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The Implementation of Differentiated Instruction and Adaptive Assessment in Improving English Reading Comprehension in an Efl University Context

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A B S T R A C T

This study investigates the implementation of differentiated instruction and adaptive assessment in improving the reading comprehension of university students in an English as a Foreign Language (EFL) environment. Both approaches have been recognised widely for their pedagogical benefits, but they are rarely employed simultaneously, which is a missed opportunity for a more holistic approach to instructional design. Moreover, there is a lack of study on the implementation of adaptive evaluation in different EFL reading teaching. To overcome this gap, an eight-session mixed-methods intervention was administered to 20 first-semester university students enrolled in an intensive reading course. The quantitative data were analysed using t-tests and Rasch modelling and the qualitative data were collected using classroom observations and semi-structured interviews. Results showed statistically significant gains in reading comprehension. Rasch analysis further evidence of consistent levels of learner competency and meaningful development among participants. Furthermore, the students found the adaptive assessments fair and transparent, which increased their engagement and awareness of their learning progress. Overall, the findings suggest that the use of differentiated instruction and Rasch-based adaptive assessment is an effective way to support reading development by aligning instructional delivery and assessment practices to learners' needs.

Keywords: *Differentiated Instruction, Adaptive Assessement, EFL Learners, Rasch Model, Reading Comprehension*

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INTRODUCTION

The importance of English as an international language of communication is increasing rapidly worldwide, particularly in education (Cho et al., 2021) as well as science and technology Crystal (2003). In response to the issue, the creation of adaptive teaching approaches that match the demands of students becomes critical (Tauchid et al., 2022). Of the four basic language abilities, reading is one of the most important for EFL learners since it directly impacts their overall communicative proficiency (Anderson, 2003). However, reading comprehension is one of the most complicated human cognitive processes and is thus difficult to teach and assess properly (Elleman & Oslund, 2019). Given this cognitive complexity and the growing diversity within classrooms, teachers can no longer rely on one unchanging, all-purpose teaching style. Alternatively, education must be adapted to learners' readiness, interests and profiles (Tomlinson et al., 2005). Schwab (2020) found that inclusive practices such as dynamic grouping and tailored evaluations promote access to the classroom and student involvement. This approach represents the foundation of differentiated education, which substantially attempts to align the content, process, and product of learning to accommodate the diversity of student profiles (Tomlinson, 2001).

Alongside this paradigm shift, the rapid development of technology also revolutionises the conventional learning patterns by opening up opportunities for the use of a

more personal and adaptive approach (Tang et al., 2020). The adaptive assessment system is considered to be an embodiment of the integration of this technology to produce more accurate, fair and meaningful evaluation outputs on the diversity of learners' ability levels Ebenbeck and Gebhardt (2022). In this regard, the Rasch model was identified as a very effective measurement instrument to facilitate such adaptive testing system (Kostikov et al., 2023)). In addition, the Rasch model-based Item Response Theory (IRT) algorithm can be used to calibrate the test items for adequate assessment of students' achievement (Kostikov et al., 2023). Empirical evidence also confirms that the conversion of data into the logit scale in Rasch modelling, which maps student ability by grade level, can yield measurement results with a high degree of accuracy (Soeharto & Csapó, 2022).

The research is grounded on the integration of Differentiated Instruction Theory (Tomlinson, 2001) and Adaptive Assessment Theory (Bennett, 2017). These frameworks indicate that EFL learners have different needs and hence need flexible teaching and careful assessment. All the above research constantly underline the importance of these strategies individually. For instance, Tomlinson (2001) describes the important role of differentiation in addressing the unique features of students. Similarly Gheyssens et al., (2020)) pointed out its usefulness as an educational philosophy, while Schwab (2020) highlighted the benefits of making classrooms more accessible and engaging for students. The benefits of adaptive assessment are also widely documented. Therefore, adaptive assessments develop shorter, dynamically adapted examinations (Ihichr et al., 2024),), improve overall learning quality (Utomo et al., 2025) and successfully meet unique student preferences (Adeoye et al., 2025).

Nevertheless, differentiated instruction and adaptive evaluation are generally presented as separate techniques in the existing literature. There is a numerous gap in our understanding of how to combine these two approaches to create a holistic learning environment that dynamically adjusts both materials and assessments to student progress.

To address this limitation, this study analyzes the combineded effect of differentiated instruction and adaptive assessment on improving students' intensive English reading comprehension in an EFL university context. Specifically, the study intends to answer three major questions: Does the implementation of differentiated instruction improve students' English reading comprehension in an EFL university context?. How effective is the implementation of adaptive assessment in providing fair and accurate evaluation of students' intensive reading achievement?. And what is the impact of the implementation of differentiated instruction and adaptive assessment on students' motivation and engagement in intensive reading?

The Overview of Differentiated Learning

Differentiated instruction involves a dapting the content and activities to the diversity of students' backgrounds and learning styles. Studies indicate that differentiated instruction can significantly improve students' engagement and academic performance once applied to reading. Gheyssens et al. (2020) emphasize that teachers who tailor their lessons to Students' profiles, interests, and readiness are more likely to foster motivation and participation. In inclusive classrooms, differentiation is also viewed as a central tool for addressing student diversity, allowing those with and without special needs to engage in meaningful learning activities (Schwab, 2020). It offers adequate resources to struggling learners and more challenging tasks to advanced readers, thus promoting confidence, inclusion, and independence. Also, text features such as complexity, word frequency and emotional tone have specific impacts on the comprehension of students with varying competence levels. The need for adapting reading texts to the learners' capabilities is stressed.

The Overview of Adaptive Assessment

Unless convensional assessments, adaptive assessments adjust the complexity of the questions based on the student's responses. One of the latest adaptive assessment methods is Computerized Adaptive Testing (CAT) that adapts the difficulty level of questions based on

students' responses, making the test more precise, fair, and motivating than previous assessments. CAT improves assessment efficiency and offers personalized learning by targeting every student's weaknesses and needs. In this context, the Rasch model is a powerful instrument to measure the difficulty of items and the ability of students on the same. Hence, Rasch-based tests shorten the testing duration, providing time savings without compromising the validity and precision of measurements . In general, adaptive evaluation results in accurate as well as personalised feedback, it assures fairness and improves students' confidence in EFL intensive reading classrooms.

The Concept of Intensive Reading

The concept of intensive reading refers to a focused and systematic approach to reading that aims to achieve a detailed and precise understanding of a text. It is often conducted with short passages and under the guidance of the teacher, emphasizing the improvement of English reading comprehension abilities, linguistic knowledge, and analytical thinking. Reading, as described by Sahibzada et al. (2024) is fundamental in EFL learning since it fosters comprehension, vocabulary growth, and critical engagement with language.

Building on this view, subsequent research emphasizes that the use of reading approaches plays a crucial role in improving learners' English reading comprehension outcomes, helping them become more strategic and proficient readers in academic settings (Yapp et al., 2023). English reading comprehension is a complex process of decoding and meaning construction. Thus, it is important to employ many instructional approaches. Differentiated instruction, which caters to the specific strengths and limitations of pupils, in particular, has a tremendous potential to effectively facilitate and improve overall reading comprehension performance (Silva-Maceda & Camarillo-Salazar, 2021).

The Implementation of Differentiated Instruction in Reading

Differentiated Instruction (DI) is one of the ways to develop inclusive classrooms by the educators (Achmad et al., 2024). In DI, the educators adjust content, method, product, and learning profiles to fit the preparedness of their students (Carol Ann Tomlinson, 2001). Changing text difficulty has a considerable effect on comprehension (Pickren et al., 2021), which allows teachers to target certain challenges in an effective manner (Silva-Maceda & Camarillo-Salazar, 2021). In addition, classifying children based on their individual interests increases engagement (Goyibova et al., 2025). Differentiated instruction calls for greater teacher skill and creativity (Jager et al., 2022), but overcoming the initial implementation challenges greatly enhances students' reading development (Achmad et al., 2024). In summary, differentiated instruction is essential for providing high quality, personalized education for every child (Langelaan et al., 2024).

The Use of Rasch Model for Addaptive Assessment

Adaptative assessment is a critical tool for systematically following students' development (Md Din et al., 2023) by dynamically modifying the structure and complexity of questions (A. A. Kostikov et al., 2022), an important step forward in education (Adeoye et al., 2025). To be effective you must be able to reliably measure both student competence and item difficulty. This is expected by the Rasch model in Item Response Theory (IRT) that places both measurements on one scale (Hope et al., 2024; Ihichr et al., 2024; von Davier, 2017). The research showed that rasch-based IRT guarantees the fairness and effectiveness of evaluation and adaptive auto-scoring (A. A. Kostikov et al., 2022). It even finds deeper learning aspects (Anggia & Habók, 2024) therefore it is suitable for accurate, objective testing.

METHOD

The study adopted a mixed-methods design with a pre-test and post-test strategy to evaluate the effect of differentiated instruction and adaptive assessment on students' intensive reading skills. The quantitative data were collected by reading tests and adaptive assessments to measure students' reading proficiency. The qualitative data were collected by observations and semi-structured interviews to capture students' perceptions and experiences. According to the research of Creswell & Inoue (2025), the quantitative and qualitative data can reflect different types of evidence. When combined in mixed methods research, these two forms of data provide a more comprehensive insight by using both numerical information and participants' experiences to obtain a more comprehensive understanding of the research issue.

As reported by the research Fàbregues (2022) The results suggest that researchers are increasingly able to give clear reasons for choosing a mixed methods approach, explain how their study is structured, and show how numerical and descriptive data are combined within their research.

Participants

The selection of participants was purposive sampling method. Data was collected through in-depth interviews with explicit instructions to ensure participants completely understood the goal and provided honest and comprehensive answers. The fundamental rationale for the use of this sampling approach is to obtain a tighter match between the sample and the research objectives, so improving the accuracy of the study and enhancing the trustworthiness of the data and the findings (John W Creswell & Creswell, 2018). The target population consisted within of first semester students who registered in English Language Education program of Universitas Bandar Lampung. The intended participants were 2025 cohort freshmen enrolled in intense reading courses.

The final sample included 20 students within the typical freshman age range of approximately 18 to 19 years old, selected based on their diverse reading skills and learning needs (Willie, 2024), and they were suitable to explore the effects of differentiated instruction and adaptive assessment. This study was performed in strict ethical procedures. The goal and methods of the research were explained to the participants and free consent was obtained before the research started. The researcher ensured that their cooperation would not affect their future academic career. The identity of the participants was kept anonymous during the study.

Instruments

In this study, a number of complementary devices were used in order to obtain both quantitative and qualitative data. Pretests and post-tests were used to examine students' reading abilities before and after the intervention, concentrating on intense reading skills such as locating information, identifying main ideas, making inferences, and evaluating arguments (Capili & Anastasi, 2024). The pretest also determined students' skill levels (lower, medium, and advanced) to assist in matching differentiated instruction to students' readiness. All test items were examined with the Rasch modelling to convert the data into logit forms, to ensure the accurateness and reliability of the data (Soeharto & Csapó, 2022). This provides a valid assessment of students' ability levels and is in line with the concepts of adaptive assessment. The adaptive assessment employed in this study enables the ongoing measurement of the students' reading abilities throughout the intervention. The findings were assessed using Rasch parameters and Item Response Theory (IRT) to arrange students into three readiness levels, ensuring that each student got an adequate amount of challenge and fair evaluation (A. Kostikov et al., 2023).

Classroom dynamics and the execution of teaching tactics were captured through observations during the intervention. The observations recorded the use of differentiated instruction and adaptive evaluations such as groupings of students, modes of interaction and presence in sessions (Cronbach, 1971; Porter, 2003).

Additionally, selected students were interviewed via semi-structured interviews to explore their perceptions, motivation, engagement, and obstacles during the intervention. The interviews were a good source of qualitative insights that supplemented the quantitative results and helped to understand the impact of the combination of differentiated instruction and adaptive assessment on students' reading development and learning experiences (Kallio et al., 2016; Ruslin, 2022).

Intervention

The intervention was carried out in eight scheduled sessions. The first session was on diagnostic assessment and student grouping by pretest scores, which were assessed using Rasch modeling. The students were divided into three levels of proficiency: lower (B1), medium (B2), and advanced (C1). This classification served as the basis for differentiated instruction over the whole intervention. The second session was dedicated to teaching reading methods, including skimming and scanning, to build students' basic reading comprehension skills. The third session consisted of the first formative test after the first intervention. The assessment was created to evaluate early growth in differentiated instruction and reading strategies after they were introduced, and it was customized to the students' proficiency levels.

The fourth session was introduced with new reading materials where more emphasis was given to the development of comprehension. The fifth session was followed by another formative test to assess students' continued progress. This teaching and evaluation method enabled the monitoring of students' reading development across levels to continue. The sixth session focused on the central reading ability of identifying the primary theme. The teacher also provided motivational reinforcement and encouragement to students in the session to improve their engagement in learning and confidence in reading tasks. This kind of assistance was intended to increase students' persistence in reading more complex texts.

The third formative evaluation was implemented in the seventh session, using various reading texts to further examine the students' progress in comprehension abilities after the last cycle of training. The session also served to confirm the constancy of students' reading progress across levels of proficiency.

Finally, the posttest was administered in the eighth session. The posttest was the same as the pretest in terms of structure and format. The students were asked to reflect on their learning experiences during the intervention so that the researcher could assess both their reading improvement and their engagement throughout the eight-session program.

Data Collection

Before gathering the data, the researcher received a formal permission from the head of the English Language Education Department to conduct the research in the department. This study used an mixed methods to gather quantitative and qualitative data. A pretest at the beginning of the semester will determine the students' original level of English reading comprehension. Following this, an eight-session intervention involving differentiated instruction (DI) and adaptive assessment (AA) will be implemented to address students' diverse learning needs. In the end, the improvement in reading proficiency will be measured using a posttest.

In addition to the examinations, students' perceptions of fairness, engagement and motivation during the learning process will be collected by conducting interviews. An observation checklist will be used to ensure DI and AA procedures are applied consistently. The pretest will provide a baseline score, and the posttest will measure change in reading skills. Follow up interviews will also help bring light on the experiences of the students and provide a comprehensive assessment of the academic achievement and personal perspectives on the intervention.

Data Analysis

Quantitative Analysis

To compare pretest and post-test scores, a paired-sample T-test will be conducted to find out whether there is a significant improvement in English reading comprehension. Data normality will be checked, and slight deviations will not affect the results (Ghasemi & Zahediasl, 2012). Additionally, Rasch Model Analysis will be applied to calibrate test items and provide detailed insights into item difficulty and student proficiency, ensuring valid and fair assessment results.

Qualitative Analysis

Interview transcriptions and observation notes, will be analysed using thematic analysis, in particular with regard to perceptions of fairness, engagement and experiences with the intervention. The interviews will consist of five questions derived from Gibson & Pick (2000) to explore the influence of differentiated instruction and adaptive assessment on their learning experiences.

FINDINGS AND DISCUSSION

Overview of the Chapter

This chapter offerings the research outcomes on the effects of the implementation of differentiated instruction and adaptive assessment on students' English reading comprehension using a mixed-methods approach. SPSS and Rasch analysis were used to analyze quantitative data from pretest and posttest scores, while qualitative data from classroom observations and semi-structured interviews conducted thematic analysis. The findings are presented through quantitative results, qualitative insights, and an integrated discussion to explain students' intensive reading development.

Quantitative Findings

The reading assessments comprised 50 items administered before, during, and after the intervention. Quantitative analyses included Rasch modeling, reliability and normality tests, and pretest–posttest comparisons using SPSS. Data from 19 of the 20 participants with complete records were analysed using a paired-sample t-test to analyze the difference between pre-test and post-test results.

Rasch Model Analysis of Students' Intensive Reading Ability

The 50-item English reading test was analyzed by Rasch model. The correct answer was awarded one point, and the incorrect or blank answer was rated as zero points. The resulting Item-Person Wright Map is shown in Figure 1, with student ability and item difficulty plotted on a common logit scale from 4 to -1. On this scale, the greater the number, the better the reading skills or the harder the questions.

These logit scores changed student proficiency. Scores greater than 1 showed a student was transferred to a higher level. Scores between 0 and 1 meant no change. A fall to 1 or less indicated a lower level of proficiency, a regulation that also applied to those who were absent. Questions were classified into three categories of difficulty: high (> 2.0), medium (−2.0 to 2.0), and low (< −2.0). The 'T' symbol is the standard deviation. Anything below that is either a student with very low reading ability or a question that is just too easy.

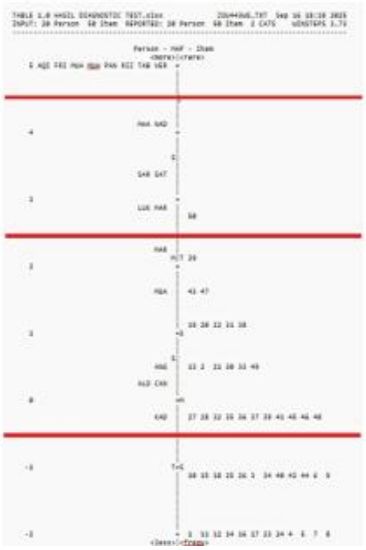

Figure 1 Item Map of the Diagnostic Test

Figure 1, the Item Person Wright Map represents the distribution of students' reading proficiency on the left and the difficulty levels of test items on the right. The map categorizes both student performance and item difficulty into three general levels: high, medium, and low. For students, these levels represent their English reading comprehension ability, while for the items they reflect the degree of challenge posed by each question. Regarding item difficulty, the Wright Map shows that all test items are located above the distribution of students' reading abilities. Most items fall within 0 to +2 logits, slightly above the students' starting abilities, while Item 50 stands out as the most challenging at +3 logits. Items below –1 logits (1, 3, 4, 5,6 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 23, 24, 25, 26, 34, 40, and 44) are very easy and offer little differentiation.

Students are grouped by logit ranges: low level (0–2 logits: KAD, ALD, CAN, ANG, MGA, MARS), medium level (3–4 logits: LUK, MAR, SAR, SAT, MHA, NAD), and advanced level (~5 logits: AQI, FRI, RIZ, MUHFA, MUHFI, PAN, TAB, VER), showing a wide range of initial reading proficiency.

Table 1. Student Ability Level of Pretest

No.	Lower level	Medium level	Advanced level
1.	KAD	LUK	VER
2.	ALD	MAR	TAB
3.	CAN	SAR	RIZ
4.	ANG	SAT	PAN
5.	MGA	MHA	MUHFA
6	MARS	NAD	MUHFI
7.		-	FRI
8.	-	-	AQI

This distribution indicates that the participants demonstrate a wide range of English reading comprehension levels, from low to advanced.

Reading Test in the 3rd Intervention

After each student's ability level was identified, the tests were adjusted to suit their reading competence. The reading materials were grouped by difficulty, with B1 for lower-level students, B2 for intermediate students, and C1 for advanced students. The tests were administered every two meetings to examine the impact of the intervention

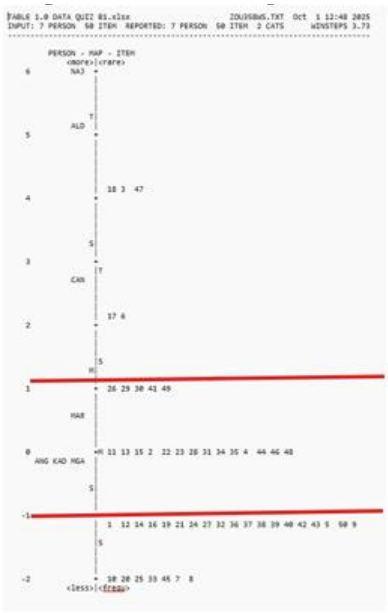

Figure 2 Item Map of Lower Group (B1)

Figure 2 B1 Reading abilities of students vs levels of item difficulty. None of the questions score 5 logits, which means that the test does not feature questions of high difficulty. The hardest questions are number 18, 3, and 47 with 4 logits. Most of the items are in the average range of between -1 and 1 logit. A substantial group of things (1, 5, 9, 12, 14, 16, 19, 21, 24, 27, 32, 36-40, 42, 43, and 50) are considered to be simple.

Student performance is separated into red lines. ANG, KAD, MGA and MARS are in the low-ability category whereas CAN is middle-level. ALD has great proficiency above 5 logits and NAJ has the highest ability level. In the next session NAJ, ALD and CAN moved into the intermediate proficiency group, in indication of advancement in their reading skills.

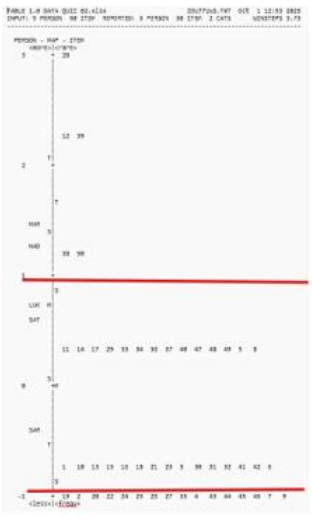

Figure 3 Item Map of Medium Group (B2)

Figure 3 all test items are below 3 logits, hence none of the test items are considered as particularly challenging (Figure 3 B2). The hardest question is number 28, but there is a wide set of questions that are quite easy (4, 7, 9, 19, 20, 22, 24-27, 35, 43-46). Based on the red markers, LUK, SAR, and SAT had the lowest reading ability, scoring between 0 and 1 logit. MAR and NAD are more proficient at scores > 1 logit. In the next session, MAR and NAD were moved to the advanced group. They made much progress in reading skills.

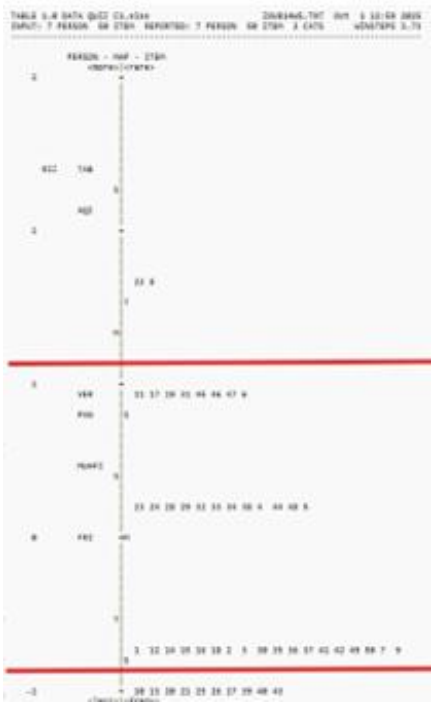

Figure 4 Item Map of Advanced Group (C1)

Figure 4 presents the advanced group. The most difficult items fall within 2–3 logits (items 22 and 8), while items 10, 13, 20, 21, 25, 26, 27, 39, 40, and 43 are relatively easy. No student is below 0 logit, indicating no decline in proficiency. VER, PAN, MUHFI, and FRI are positioned at 0–1 logit (medium within this high group), while RIZ, TAB, and AQI consistently perform at 2–3 logits (advanced). The Figure demonstrates that all students maintained or increased their positions, confirming stability and growth among high-level readers.

Table 2. Student Ability Level of 3rd Intervention

No.	Lower level	Medium level	Advanced level
1.	ANG	LUK	AQI
2.	KAD	SAT	FRI
3.	MGA	SAR	MUHFI
4.	MARS	NAJ	PAN
5.	MHA	ALD	RIZ
6	MUHFA	CAN	TAB
7.	-	-	MAR
8	-	-	NAD
9	-	-	VER

Table 2 reveals several shifts in students' proficiency over the assessment period. MHA and MUHFA were placed in the lower level because they were not in the test so they could not be placed based on logit scores. On the contrary, there were several participants who made positive progress: ALD, CAN and NAJ shifted from the lower level to the medium level, indicating measurable improvement in reading ability . Also, MAR and NAD shifted from the medium level to the advanced level, indicating significant growth . Overall, the table shows that most of the changes were upward, suggesting that the intervention was effective in improving students' reading performance rather than causing any decline.

Reading Test in the 5th Intervention

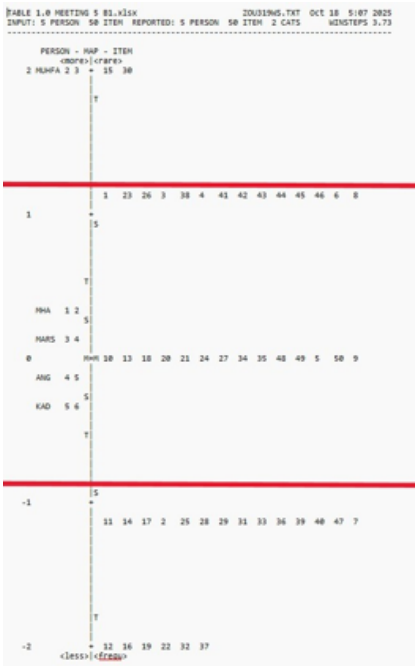

Figure 5 Item Map of Lower Group (B1)

Figure 5 illustrates the distribution of reading abilities in the lower level group. The most difficult items in this session were items 15 and 30, both at 2 logits, with most of the other items between 0 and 1 logits, a moderate difficulty. Items such as 2, 7, 11, 14, 17, 25, 28, 29, 31, 33, 36, 39, 40, and 47 were under –1 logits, rendering them relatively easy for the group. MUHFA scored over 2 logits, the highest ability in this group, whereas MHA, MARS, ANG and KAD scored between 0 and 1 logits, an intermediate performance. This suggests that MUHFA is likely to progress in the next session, whereas the others are expected to stay at the same level.

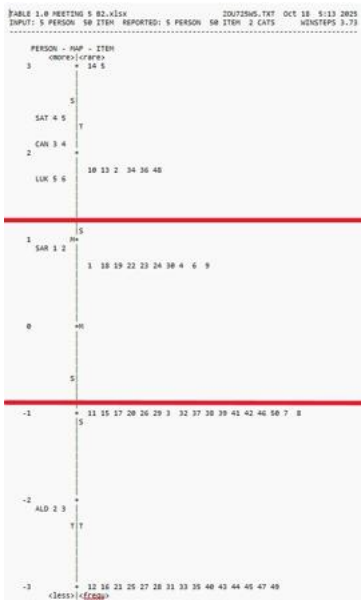

Figure 6 Item Map of Medium Group (B2)

Figure 6 presents the Wright Map for the medium-level group. Items 14 and 5, both at 3 logits, were the most challenging, while a set of items including 12, 16, 21, 25, 27, 28, 31, 33, 35, 40, 43, 44, 45, 47, and 49 fell below –2 logits, making them very easy. SAT, CAN, and LUK scored between 2 and 3 logits, the highest abilities in this group. SAR fell in the middle range and

ALD was below the lower threshold, the lowest level of reading ability. These distributions suggest that SAT, CAN and LUK would probably go to the advanced level, SAR would probably stay the same and ALD might go down to the lower level in the next session.

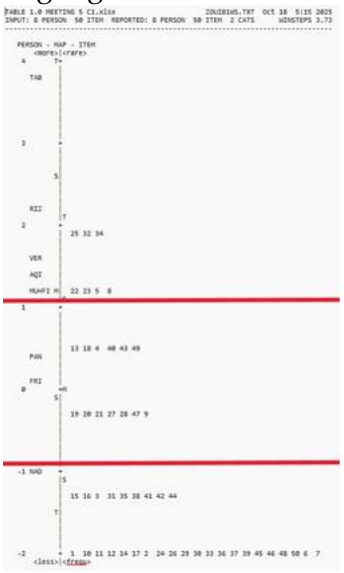

Figure 7 Item Map of Advanced Group (C1)

Figure 7 shows the advanced group. No item scored higher than 4 logits, indicating that the test was not very difficult for this group. Most items fell between 0 and 1 logits, with several items (1, 2, 6, 7, 10, 11, 12, 14, 17, 24, 26, 29, 30, 33, 36, 37, 39, 45, 46, 48, 50) at –1 logits, making them relatively easy. TAB had the highest score in this group. RIZ, VER, AQI and MUHFI scored between 1 and 2 logits (intermediate within the advanced group) while PAN and FRI were between 0 and 1 logits. NAD scored –1 logits indicating the lowest ability. Overall, the group shows clear variation, with only NAD at risk of declining to medium proficiency in the next session.

Table 3. Student Ability Level Of 5th Intervention

No.	Lower level	Medium level	Advanced level
1.	ANG	MUHFA	AQI
2.	KAD	NAD	FRI
3.	ALD	SAR	MUHFI
4.	MARS	-	PAN
5.	MHA	-	RIZ
6	NAJ	-	TAB
7.	MGA	-	CAN
8.	MAR	-	SAT
9.	-	-	VER
10.	-	-	LUK

Table 3 shows the numerical changes in student proficiency. MGA, NAJ and MAR were categorized as lower due to absence. ALD moved down from medium to lower level, MUHFA moved up from lower to medium level. NAD moved down from advanced to medium level, while CAN, SAT and LUK consistently moved up, showing continuous progress. Overall, most of the level changes were upward, suggesting that the intervention had effectively supported improvements in students' reading abilities rather than causing declines.

Reading Test in the 7th Intervention

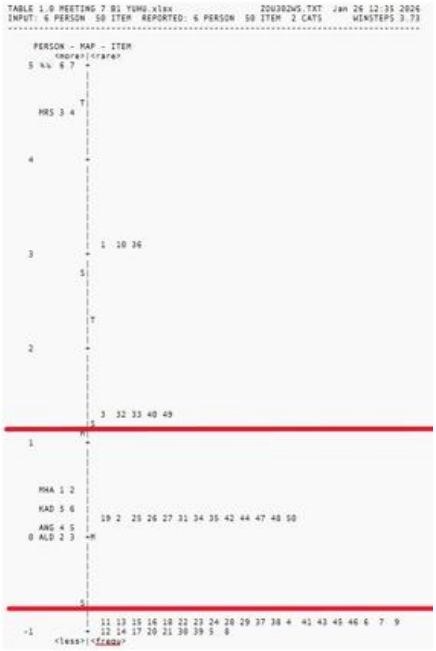

Figure 8 Item Map of Lower Group (B1)

Figure 8 illustrates the 7th intervention in the lower-level group had no highly difficult items over 4 logits. The most difficult items (1, 10, 36) scored approximately 3 logits, although majority of them scored between 0 and 1 logits, showing intermediate difficulty. On the other hand, a number of items (4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 28, 29, 37, 38, 39, 41, 43, 45, 46) were clustered at -1 logits, and therefore very simple. Student logit scores showed clear progression, with MARS scoring above 4 logs, which is an advanced level of competency and progressing to the medium level. MHA, KAD, ANG and ALD remained around 0 logit, indicating stable, moderate competence.

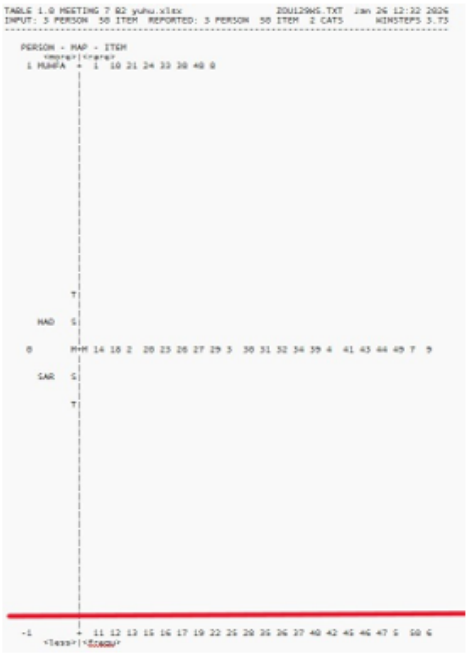

Figure 9 Item Map of Medium (B2)

Figure 9 depicts the medium-level group. The most difficult items (1, 10, 21, 24, 33, 38 and 48) were at 1 logit value and most other items were clustered around 0 logits indicating

moderate difficulty. Several items, such as 5, 6, 11, 12, 13, 15, 16, 17, 19, 22, 25, 28, 35, 36, 37, 40, 42, 45, 46, 47, and 50, were at –1 logits, representing easy items. Student logit distribution shows MUHFA at the top of the range, yet still below 2 logits, so no level shift occurred. NAD and SAR remained around 0 logits, indicating stable proficiency with no observed change during this session.

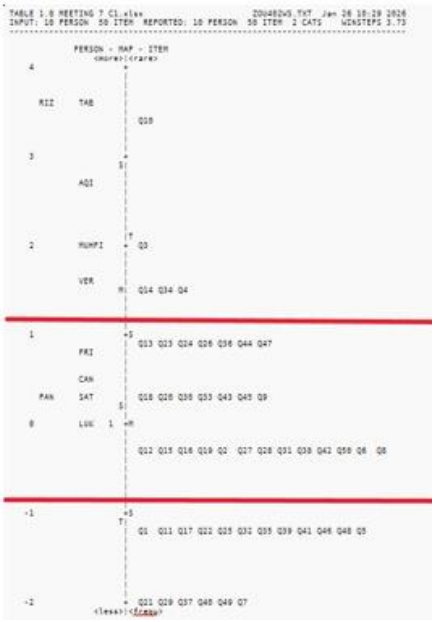

Figure 10 Item Map of Advanced (C1)

Figure 10 presents the advanced group, Q10 was the most difficult item, followed by Q3, Q4, Q14 and Q34 just above 1 logit. Most of the items fell in a moderate range (0 to 1 logit) with the easiest things clustering at -1 logit (Q1, Q5, Q11, Q17, Q22, Q25, Q32, Q35, Q39, Q41, Q46, Q48) or below. RIZ and TAB had the largest logits in relation to students' performance, AQI was heading towards the advanced level, while MUHFI and VER were stable. Finally, FRI, CAN, PAN, SAT and LUK showed a medium ability (0 to 1 logit) with no student scoring below –1 logit.

Table 4. Student Ability Level of 7th Intervention

No.	Lower level	Medium level	Advanced level
1.	ANG	MUHFA	AQI
2.	KAD	NAD	FRI
3.	ALD	SAR	MUHFI
4.	MHA	MARS	PAN
5.	NAJ	-	RIZ
6	MGA	-	TAB
7.	MAR	-	CAN
8.	-	-	SAT
9.	-	-	VER
10.	-	-	LUK

Table 4 provides the numeric summary of student level changes. NAJ, MAR, and MGA were classified as lower due to absence. MARS improved to the medium level, reflecting increased reading proficiency. Students MUHFA, NAD and SAR remained at medium, while the advanced-level students (AQI, FRI, MUHFI, PAN, RIZ, TAB, CAN, SAT, VER, LUK) maintained their stable logit positions. Additionally, CAN, SAT, and LUK moved up from

lower levels to the advanced group. In general, most of the changes were upward or stable indicating that the intervention was successful in promoting reading development without regression.

Summary of Statistical Results

This section reports the quantitative results. Pretest and posttest data from 19 participants were analyzed using SPSS, including normality testing. Although participant numbers varied across intervention sessions, all available data were included in the analysis. Test instrument reliability was examined via Cronbach's Alpha. Descriptive statistics summarized students' reading performance across the pretest, intervention phases (B1, B2, and C1), and posttest. Finally, a paired-sample t-test was performed to analyze the changes in reading performance after the intervention.

Tabel 5. Reliability, and Normality Test Results

Phase	N	Cronbach's Alpha	(Sig.)	Shapiro-wilk Statistic
Pretest	19	0.893	0.415	0.951
Posttest	19	0.944	0.000	0.677

As shown in Table 5, the internal reliability of the pretest was high (Cronbach's Alpha = 0.893), which confirmed the reliability of the instrument to measure students' initial intensive reading ability. The Shapiro–Wilk test produced a significance value of 0.415, which was greater than 0.05, indicating that the pretest data were normally distributed. A significance greater than 0.05 indicates that the data do not significantly vary from a normal distribution (Ghasemi & Zahediasl, 2012).

Posttest Cronbach's Alpha increased to 0.944, indicating a very high level of internal consistency and confirming that the items measured reading performance reliably following the intervention. The Shapiro–Wilk test, however, produced a significance value of 0.000, indicating non-normality of the posttest data. Despite the small sample size and deviation from normality, a paired-samples t-test was applied, which is generally robust under such conditions, though results should be interpreted cautiously in light of the sample limitations (Martha et al., 2002).

Table 6. Descriptive Statistics, and Reliability Across Phases

Phase	Level	N	Cronbach's Alpha	Min	Max	Mean	SD
Pretest	-	20	0.89	0.15	0.95	29.35	9.24
1 Intervention	B1	7	0.93	0.28	0.85	30.85	9.77
	B2	5	0.65	0.20	0.40	21.60	4.72
	C1	7	0.81	0.42	0.85	29.42	6.37
2 Intervention	B1	5	0.91	0.20	0.80	25.60	10.52
	B2	5	0.94	0.40	0.80	22.00	9.87
	C1	8	0.86	0.37	0.87	20.00	6.07
3 Intervention	B1	6	0.91	0.33	0.83	28.83	9.15
	B2	3	0.94	0.33	0.66	16.66	10.69
	C1	10	0.87	0.20	0.90	32.40	7.66
Posttest	-	19	0.94	0.68	0.94	32.42	7.06

Reliability analysis indicated that the test instruments demonstrated acceptable to very high internal consistency across all phases. The pretest showed good reliability (α = 0.89) while the posttest showed extremely high reliability (α = 0.94). Except for the Intervention 1 at level B2 which had a moderate reliability (Cronbach's Alpha = 0.65), most of the levels had a good dependability during the intervention. Reliability rose in later phases, and was consistently good (especially for Interventions 2 and 3 at B1, B2 and C1 levels).

The analysis of mean scores showed that reading performance was significantly different among interventions and levels of proficiency. Mean scores at B1 and C1 were higher than at B2, with the highest mean at Intervention 3, level C1. The mean score on the posttest was higher than the mean score on the pretest; generally, reading performance improved. Standard deviations of the interventions suggested moderate to high variability, especially in Intervention 2 at B1 and Intervention 3 at B2. Conversely, the standard deviation on the posttest was 7.07, which was lower than the pretest at 9.24, indicating that students' performance was more consistent at the end of the study.

Table 7. Pired Sample T-test

Paired samples statistics			
	Mean	N	Std. Deviation
Pretest	57.26	19	17.81
posttest	90.84	19	14.13

The paired-samples statistics indicate that students' mean scores increased from 57.26 in the pretest to 90.84 in the posttest among 19 participants, demonstrating substantial overall improvement in intensive reading performance. The standard deviation decreased from 17.82 to 14.13, reflecting more consistent scores and reduced variability after the intervention.

Table 8. Summary of Paired-Sample t-Test Results

Paired sample T-test				
N	**Mean**	**t**	**df**	**Sig. (2-tailed)**
19	–33.58	–9.248	18	.000

The table 8 demonstrated a statistically significant difference between pretest and posttest scores, t = –9.248, p < .05. The negative t value and the mean difference of –33.58 suggest that the students' posttest scores were significantly higher than their pretest levels. The significance value (p = .000) is below 0.05 based on the paired-sample t-test. Hence, the null hypothesis (H0) is rejected and alternative hypothesis (H1) is accepted.

Qualitative Findings

This section reports the qualitative findings from interviews with five students in an intensive reading class. The students had different reading levels: advanced, intermediate, and lower. Two main themes emerged. First, students saw adaptive assessment as a fair and clear way to evaluate their reading ability. Second, the combination of differentiated instruction and adaptive assessment increased their motivation and engagement in learning.

Table 9. Participant Profile

Participant	**Gender**	**Learning Level**	**Role in Study**
VER	Female	Advanced	Interview participant
PAN	Male	Advanced	Interview participant
TAB	Female	Advanced	Interview participant
SAR	Female	Medium	Interview participant
KAD	Female	Lower	Interview participant

Table 9 provides background information about the participants involved in the study. The variation in reading levels ensures that the findings represent diverse learning experiences, ranging from lower, to advanced proficiency.

Adaptive Assessment as a Fair and Accurate Evaluation of Students' Intensive Reading Achievement

This theme shows that students saw adaptive assessment as a fair, clear, and accurate way to evaluate their intensive reading skills. They received the assessment not as a number but as a meaningful process reflecting their real abilities and progress. Students stated the

adaptive assessment helps them know their reading ability through an ongoing level-based assessment.

This approach seemed fair as they were assessed based on their own ability, not toward one another. The ongoing feedback provided them the opportunity to track their progress and make the process transparent and motivating.

Tabel 10. Coding Structure for Theme 1

Code	Category	Theme	Representative Quotation
awareness of reading level accurate	Assessment Transparency	Adaptive Assessment as a Fair and Accurate Evaluation of Students' Intensive Reading Achievement	"Lebih kayak, ternyata kemampuan aku itu masih di sini. Jadi tahu level aku di mana." (SAR)
clear measurement of ability	Accuracy of Measurement		"Terbantu, karena bukan hanya nilai mentah. Jadi kita tahu kemampuan kita di mana." (VER)
fair assessment experience	Perceived Fairness		"Merasa terbantu dengan penilaian yang dibedakan itu, karena sesuai kemampuan." (SAR) Ya, kayak ya lebih adil saja lebih tahu gitu lo kak level kita di mana begitu (SAR) mereka berada di porsinya yang pas Jadi mereka tetap boleh belajar dengan baik. (VER)
continuous feedback	Formative Feedback Function		"Setiap dua minggu sekali, kita merasa oh ini kemampuan aku di sini." (VER)
motivation through assessment	Assessment-Induced Motivation		"Kalau nilainya segitu kadang malas, nah ini boleh nge-push kita." (VER) Termotivasi banget Untuk belajar, dan Deg-degan banget (KAD)

Table 10 shows that students view adaptive assessments as clear and accurate for evaluating intensive reading. VER notes that these assessments reveal actual reading ability beyond raw scores, and that every two weeks feedback allows students to monitor their formative progress.

The system is fair, since the tasks are differentiated by skill level," SAR considers. Accuracy creates motivation. As VER states, meaningful feedback "pushes" students to improve rather than discouraging them and offers a clear and supportive path to achieve improvement.

The Impact of the Implementation on Students' Motivation and Engagement

This design demonstrates that differentiated instruction and adaptive assessment combined improve students' motivation and engagement. Tasks match each student's level, and continuous feedback keeps them focused. Students experienced more confident and participated more when challenges were appropriate.

Tabel 11. Coding Structure for Theme 2

Code	Category	Theme	Representative Quotation
motivation to improve level	Goal-Oriented Motivation	The impact of the implementation on Students' Motivation and Engagement	"Kita pengen naik ke level selanjutnya." (SAR)
Learning at appropriate level	Learning Confidence		"Setiap orang punya porsinya masing-masing." (PAN) "Kalau saya kan masih pemula, jadi dikasih soal yang baru-baru pemula itu jadi lebih gampang untuk memahami." (KAD) Yang Masih Pemula itu dia merasa kewalahan, Terus yang memang Udah expert itu dia malah Nyepelein jadi menurut saya Lebih bagus seperti ini. (TAB)
Sustained learning challenge	Sustained Cognitive Challenge		"Kalau pembelajaran disamaratain, yang tinggi jadi kurang menantang." (PAN)

Active participation	Active Learning Engagement	Kalau saya merasa Lebih terlibat. faktornya juga Saya jadi lebih mikir, Saya jadi benar-benar berfikir keras untuk mengerjakannya (TAB) Kalau menurut saya Saya lebih terlibat karena Tingkat-tingkat itu kan kita Belajar hal-hal baru terus (PAN)
encouragement through feedback	Motivational Awareness	"Ini boleh nge-push kita gitu loh." (VER)

Table 11 shows that integrating differentiated instruction and adaptive assessment increased student motivation and engagement at all proficiency levels. Students report that assigning tasks according to individual needs is the most important thing to keep them motivated and clear about what is expected. SAR had a strong goal-oriented drive to "get to the next level" while PAN commented that getting "their own share" of ability-based activities was a big confidence builder.

This method was a direct assistance to understanding; KAD said that tasks at the beginner level made the content "easier to understand," while PAN noted that uniform tasks were "less challenging" for more advanced students. TAB also maintained engaged participation with abilities "continuing to be honed" and VER explained that feedback "pushes us on" to retain effort and awareness. Ultimately, these responses indicate how difficulty matched to ability makes for a balanced environment where students feel both supported and continuously challenged.

Classroom Observation of Intensive Reading Instruction

Classroom observations were conducted toward in an intensive reading class at the University of Bandar Lampung from September 16, 2025 to January 6, 2026. The purpose was to explore the use of differentiated instruction and adaptive assessment and student participation. At the very beginning, students' basic reading skills were measured by a diagnostic reading exam and then categorised by ability. The early sessions were alert, though some of the items were simple. Later, differentiated education included teaching reading methods like skimming and scanning, group exercises and lecturer feedback. Digital tools and quizzes that gave instant response were used in adaptive assessment.Students were given challenging work and with time became more confident and independent. By the last session participation was more consistent and attentiveness was better and students were more independent in their work on the tasks. In conclusion, these strategies were effective in promoting reading development and engagement.

Discussion

This section presents the findings of this study, linking the quantitative and qualitative findings to the theoretical framework and previous research. It also discusses results that were not as expected and provides an explanation based on actual evidence and classroom environment. Finally, statistical findings are contextualised based on insights from interviews and observations in the classroom.

Differentiated Instruction and the Development of English reading comprehension

The quantitative findings show that differentiated instruction significantly improved students' English reading comprehension. The reading scores increased significantly from 57.26 to 90.84 (t = -9.248, p<.05) indicating that the teaching strategy was effective. Rasch logit scores captured this progression. Students started at different levels of preparedness, but several, including MUHFA, MARS and CAN, successfully moved up to higher competency levels.

This positive tendency is in line with Tomlinson (2001) readiness-based paradigm and with research demonstrating that tailored instruction allows students to improve gradually (Gheyssens et al., 2020; Silva-Maceda & Camarillo-Salazar, 2021). Furthermore, the Rasch based evaluation was sensitive enough to capture subtle progression within skill levels, not just general improvements. The findings of Ebenbeck & Gebhardt (2022) suggest that adaptive systems are relevant for monitoring complex reading development.

Adaptive Assessment as a Fair and Accurate Measurement of Reading Ability

The Rasch logit scores can be used in adaptive assessments to track slow learning progress even if no formal level modifications are made Ebenbeck & Gebhardt (2022). This method matches the difficulty level of the questions to the ability of the individual, reducing their worry and increasing their confidence. Therefore it offers students clear information about their strong points and potential areas for development, as well as stimulating further self-reflection and active participation, through a fair and transparent assessment process.

The Impact of the Implementation on Students' Motivation and Engagement

Results from interviews and observations suggest that customized instruction and flexible assessments improved the motivation and confidence of students. The tasks were aligned to ability levels . Students showed more persistence and independence in reading. A few students remained static due to absences, but most raised their method use and motivation to reach higher levels which is a substantial qualitative change in their learning (Silva-Maceda & Camarillo-Salazar, 2021). While the overall outcomes improve, not all pupils had positive improvements in competence levels. Some students remained on the same level and a few were automatically placed on the lower level since they were not present for the assessment.

CONCLUSION

The study demonstrated that combining differentiated instruction and adaptive assessment effectively improved the intensive reading performance of EFL university students. Quantitative findings revealed significant gains between the pre-test and post-test, while Rasch logit scores confirmed improvements in both students' reading ability levels and individual progress. Qualitative findings showed that matching reading activities to students' proficiency levels increased engagement, classroom participation, and awareness of reading development. These results suggest that differentiated instruction and adaptive assessment provide a practical framework for enhancing EFL reading instruction. By using level-appropriate texts and learning activities, teachers can reduce learning barriers and better accommodate diverse student needs. Rasch-based adaptive assessment also offers more accurate feedback on students' reading progress, enabling instructors to adjust instructional materials, tasks, and feedback effectively. In practice, teachers should assess students' reading proficiency, group learners according to their ability levels, and provide suitable reading

materials and activities for each group. Future research should involve larger samples, longer intervention periods, and anchor assessments to strengthen the generalizability and comparability of findings, while exploring adaptive approaches in other language skills.

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