These activities encouraged peer interaction and created a more student-centered learning environment.

b. Problem-Based Learning (PBL)

The interview showed that the teacher implemented activities that reflected the principles of Problem-Based Learning (PBL), although they were not always formally identified as PBL lessons.

As the teacher said :

“....although I don't always formally mention it as Problem-Based Learning, I often use activities that have similar principles. For example, I give students a situation or a problem related to the lesson, then I ask them to scan the QR Code to find information that can help them solve it. “

Based on the finding that QR Codes supported inquiry-based learning by allowing students to search for information independently before discussing possible solutions with their peers. The teacher mainly acted as a facilitator while students actively explored learning resources and constructed their own understanding.

c. Flexible and Engaging Activities

The interview also showed that the teacher intentionally designed varied learning activities to maintain students interest and motivation during English lessons.

As the teacher said :

“I try not to make every lesson the same because it's boring and some students did not focus on the class.”

The teacher also added :

“QR Codes I used for listening section mostly because there is an audio that has been prepared.”

The findings demonstrated that QR Codes enabled the teacher to create more flexible learning activities by combining digital resources, worksheets, discussions, and games. Such variation helped maintain students' motivation and encouraged greater participation during classroom learning.

d. Reflection and Feedback

The interview showed that reflection and feedback were important components in improving the implementation of QR Code-based learning activities. After completing classroom activities, the teacher usually asked students simple questions regarding their experiences using QR Codes.

As the teacher said :

“ After the learning activity, I usually ask students simple questions such as whether the QR Code was easy to use or the material helped them understand the lesson while accessing it. Sometimes I ask these questions directly during classroom discussion.”

The teacher also mentioned one of the practical challenges:

"For using the QR Codes for learning, it's quite difficult because in this school students are not allowed to bring handphones except when the lesson requires them, such as listening activities."

The findings indicated that reflection allowed the teacher to evaluate classroom activities continuously. Students' opinions became valuable information for improving future learning activities, while practical issues such as internet connectivity and smartphone policies were also considered when planning subsequent lessons.

e. Teacher Training and Support

The interview showed that the teacher had not received formal training specifically related to QR Code integration in English language teaching.

As the teacher said :

"To be honest, I have never attended a training program that specifically discussed the use of QR Codes in English language teaching..."

But the teacher expressed the importance of continuous professional

development:

“In my opinion, teachers should continue learning and adapting to technology because students today are already familiar with digital learning. Even without formal training, we can still integrate QR Codes effectively as long as we are willing to explore and adjust them to our students needs.”

The findings suggested that successful QR Code integration depends not only on formal professional development but also on teachers' willingness to learn independently, collaborate with colleagues, and continuously adapt technological innovations to meet students learning needs.

This study employed an explanatory sequential mixed-methods design in which the qualitative findings were used to explain and strengthen the quantitative results. The questionnaire findings showed that students generally had positive perceptions of the integration of QR Codes into English learning books. The interview findings with the English teacher further explained how these positive perceptions were supported through the teacher's instructional strategies in the classroom.

The questionnaire showed that QR Codes increased students interest, motivation, and enjoyment in learning English. Most students agreed that learning became more engaging and enjoyable when QR Codes were used. These findings were supported by the interview, in which the teacher explained that learning activities were intentionally varied by combining QR Codes with listening activities, worksheets, discussion questions, and simple games. According to the teacher, varying classroom activities prevented students from becoming bored and helped maintain their attention throughout the lesson.



Figure 4.16 The teacher asked the students to use QR Code for today lesson

The quantitative showed that QR Codes promoted greater student engagement, collaboration, and active participation during classroom learning. Students reported that they became more involved in discussions and classroom activities after using QR Codes. The interview findings provided a clear explanation for these results. The teacher regularly divided students into small groups, encouraged them to access learning materials through QR Codes, discuss the content

together, and present their ideas to the class. These collaborative activities created more opportunities for students to communicate, exchange opinions, and participate actively in the learning process.



Figure 4.17 The Student scan QR Code on the english book



Figure 4.18 The student listening the audio from QR Codes

The questionnaire indicated that students perceived QR Codes as easy to use and helpful for understanding learning materials. The interview findings supported this perception by showing that the teacher primarily used QR Codes to provide immediate access to listening materials and supplementary resources available in the English learning book. This allowed students to obtain learning

materials quickly without relying solely on printed explanations, making classroom instruction more practical and accessible.

Students reported that QR Codes improved learning efficiency and supported independent learning. The teacher explained that students were encouraged to scan QR Codes to search for information independently before discussing their findings with classmates. Although the teacher mainly acted as a facilitator during these activities, students were expected to construct their own understanding by exploring digital learning resources. This teaching strategy reflects the student-centered approach promoted by the Independent Curriculum.

The interview also provided additional information that was not identified in the questionnaire. While students generally expressed positive perceptions of QR Code implementation, the teacher highlighted several practical challenges, including limited internet connectivity and school regulations regarding smartphone use. The teacher addressed these challenges by selecting appropriate learning materials, gathering students' feedback after each lesson, and adjusting future learning activities according to classroom conditions. In addition, the teacher stated that no formal training on QR Code integration had been received and that most technological knowledge was developed independently through self-learning, webinars, and discussions with fellow teachers.

In conclusion, the findings from both research instruments complement one another. The questionnaire results demonstrated that QR Codes positively influenced students' learning experiences, while the interview findings explained the teaching strategies that contributed to these positive outcomes. Therefore, the integration of quantitative and qualitative findings provides a more comprehensive understanding of how QR Codes support English language learning in the Independent Curriculum. The results indicate that the effectiveness of QR Codes is influenced not only by the technology itself but also by the teacher's ability to design collaborative, engaging, and student-centered learning activities that maximize the use of digital learning resources.

B. Discussion

The discussion is organized into two sections. The first discussed the effects of integrating QR Codes into English learning books on students' classroom interaction based on the questionnaire findings. The second discussed the teaching strategies employed by the English teacher to integrate QR Codes into English language learning based on the interview findings.

1. The Integration of QR Codes in English Learning Books in the Independent Curriculum and Its Effect on Student Interaction in the Classroom

The first research question aimed to investigate how the integration of QR Codes into English learning books in the Independent Curriculum affects students' interaction in the classroom. Based on the questionnaire results, students showed overwhelmingly positive perceptions toward the use of QR Codes. The findings demonstrated that QR Codes increased students' learning interest, classroom engagement, ease of accessing learning materials, learning efficiency, and flexibility in obtaining information independently. These findings indicate that QR Codes function not only as technological tools but also as learning media that support more interactive and student-centered learning.

The important finding was related to students' learning interest and motivation. Most students agreed that QR Codes made English

learning more enjoyable, increased their interest in learning English, motivated them to participate actively, and attracted their attention during classroom activities. These results suggest that integrating multimedia resources through QR Codes creates a more interesting learning environment than relying solely on printed textbooks.

These findings supported the Technology Acceptance Model (TAM) proposed by Davis (1989), which explains that users are more likely to accept and utilize a technology when they perceive it as useful and easy to use. In this study, students perceived QR Codes as beneficial because they provided immediate access to audio materials and supplementary learning resources that enhanced their learning experiences. As a result, students demonstrated higher motivation and greater willingness to participate in English learning activities.

The findings are also consistent with the study conducted by Tan and Chee (2021), who found that the implementation of QR Codes significantly increased students motivation and enthusiasm for learning English pronunciation. Similarly, Izza (2024) reported that QR Codes integrated into English textbooks improved students' listening and speaking skills because learners could repeatedly access authentic audio materials independently. In the present study, students also expressed positive perceptions toward QR Code integration because the technology enabled them to experience more enjoyable and meaningful learning activities.

Another finding concerns students classroom engagement. The questionnaire results revealed that students became more focused during learning activities, participated more actively in classroom discussions, and collaborated more frequently with their classmates after using QR Codes. These findings indicate that QR Codes encourage active learning rather than passive knowledge reception. This finding aligned with the social constructivist theory proposed by Vygotsky (1978), which emphasizes that learning occurs through social interaction and collaboration. QR Codes provided opportunities for students to access learning materials together, exchange ideas, discuss answers, and solve learning tasks collaboratively. Consequently, students were actively involved in constructing knowledge through interaction with their peers rather than depending entirely on teacher explanations.

Furthermore, Brookfield (2012) argues that structured classroom discussion promotes critical thinking because students actively analyze information, express opinions, and evaluate different perspectives. The integration of QR Codes supports this process by providing authentic learning materials that become the basis for classroom discussions. Therefore, the technology does not simply deliver information but also stimulates communication and collaborative learning among students.

The third finding relates to the ease of use of QR Codes. Nearly all students agreed that QR Codes made English learning materials easier to access and understand. Students also preferred QR Code based learning over conventional learning methods. These findings reinforce the concept of perceived ease of use described by Davis (1989). When students experience minimal difficulty in operating a technology, they are more willing to adopt it as part of their learning activities. The simple scanning process enables students to access digital resources quickly without searching manually, making learning more practical and convenient.

These findings are further supported by Yao, et al (2022), who explain that one of the major advantages of QR Codes is their ability to provide instant access to digital information through a quick scanning process. Likewise, Dhiway (2024) states that QR Codes simplify the distribution of digital learning resources because learners can immediately access videos, audio recordings, websites, or learning documents using mobile devices. The present findings indicate that these characteristics contributed to students positive perceptions of QR Code implementation in English learning.

The findings also demonstrated that QR Codes improved learning efficiency. Students reported that they could obtain learning materials more quickly and save time during classroom activities. Rather than searching for learning resources independently, students

only needed to scan the QR Code provided in the textbook. This finding supports the practical function of QR Codes as digital shortcuts that reduce the time required to access educational resources. According to Yao et al. (2022), QR Codes increase efficiency because they eliminate unnecessary navigation processes and provide direct access to learning materials. This advantage is particularly relevant to the Independent Curriculum, which emphasizes flexible learning supported by digital technology (Putri, 2024). Therefore, QR Codes can assist both teachers and students in utilizing classroom time more effectively.

The final finding concerns flexibility in accessing information and developing students' English language skills. Most students agreed that QR Codes supported independent learning, increased their confidence in speaking English, encouraged them to read and listen to English materials more frequently, and contributed to improving their overall English skills.

These findings are consistent with the objectives of the Independent Curriculum, which encourages students to become autonomous learners who actively construct knowledge through various learning resources (Fuadi et al., 2024). By providing flexible access to digital content anytime and anywhere, QR Codes enable students to continue learning beyond classroom instruction. This flexibility encourages students to take greater responsibility for their

own learning process while simultaneously developing their language skills through repeated exposure to authentic English materials.

The findings also support Hirju and Georgescu (2023), who argue that smart learning technologies promote lifelong learning by allowing learners to access educational resources according to their individual needs and learning pace. Similarly, Kandiri et al. (2025) found that QR Code based learning modules increased students' learning motivation because students could independently access learning materials whenever necessary.

Overall, the questionnaire findings indicate that integrating QR Codes into English learning books positively influences students classroom interaction within the Independent Curriculum. The technology not only increases students motivation and participation but also facilitates collaborative learning, improves learning efficiency, simplifies access to educational resources, and promotes autonomous learning. These findings demonstrate that the successful integration of QR Codes extends beyond the technological features themselves. Instead, QR Codes become effective learning tools when they are integrated into classroom activities that actively engage students in the learning process and support the student-centered principles of the Independent Curriculum.

2. Teaching Strategies Designed by Teachers to Integrate QR Codes into English Language Learning in the Independent Curriculum

The second research question aimed to identify the teaching strategies designed by the teacher to integrate QR Codes into English language learning in the Independent Curriculum. Based on the interview findings, the teacher implemented QR Codes through several instructional strategies, namely collaborative learning, problem-based learning, flexible and engaging learning activities, reflection and feedback, and continuous professional development. These strategies demonstrate that the integration of QR Codes is not merely about using digital technology but also about designing meaningful learning experiences that encourage students to participate actively in the learning process.

One of the main strategies implemented by the teacher was collaborative learning. The teacher divided students into small groups and asked them to scan QR Codes to access audio recordings or reading materials before discussing the content together. Students were encouraged to identify the main ideas, unfamiliar vocabulary, and important expressions before presenting their findings to the whole class. This strategy shifted the learning process from teacher-centered instruction to collaborative knowledge construction among students.

This finding supported the theory proposed by Vygotsky (1978), who argues that knowledge is constructed through social interaction. Students develop their understanding more effectively when they collaborate with peers and receive support from teachers during the learning process. Through QR Code-based group discussions, students were provided with opportunities to exchange ideas, negotiate meaning, and solve learning tasks together. These activities illustrate the implementation of collaborative learning promoted in the Independent Curriculum. Similarly, Wenger (1998) explains that learning occurs through participation in communities of practice where individuals construct knowledge by interacting with others. The teacher's strategy of organizing students into discussion groups reflects this concept because students learned not only from the teacher but also from peer interaction. Consequently, QR Codes functioned as tools that facilitated collaborative learning rather than merely providing access to digital content.

Another important teaching strategy identified in the interview was the implementation of activities resembling Problem-Based Learning (PBL). Although the teacher did not explicitly identify the lessons as PBL, students were frequently presented with situations or problems related to the lesson before being instructed to scan QR Codes to obtain relevant information. After collecting information from the digital resources, students discussed possible solutions and

presented their conclusions to the class, while the teacher acted mainly as a facilitator.

These findings are consistent with Husaeni (2023), who explains that QR Code based learning can effectively support Problem-Based Learning because it enables students to access relevant information quickly during the problem-solving process. Rather than receiving direct explanations from teachers, students become active investigators who explore learning resources independently before constructing their own understanding.

The teacher's role during these activities also reflects the principles of the Independent Curriculum. According to Mirnayanti (2024), one characteristic of the Independent Curriculum is the shift in teachers' roles from knowledge transmitters to facilitators who guide students in developing critical thinking, creativity, communication, and collaboration. In this study, the teacher provided learning guidance whenever students encountered difficulties but allowed them to discuss, analyze, and present their own ideas independently.

The interview revealed that the teacher intentionally designed flexible and engaging classroom activities to maintain students motivation throughout the lesson. Instead of repeating identical learning procedures in every meeting, the teacher varied instructional activities by asking students to listen to audio recordings, complete

worksheets, answer discussion questions, and occasionally participate in simple educational games after scanning QR Codes.

This strategy aligned with the principles of the Independent Curriculum, which encourages teachers to develop flexible learning experiences according to students' needs and classroom contexts (Putri, 2024). Rather than relying solely on printed textbooks, QR Codes allowed the teacher to integrate multimedia resources that enriched students' learning experiences. These findings also support Musa and Nurhayati (2025), who argue that successful implementation of the Independent Curriculum requires teachers to utilize digital technology creatively while adapting learning activities to students' characteristics.

Moreover, varying classroom activities can increase students' motivation and attention during learning. As Brookfield (2012) explains, engaging learning environments encourage students to participate actively because they are provided with meaningful opportunities to think critically, communicate, and interact with others. The interview findings demonstrate that QR Codes served as instructional tools that enabled teachers to create more dynamic and student-centered classroom environments.

Reflection and feedback also emerged as important components of the teacher's instructional strategy. After implementing QR Code based activities, the teacher usually asked students whether

the QR Codes were easy to use, whether the materials helped them understand the lesson, and what difficulties they experienced during the learning process. Students responses were then used to improve subsequent learning activities.

This practice reflects Schon's (1983) concept of the reflective practitioner, which emphasizes that effective teachers continuously evaluate their instructional practices through reflection. Rather than considering each lesson as a fixed procedure, reflective teachers analyze classroom experiences and make improvements based on students' responses. In this study, the teacher adjusted learning materials whenever students experienced technical problems such as poor internet connectivity or difficulties accessing QR Code resources. Such reflective practices contributed to continuous improvement in classroom instruction.

Another finding concerns the challenges encountered during QR Code implementation. The teacher explained that smartphone restrictions in school sometimes limited students opportunities to use QR Codes during regular classroom activities. In addition, unstable internet connections occasionally affected students access to digital learning materials. However , instead of abandoning the technology, the teacher adapted learning activities by selecting appropriate materials and scheduling QR Code use during lessons requiring digital resources, particularly listening activities.

These findings indicated that successful technology integration depends not only on technological availability but also on teachers' flexibility in adapting instructional strategies to existing classroom conditions. This observation is consistent with Mirnayanti (2024), who states that one of the main challenges in implementing the Independent Curriculum is teachers' ability to adjust innovative learning strategies according to school facilities and students learning needs.

Finally, the interview revealed that the teacher had never received formal training specifically related to QR Code integration in English language teaching. Most knowledge regarding QR Code implementation was obtained independently through self learning, internet resources, webinars, and professional discussions with fellow teachers. Despite the absence of formal professional development, the teacher successfully integrated QR Codes into classroom instruction by continuously exploring new teaching ideas and adapting them to students characteristics.

This finding supports Wenger's (1998) concept of professional learning communities, which emphasizes that teachers develop professional competence through collaboration and the sharing of experiences with colleagues. It also supports Musa and Nurhayati (2025), who argue that continuous professional development is essential for teachers implementing the Independent Curriculum because educational technology and students' learning needs continue to evolve.

In conclusion, the interview findings demonstrate that the successful integration of QR Codes depends largely on teachers pedagogical strategies rather than on the technology itself. QR Codes become meaningful learning tools when teachers design collaborative activities, encourage inquiry and problem-solving, provide opportunities for reflection, and continuously adapt instructional practices to students' needs. These strategies are consistent with the student centered philosophy of the Independent Curriculum, which emphasizes active participation, independent learning, collaboration, and the effective use of digital technology to improve learning quality.

This study employed an explanatory sequential mixed methods design in which quantitative data were collected and analyzed first, followed by qualitative data to explain and strengthen the quantitative findings. According to Creswell (2018), the primary purpose of this research design is to use qualitative findings to provide a deeper

explanation of quantitative results. Therefore, the integration of questionnaire and interview data enables researchers to obtain a more comprehensive understanding of the implementation of QR Codes in English learning within the Independent Curriculum.

The quantitative findings revealed that students had highly positive perceptions of the integration of QR Codes into English learning books. Most students agreed that QR Codes increased their learning interest, motivation, classroom participation, collaboration, learning efficiency, ease of accessing materials, independent learning, and English language skills. These findings indicate that QR Codes positively influence students classroom interaction and learning experiences. However, the questionnaire alone could not fully explain why students perceived QR Codes positively or how teachers implemented them effectively in classroom practice.

The interview findings complemented these quantitative results by explaining the instructional strategies employed by the teacher during QR Code integration. The teacher designed collaborative learning activities by organizing students into small discussion groups where they accessed digital materials through QR Codes before exchanging ideas and presenting their findings. This strategy provides a clear explanation for the questionnaire findings showing that students became more active, collaborative, and engaged during classroom learning. In other words, students increased participation was influenced not only by the presence of QR Codes but also

by the teacher's pedagogical approach in organizing collaborative learning activities.

Similarly, the questionnaire results demonstrated that QR Codes increased students' learning motivation and interest in English. The interview findings further explained that the teacher intentionally varied classroom activities by combining QR Codes with listening exercises, worksheets, classroom discussions, and educational games. Rather than repeating identical teaching procedures in every lesson, the teacher designed flexible learning experiences to maintain students' attention and enthusiasm. These instructional strategies explain why students perceived English learning as more enjoyable after the integration of QR Codes.

Relationship between the quantitative and qualitative findings concerns students' independent learning. The questionnaire results indicated that students felt more capable of learning independently and accessing learning resources without relying entirely on the teacher. This finding was reinforced by the interview results, which showed that the teacher frequently encouraged students to scan QR Codes, search for information independently, discuss their findings with peers, and present their own conclusions before receiving feedback from the teacher. Consequently, QR Codes functioned not only as technological tools but also as media that encouraged learner autonomy, which is one of the primary goals of the Independent Curriculum.

The integration of both also provides a broader understanding of learning effectiveness. While the questionnaire highlighted students positive perceptions, the interview identified several practical challenges that were not captured by the questionnaire. The teacher explained that smartphone restrictions at school and unstable internet connections occasionally limited the implementation of QR Code based learning activities. In addition, the teacher acknowledged that no formal training regarding QR Code integration had been provided, requiring independent learning through webinars, internet resources, and collaboration with fellow teachers. These findings indicate that the successful implementation of educational technology depends not only on students acceptance but also on teachers professional competence, school policies, and the availability of technological infrastructure.

The integrated findings also reflect the characteristics of the Independent Curriculum. According to Putri (2024) and Fuadi et al. (2024), the Independent Curriculum emphasizes student centered learning, flexibility, collaboration, critical thinking, and the meaningful integration of technology into classroom instruction. The quantitative findings demonstrated that students experienced these characteristics through increased participation, collaboration, independent learning, and language skill development. Meanwhile, the qualitative findings explained that these outcomes were achieved because the teacher deliberately designed collaborative activities, implemented inquiry-oriented learning, encouraged classroom reflection, and continuously adapted instructional strategies according to students' learning

needs.

Based on the integrated findings, it can be concluded that the integration of QR Codes into English learning books positively influences students' classroom interaction by increasing motivation, engagement, collaboration, learning efficiency, independent learning, and English language development. Furthermore, these positive outcomes are supported by teachers instructional strategies, including collaborative learning, problem-based learning, flexible learning activities, continuous reflection, and ongoing professional development. Consequently, QR Code integration can be considered an effective strategy for supporting the implementation of the Independent Curriculum because it combines digital technology with student-centered pedagogy to create meaningful English language learning experiences.