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Teachers' Understanding and Practices of Adaptive Formative Assessment: A Pilot Study with Pre-Service English Teachers

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Abstract
Adaptive formative assessment emphasizes the use of evidence of learning to adjust instruction to learners' needs, abilities, and learning progress. This paper explores pre-service English teachers' conceptual understanding and reported practices of adaptive formative assessment. The study employed a pilot survey design involving 60 pre-service English teachers who had completed courses in English language teaching methodology and educational assessment and were undertaking teaching practicum. Data were collected using a questionnaire comprising 30 items measuring conceptual understanding and 32 items measuring reported practices of adaptive formative assessment. The data were analyzed descriptively using means and standard deviations. The findings indicated that pre-service teachers' conceptual understanding was generally high to very high, particularly regarding instructional responsiveness, feedback provision, and support for learner responsibility. Their reported practices also showed generally high levels, particularly in communicating learning objectives, checking students' understanding, providing feedback, and adjusting instruction. However, practices involving peer assessment, self-assessment, flexible grouping, differentiation, and the development of learner agency were reported at relatively lower levels. The findings suggest partial alignment between conceptual understanding and reported practices, highlighting the importance of strengthening practical experiences and teacher education approaches that promote systematic instructional adaptation and learner agency among pre-service teachers.

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Introduction

English language teaching in Indonesia faces significant challenges related to individual differences and variations in students' abilities. Classes are generally heterogeneous, with students differing in English proficiency, learning backgrounds, learning experiences, and levels of engagement. Such conditions can pose challenges for teachers in designing and implementing assessment practices that can provide accurate information about individual students' learning progress (Dewi & Mutammam, 2022; Pujiani et al., 2022). In the context of educational reform in Indonesia, teachers also encounter various contextual barriers in translating assessment reform principles into classroom teaching practices (Arrafii, 2023).

In practice, formative assessment in English language teaching may still be implemented through relatively uniform procedures and may focus primarily on the completion of particular assessment tasks or activities. Research on Indonesian teachers' conceptions of assessment has shown that teachers hold diverse understandings of the purposes and functions of assessment, encompassing both assessment-for-learning orientations and more traditional assessment functions (Arrafii, 2021, 2022). Research on the implementation of *Assessment for Learning*

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pp. 96-117

(AfL) in Indonesian EFL secondary schools has also shown that teachers employ various AfL strategies, although the quality and characteristics of their implementation vary (Burhanuddin et al., 2025). These findings suggest that the use of formative assessment strategies does not necessarily mean that assessment evidence is optimally used to adapt instruction to individual students' learning needs.

Adaptive formative assessment has emerged as a potentially useful approach to addressing these challenges. This approach can be understood through the integration of two pedagogical perspectives, namely *Assessment for Learning* (AfL) and *adaptive teaching* or differentiation. AfL positions assessment as an integral part of the learning process, whereby evidence of student learning is elicited and used to determine subsequent instructional actions (Black & Wiliam, 2018). Meanwhile, *adaptive teaching* or differentiated instruction emphasizes the adjustment of content, processes, products, and learning support in response to students' diverse characteristics and needs (Tomlinson, 2017). By integrating these two perspectives, adaptive formative assessment can be understood as an assessment approach that uses information about students' learning to adjust tasks, levels of support, instructional strategies, and feedback according to individual learning needs (Arrafii & Suadiyatno, 2024). Thus, assessment serves not only to identify learning achievement but also as a source of information for pedagogical decision-making and instructional adaptation (Black & Wiliam, 2018; Nguyen & Dao, 2024).

Conceptually, however, adaptive formative assessment should not be understood simply as another term for AfL or differentiated instruction. Rather, it foregrounds the relationship between assessment evidence and the pedagogical responses that follow from that evidence. AfL provides the assessment-oriented logic of eliciting, interpreting, and using evidence to move learning forward, whereas adaptive teaching and differentiation provide a pedagogical orientation toward responding to variation in students' learning needs. Adaptive formative assessment brings these complementary orientations together by emphasizing how evidence of individual learning informs decisions about what to teach next, which tasks or learning opportunities to provide, what feedback to offer, and how much or what kind of support to make available. In this sense, its defining feature is not merely the presence of formative assessment strategies or differentiated instructional arrangements, but the purposeful connection between ongoing assessment, interpretation of learning needs, and subsequent instructional adaptation.

This conceptual distinction also identifies an important limitation in treating AfL and differentiated instruction as sufficient indicators of adaptive formative assessment. A teacher may elicit evidence of learning, provide feedback, or communicate learning goals without using the evidence to modify instruction in response to students' demonstrated needs. Similarly, a teacher may differentiate tasks or group students according to perceived ability without systematically using ongoing assessment evidence to determine whether those arrangements are appropriate or effective. Although these practices may contribute to learning, neither necessarily demonstrates the integration of assessment-informed decision-making and adaptive pedagogical action. Adaptive formative assessment therefore offers a useful analytical perspective for examining whether teachers understand and report practices that connect the collection and interpretation of assessment evidence with context-sensitive decisions about learning activities, feedback, and instructional support.

Effective implementation of adaptive formative assessment, however, requires both conceptual understanding and practical capacity among teachers. Research on differentiated

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assessment in the Indonesian EFL context indicates that this approach has the potential to respond to student diversity, but its implementation also faces various contextual challenges (Arrafii & Suadiyatno, 2024). Furthermore, research on teachers' understanding of assessment has shown that teachers' conceptions of the purposes and functions of assessment are closely related to how assessment is implemented in practice (Arrafii, 2021, 2022). Although previous research suggests that teachers have developed an understanding of and experience with formative assessment principles, the implementation of AfL in Indonesian EFL schools continues to vary in quality and depth and may sometimes be implemented in procedural ways (Burhanuddin et al., 2025). Research on assessment reform in Indonesia has also demonstrated that the implementation of assessment practices is influenced by various contextual factors, meaning that teachers' conceptual understanding does not automatically translate into practices that are consistent with the goals of assessment reform (Arrafii, 2023).

These issues are particularly relevant to the preparation of pre-service English teachers. Developing the capacity to respond to learner diversity requires more than familiarity with individual assessment techniques or differentiation strategies; it also requires an understanding of how assessment evidence can guide instructional decisions and how those decisions can be adjusted as students' learning develops. Examining conceptual understanding alongside reported practices is therefore important because the two dimensions provide complementary, although not interchangeable, information. Conceptual understanding concerns teachers' knowledge of the principles and decision-making processes underlying adaptive formative assessment, whereas reported practices concern the extent to which teachers indicate that they enact those principles in their assessment and instructional activities. Examining both dimensions can help identify areas of alignment and potential gaps without assuming that self-reported practices necessarily represent observed classroom competence.

Thus, a research gap remains concerning empirical investigations that specifically integrate teachers' conceptual understanding and practices of adaptive formative assessment. Previous research in Indonesia has examined teachers' conceptions of assessment (Arrafii, 2021, 2022), the implementation of AfL (Burhanuddin et al., 2025), and differentiated assessment (Arrafii & Suadiyatno, 2024), but these strands of research do not, on their own, establish how teachers understand and report practices that connect assessment evidence with differentiated pedagogical responses as a coherent construct. The gap is therefore not simply the absence of another study of formative assessment or differentiation. It concerns the limited empirical operationalization of adaptive formative assessment as an integrated domain encompassing both knowledge of assessment-informed adaptation and reported practices through which such adaptation is enacted. Addressing this gap requires an initial investigation that clarifies how these dimensions can be represented and examined together, rather than assuming that findings about AfL, assessment conceptions, or differentiated instruction automatically capture the integrated construct.

A pilot study is a useful first step in this process because the integrated construct needs to be translated into indicators that adequately represent both its assessment-related and adaptive pedagogical dimensions. In particular, an initial investigation can examine whether the proposed knowledge and practice domains are sufficiently comprehensive and conceptually distinguishable, identify potential gaps or ambiguities in their operationalization, and provide preliminary evidence to inform subsequent instrument refinement and larger-scale validation. Such a study is not intended to establish the definitive structure or validity of adaptive formative assessment as a construct, nor to demonstrate

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teachers' actual classroom competence. Instead, it provides an initial empirical basis for investigating how pre-service English teachers understand the principles of adaptive formative assessment and how they report applying them. This preliminary focus is especially pertinent in the Indonesian EFL context, where existing research provides a foundation in assessment conceptions, AfL, and differentiated assessment but leaves room for a more integrated examination of assessment-informed pedagogical adaptation.

Accordingly, this pilot study explores pre-service English teachers' conceptual understanding and reported practices of adaptive formative assessment. It aims to provide preliminary empirical insights into these two dimensions and inform further development and validation of an instrument for examining adaptive formative assessment in English language teacher education. The study addresses the following research questions:

1. What is the level of pre-service English teachers' conceptual understanding of the principles of adaptive formative assessment?
2. What adaptive formative assessment practices do pre-service English teachers report?

Research Method

Research Design

This study employed a survey research design to explore pre-service English teachers' conceptual understanding and reported practices of adaptive formative assessment. A survey design was selected because it enables researchers to obtain structured data on respondents' knowledge, understanding, and reported practices through a standardized instrument (Creswell & Creswell, 2018). In the present study, the survey was conducted as a pilot study to obtain an initial picture of how pre-service teachers understand the principles of adaptive formative assessment and the extent to which these principles are reflected in their reported practices. The use of a questionnaire as a survey instrument also facilitates the efficient and consistent collection of data from all respondents (Artino et al., 2014).

The study was descriptive in nature and was not intended to examine causal relationships or generate generalizations to the broader population of pre-service English teachers. As a pilot study, the findings were primarily intended to identify initial patterns in conceptual understanding and reported practices and to provide a basis for further instrument refinement and subsequent research.

Participants

The participants consisted of 60 pre-service English teachers enrolled in an English Language Education program. The participants were selected because they had completed courses related to English language teaching methodology and educational assessment and had gained teaching experience through teaching practicum. Thus, the participants possessed relevant prior knowledge and experience to provide information about their understanding and reported practices of adaptive formative assessment. The participants were enrolled in 2025/2026 academic year at Mandalika University of Education Mataram. Their completion of relevant coursework and teaching practicum provided them with foundational knowledge of instructional planning, classroom assessment, and teaching practices, making them appropriate participants for an initial exploration of pre-service teachers' knowledge and reported practices of adaptive formative assessment.

Participants were recruited using convenience sampling, involving pre-service teachers who were available and willing to participate in the pilot study. Participation was voluntary.

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

Before completing the questionnaire, participants were provided with information about the purpose of the study and were asked to provide informed consent. No personally identifying information was used in reporting the findings. The use of convenience sampling was appropriate for the exploratory purpose of this pilot study, but it limits the representativeness of the sample. The participants may differ from pre-service English teachers in other institutions, study years, or teacher education contexts in terms of their coursework, practicum experiences, and preparation for formative assessment. Accordingly, the findings should be interpreted as preliminary and context-specific rather than generalizable to the wider population of pre-service English teachers. The results are intended to provide initial insights into the measurement of adaptive formative assessment knowledge and reported practices and to inform further instrument refinement and validation with larger, more diverse samples.

Instrument

An instrument entitled the Teacher Adaptive Formative Assessment Inventory (TAFAI) was developed to measure teachers' understanding and practices related to adaptive formative assessment. The development of the instrument items was informed by the literature on formative assessment (Black & Wiliam, 2018; Wiliam & Thompson, 2007), differentiated assessment, and adaptive teaching (Tomlinson, 2017; Scarparolo & Subban, 2023). Based on a synthesis of the literature in these areas, four theoretical dimensions of adaptive formative assessment were identified: (1) feedback practices, (2) instructional adjustment, (3) student engagement, and (4) differentiated support. Specifically, the TAFAI measures two broad constructs, namely teachers' *knowledge* and *practice* of adaptive formative assessment.

Table 1. Sample of item of *Knowledge* Scales

Item	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree
#1	Formative assessment is an ongoing process of gathering evidence to support learning.				
#3	Students' interim learning outcomes should be used to inform instructional decisions				

Table 2. Sample of items of *Practice* Scales

Item	Statement	Never	Rare	Often	Always
#2	I communicate learning objectives in various ways (e.g., through examples or visual media).				
#5	I change how I explain learning objectives when students appear not to understand them				

An initial pool of items was developed based on these theoretical foundations, consisting of 39 items for the *knowledge* scale and 40 items for the *practice* scale. Both scales were reviewed by two experts in language assessment and teacher education to ensure the relevance and clarity of the items. This process resulted in a reduction in the number of items in both scales and extensive item revisions. Subsequently, one of the experts participated in a cognitive interview with the corresponding author to examine the comprehensibility of the

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Vol.4, No.2 (October – 2026)
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pp. 96-117

questionnaire and the clarity of individual items. Based on these validation processes, the TAFAI was comprehensively revised.

The final version of the TAFAI consisted of 30 items for the *knowledge* scale, using a four-point Likert scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*), and 32 items for the *practice* scale, using a four-point frequency scale ranging from 1 (*Never*) to 4 (*Always*). The TAFAI then underwent a final revision before being piloted with pre-service English teachers. The data reported in the present study were derived from this pilot administration.

The suitability of the data for exploratory factor analysis was supported by the Kaiser–Meyer–Olkin (KMO) measures of sampling adequacy and Bartlett's tests of sphericity. The knowledge scale yielded a KMO value of .663, while the practice scale yielded a KMO value of .675. Bartlett's tests of sphericity were statistically significant for both scales ($p < .001$), indicating that the correlation matrices were suitable for factor analysis. Internal consistency analysis also indicated high reliability for both scales. The knowledge scale demonstrated a Cronbach's alpha coefficient of .935, and the practice scale yielded an alpha coefficient of .947. Both coefficients substantially exceeded the commonly used .70 threshold, indicating excellent internal consistency in this pilot sample.

Data Collection

Data were collected using a questionnaire designed to measure two main aspects: conceptual understanding of adaptive formative assessment and reported practices of adaptive formative assessment. The development of the questionnaire followed established principles of survey instrument development, including literature review, item generation, expert review, assessment of item comprehensibility, and pilot testing prior to its use in a larger study (Artino et al., 2014).

The questionnaire consisted of 30 items measuring conceptual understanding and 32 items measuring reported practices of adaptive formative assessment. The conceptual understanding section used a four-point Likert scale, whereas the practice section used a four-point frequency scale. The questionnaire was distributed online through Google Forms. The survey was open for two weeks, from 1 to 15 June 2026. Online survey administration enabled the questionnaire to be distributed efficiently and facilitated the structured collection and management of the data. As with online surveys generally, the data collection procedure paid attention to clear instructions, ease of completion, voluntary participation, and the confidentiality of participants' data (Ball, 2019; Minnaar & Heystek, 2013).

The questionnaire link was distributed to potential participants through communication channels used by the researcher. Participants completed the questionnaire independently after reading the study information and providing informed consent. The collected data were subsequently exported from Google Forms for data screening, coding, and descriptive statistical analysis.

Data Analysis

The data were analyzed using descriptive statistical procedures to address the two research questions concerning conceptual understanding and reported practices of adaptive formative assessment. Because the primary purpose of the study was to describe the level of understanding and reported practices rather than to examine causal relationships, the analysis focused on identifying response patterns, levels of conceptual understanding, levels of reported practice, and descriptive differences between the two aspects. The use of descriptive

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

statistics is appropriate for providing a systematic overview of the characteristics and patterns within a dataset prior to further analysis (Creswell & Creswell, 2018; Field, 2018).

To address the first research question, concerning the level of pre-service teachers' conceptual understanding of the principles of adaptive formative assessment, responses to the *knowledge* scale were analyzed at both the item and dimensional levels using descriptive statistics. The analysis included the mean, standard deviation, minimum and maximum scores, and response percentages for each item. Mean scores were also calculated for each theoretical dimension of adaptive formative assessment. These dimensions represented the key principles underlying adaptive formative assessment, including feedback practices, instructional adjustment, student engagement, and differentiated support. Higher mean scores indicated stronger agreement with statements representing the conceptual principles of adaptive formative assessment.

To facilitate interpretation, mean scores on the four-point *knowledge* scale were classified into four categories using equal intervals. With a theoretical score range of 1–4, the interval width was calculated as $(4 - 1)/4 = 0.75$. Accordingly, mean scores were interpreted as follows: 1.00–1.75 = very low; 1.76–2.50 = low; 2.51–3.25 = high; and 3.26–4.00 = very high. These categories were used solely as descriptive aids and were not intended to represent empirically validated cut-off points established externally.

To address the second research question, concerning reported practices of adaptive formative assessment in the classroom, the *practice* scale was analyzed using the same descriptive procedures. The analysis was conducted at both the item and dimensional levels by calculating the mean, standard deviation, minimum and maximum scores, and response distributions. Practice items were grouped according to the dimensions represented in the TAFAI, enabling the researchers to identify the extent to which participants reported implementing practices related to adaptive feedback, instructional adjustment, student engagement, and differentiated support. Because the *practice* scale used a four-point frequency response format, ranging from 1 (*Never*) to 4 (*Always*), higher scores indicated a higher reported frequency of implementing adaptive formative assessment practices. Such descriptive analysis enabled the systematic characterization of practice patterns in the survey data (Field, 2018; Mertens, 2020).

Mean scores on the *practice* scale were interpreted using four equal-interval categories: 1.00–1.75 = very infrequent/never; 1.76–2.50 = infrequent/low; 2.51–3.25 = frequent/high; and 3.26–4.00 = very frequent/very high. These categories were used to provide a descriptive indication of the frequency of reported practices and were not intended to suggest that the boundaries between categories represent empirically validated thresholds.

To provide a descriptive comparison of conceptual understanding and reported practices, mean scores for the *knowledge* and *practice* scales were examined across corresponding dimensions. Because the two scales measured distinct aspects of adaptive formative assessment and used different response formats, their scores were interpreted according to their respective measurement contexts rather than as directly equivalent measures. Differences between corresponding dimensional mean scores were calculated as descriptive indicators of the relative levels of reported conceptual understanding and practice. Specifically, the difference was calculated by subtracting the mean practice score from the mean knowledge score. A positive difference indicated a higher mean score for conceptual understanding than for reported practice, whereas a negative difference indicated a higher mean score for reported practice. A difference close to zero indicated that the two-dimension

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

means were numerically similar on their respective scales. These differences were used to describe patterns of similarity and discrepancy at the aggregate dimensional level, not to establish alignment between conceptual understanding and practice at the individual participant level. Because the analysis did not examine participant-level associations between the two constructs, similarities or differences in their mean scores were not interpreted as evidence that participants with higher conceptual understanding also reported more frequent adaptive formative assessment practices. Nor were these comparisons used to infer a causal relationship between knowledge and practice.

Research Findings and Discussion

Pre-Service Teachers' Level of Conceptual Understanding of Adaptive Formative Assessment Principles

To address the first research question, data from the 30-item conceptual understanding scale were analyzed using descriptive statistics, including minimum, maximum, mean, standard deviation, skewness, and kurtosis. Overall, the findings indicate that pre-service teachers' conceptual understanding of the principles of adaptive formative assessment was at a high to very high level. Most items had mean scores above 3.00, with means ranging from 2.80 to 3.52. These findings suggest that respondents generally expressed positive understanding of the key principles of formative assessment, adaptive teaching, differentiation, feedback, and the development of students' learning independence.

In terms of formative assessment, respondents' understanding was generally high to very high. The item concerning formative assessment as an ongoing process of collecting evidence to support learning obtained a mean of 3.36 (SD = 0.580). Similarly, understanding of the distinction between formative and summative assessment had a mean of 3.34 (SD = 0.545). Respondents also demonstrated a very high level of understanding that interim learning results should be used to inform instructional decisions (M = 3.29; SD = 0.496) and that summative assessment results can be used formatively to adjust subsequent instruction (M = 3.27; SD = 0.447).

However, there were indications of some conceptual inconsistencies regarding the function of formative assessment. The statement that "formative assessment is mainly used to give students grades" obtained a mean of 2.97 (SD = 0.870). Because this statement is conceptually inconsistent with the principles of formative assessment, the negatively worded item was reverse-coded before calculating the dimensional and overall mean scores, ensuring that higher scores consistently represented a stronger understanding of formative assessment. Accordingly, the mean reported for this item should be interpreted in relation to its original wording, rather than as an indication of respondents' conceptual understanding based on the reverse-coded score. A similar pattern was found for the statement that formative assessment is "mainly used at the end of instruction," which obtained a mean of 3.00 (SD = 0.844). This item was also reverse-coded before the calculation of dimensional and overall mean scores, where applicable. These findings are important because they indicate that although respondents generally understood the characteristics of formative assessment, some potential misconceptions remained regarding its purpose and timing. The interpretation of these negatively worded items is therefore distinguished from the interpretation of the reverse-coded scores used in the aggregate analyses.

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Table 3. Descriptive Statistics of *Knowledge* Scales

						Variance	Skewness		Kurtosis	
Item	N	Min	Max	Mean	SD	Statistic	Statistic	Std. Error	Statistic	Std. Error
1	59	1	4	3,36	0,580	0,337	-0,778	0,311	2,799	0,613
2	59	2	4	3,34	0,545	0,297	0,021	0,311	-0,756	0,613
3	58	2	4	3,29	0,496	0,246	0,479	0,314	-0,722	0,618
4	56	3	4	3,27	0,447	0,200	1,078	0,319	-0,871	0,628
5	59	1	4	2,97	0,870	0,757	-0,908	0,311	0,543	0,613
6	58	2	4	3,50	0,570	0,325	-0,590	0,314	-0,643	0,618
7	60	2	4	3,38	0,524	0,274	0,123	0,309	-1,191	0,608
8	60	2	4	3,30	0,530	0,281	0,169	0,309	-0,594	0,608
9	60	2	4	3,23	0,533	0,284	0,177	0,309	-0,142	0,608
10	60	1	4	2,80	0,953	0,908	-0,554	0,309	-0,495	0,608
11	60	2	4	3,35	0,515	0,265	0,256	0,309	-1,078	0,608
12	60	2	4	3,23	0,500	0,250	0,411	0,309	-0,066	0,608
13	60	2	4	3,23	0,533	0,284	0,177	0,309	-0,142	0,608
14	60	3	4	3,40	0,494	0,244	0,419	0,309	-1,889	0,608
15	60	1	4	2,90	0,877	0,769	-0,580	0,309	-0,169	0,608
16	60	3	4	3,52	0,504	0,254	-0,068	0,309	-2,065	0,608
17	59	2	4	3,36	0,517	0,268	0,227	0,311	-1,095	0,613
18	60	2	4	3,37	0,551	0,304	-0,072	0,309	-0,833	0,608
19	60	2	4	3,35	0,515	0,265	0,256	0,309	-1,078	0,608
20	58	1	4	3,26	0,739	0,546	-0,998	0,314	1,358	0,618
21	60	2	4	3,42	0,619	0,383	-0,560	0,309	-0,561	0,608
22	60	2	4	3,27	0,548	0,301	0,072	0,309	-0,374	0,608
23	60	3	4	3,42	0,497	0,247	0,347	0,309	-1,946	0,608
24	60	3	4	3,32	0,469	0,220	0,809	0,309	-1,394	0,608
25	59	1	4	3,02	0,861	0,741	-0,537	0,311	-0,369	0,613
26	60	2	4	3,23	0,500	0,250	0,411	0,309	-0,066	0,608
27	57	3	4	3,40	0,495	0,245	0,404	0,316	-1,905	0,623
28	60	2	4	3,15	0,515	0,265	0,225	0,309	0,523	0,608
29	60	2	4	3,23	0,465	0,216	0,756	0,309	-0,086	0,608
30	60	1	4	3,00	0,844	0,712	-0,876	0,309	0,618	0,608

Regarding adaptive teaching, the level of understanding was also relatively high. The statement that adaptive teaching involves adjusting instruction based on students' needs obtained the highest mean within this aspect, at 3.50 (SD = 0.570). Understanding that individual differences among students can determine instructional approaches also showed a high mean (M = 3.38; SD = 0.524). In addition, respondents reported understanding when and how to modify instructional methods during instruction (M = 3.30; SD = 0.530) and how to use assessment results to make real-time instructional adjustments (M = 3.23; SD = 0.533).

Nevertheless, there were also indications of some inconsistency in understanding the adaptive nature of teaching. The statement that "effective teaching follows the initial plan without changes during instruction" obtained a mean of 2.80 (SD = 0.953). Because this

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statement contradicts the principle of adapting instruction in response to students' needs and learning evidence, the relatively high score suggests that some respondents may still accept the idea that instructional effectiveness is primarily determined by adherence to an initial lesson plan. Thus, the concept of adaptive teaching may not yet be fully internalized as a process of responsive decision-making based on learning evidence generated during instruction.

Regarding instructional differentiation, respondents demonstrated relatively strong understanding. The statement that differentiation involves adjusting content, process, and learning products obtained a mean of 3.35 (SD = 0.515). Understanding that learning goals may be adjusted when students have diverse characteristics also showed a high mean (M = 3.40; SD = 0.494). Respondents also reported understanding how to design learning tasks according to different levels of student readiness (M = 3.23; SD = 0.500) and provide various instruments through which students can demonstrate their learning (M = 3.23; SD = 0.533).

However, understanding of differentiation also revealed areas that require further strengthening. The statement that "all students should be taught and assessed in exactly the same way" obtained a mean of 2.90 (SD = 0.877). Because this statement contradicts the principle of differentiation, the relatively high response suggests that some pre-service teachers may still tend to view uniformity in teaching and assessment as appropriate practice. This may indicate a gap between their declarative recognition of differentiation and a deeper understanding of its implications for instructional and assessment design.

Regarding feedback, respondents' conceptual understanding was one of the strongest areas. The statement that effective feedback leads to improved learning obtained a mean of 3.52 (SD = 0.504), which was the highest mean across all 30 items. Respondents also demonstrated a high level of understanding of the characteristics of actionable feedback (M = 3.36; SD = 0.517), adapting feedback to individual student needs (M = 3.37; SD = 0.551), and the role of feedback in reducing learning gaps (M = 3.35; SD = 0.515). These findings suggest that, conceptually, pre-service teachers generally understand that feedback in formative assessment is not merely information about learning outcomes but should be used to support learning improvement and progress.

Nevertheless, one finding requires attention. The statement that feedback is useful for assessing students' final learning outcomes obtained a mean of 3.26 (SD = 0.739). Because this function is more closely associated with summative assessment than with the primary function of formative feedback, the relatively high score may indicate some overlap in respondents' understanding of formative and evaluative/summative functions.

The final aspect concerns learner agency and students' involvement in the assessment process. Respondents demonstrated a high level of understanding that students are responsible for their own learning (M = 3.42; SD = 0.619), that goal setting can support learning (M = 3.42; SD = 0.497), and that peer assessment can contribute to learning (M = 3.32; SD = 0.469). Understanding of strategies that support self-assessment was also relatively high (M = 3.27; SD = 0.548). These findings suggest that pre-service teachers generally understand that adaptive formative assessment is not solely centered on teacher decision-making but also involves students as active agents in the learning process.

Nevertheless, two items indicated some inconsistency in understanding. The statement that students can learn effectively when the teacher is the main source of knowledge obtained a mean of 3.02 (SD = 0.861). Meanwhile, understanding of how to use peer assessment as a learning strategy obtained a mean of 3.15 (SD = 0.515). These findings suggest that teacher-centred orientations remain relatively strong among some respondents, while understanding

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of peer assessment as a learning mechanism may not be as strong as their understanding of the importance of student responsibility and goal setting.

Overall, the pattern of findings indicates that pre-service teachers' conceptual understanding is relatively strong regarding the general principles of adaptive formative assessment but is not yet fully consistent when these principles are applied to more specific conceptual situations. The highest mean scores were found for the understanding that effective feedback leads to improved learning (M = 3.52) and that adaptive teaching involves adjusting instruction based on students' needs (M = 3.50), followed by understanding students' responsibility for their own learning (M = 3.42) and the importance of goal setting (M = 3.42). In contrast, the lowest mean was found for the statement that effective teaching follows the initial plan without changes during instruction (M = 2.80), followed by the statement that all students should be taught and assessed in the same way (M = 2.90).

Interestingly, several statements that were conceptually negative or inconsistent with the principles of adaptive formative assessment still received relatively high scores. This pattern was particularly evident in beliefs that formative assessment is used to assign grades (M = 2.97), formative assessment is used at the end of instruction (M = 3.00), the teacher is the main source of knowledge (M = 3.02), and all students should be taught and assessed in the same way (M = 2.90). These findings may indicate that pre-service teachers have developed declarative knowledge of the terminology and general principles of adaptive formative assessment, while some of their understandings remain intertwined with traditional assessment paradigms and more teacher-centred approaches to teaching and learning.

Thus, in response to the first research question, pre-service teachers' conceptual understanding of the principles of adaptive formative assessment was generally at a high to very high level. However, their understanding was not fully consistent in areas that distinguish formative from summative assessment, emphasizing the use of assessment evidence to adapt instruction, promote differentiation, and strengthen student agency. The findings suggest that pre-service teachers have established a relatively strong conceptual foundation, but several areas require further strengthening, particularly the function of formative assessment, instructional flexibility, differentiation, and the shift from a teacher-centred paradigm toward teaching that is more responsive to learning evidence and individual student needs.

Pre-Service Teachers' Reported Practices of Adaptive Formative Assessment

The second major finding concerns the instructional practices reported by participants. Participants reported relatively frequent use of several practices associated with Assessment for Learning (AfL), including explaining learning objectives, checking students' understanding, asking questions to elicit evidence of learning, providing feedback, and giving students opportunities to revise their work based on feedback. These findings are broadly consistent with the core principles of AfL, whereby evidence about students' current learning is elicited and subsequently used to support further learning and instructional decision-making (Black & Wiliam, 2018). However, because the data were collected through self-report, these findings reflect participants' perceptions of the frequency of their practices rather than independently verified classroom implementation. Accordingly, the results should be interpreted as evidence of participants' reported engagement with formative assessment practices, not as direct evidence that these practices were enacted as described in actual classroom settings.

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Table 4. Descriptive Statistics of *Practice* Scales

Item	N	Min	Max	Mean	SD	Variance	Skewness		Kurtosis	
						Statistic	Statistic	Std. Error	Statistic	Std. Error
1	57	2	4	3,37	0,645	0,415	-0,523	0,316	-0,616	0,623
2	59	2	4	3,25	0,659	0,434	-0,323	0,311	-0,702	0,613
3	60	2	4	3,18	0,596	0,356	-0,075	0,309	-0,286	0,608
4	60	2	4	3,33	0,601	0,362	-0,287	0,309	-0,607	0,608
5	58	2	4	3,33	0,574	0,329	-0,143	0,314	-0,614	0,618
6	60	1	4	2,95	0,872	0,760	-0,854	0,309	0,409	0,608
7	60	2	4	3,28	0,613	0,376	-0,245	0,309	-0,560	0,608
8	60	1	4	3,23	0,698	0,487	-0,664	0,309	0,516	0,608
9	59	1	4	3,17	0,699	0,488	-0,559	0,311	0,396	0,613
10	60	2	4	3,07	0,710	0,504	-0,096	0,309	-0,962	0,608
11	60	2	4	3,20	0,576	0,332	-0,022	0,309	-0,202	0,608
12	60	2	4	3,43	0,533	0,284	-0,074	0,309	-1,262	0,608
13	60	3	4	3,43	0,500	0,250	0,276	0,309	-1,991	0,608
14	60	2	4	3,30	0,530	0,281	0,169	0,309	-0,594	0,608
15	60	2	4	3,23	0,647	0,419	-0,263	0,309	-0,645	0,608
16	60	2	4	3,30	0,530	0,281	0,169	0,309	-0,594	0,608
17	60	2	4	3,17	0,557	0,311	0,056	0,309	0,053	0,608
18	59	2	4	3,20	0,637	0,406	-0,198	0,311	-0,567	0,613
19	60	1	4	2,72	0,976	0,952	-0,526	0,309	-0,635	0,608
20	59	2	4	3,22	0,618	0,382	-0,171	0,311	-0,483	0,613
21	60	1	4	2,97	0,688	0,473	-0,280	0,309	0,116	0,608
22	60	1	4	2,88	0,691	0,478	-0,161	0,309	-0,094	0,608
23	60	1	4	3,07	0,710	0,504	-0,684	0,309	1,047	0,608
24	60	1	4	2,92	0,766	0,586	-0,559	0,309	0,379	0,608
25	59	2	4	3,39	0,588	0,345	-0,345	0,311	-0,679	0,613
26	59	2	4	3,03	0,642	0,413	-0,029	0,311	-0,478	0,613
27	60	1	4	2,93	0,778	0,606	-0,329	0,309	-0,259	0,608
28	60	2	4	3,08	0,561	0,315	0,032	0,309	0,268	0,608
29	60	2	4	3,22	0,585	0,342	-0,064	0,309	-0,302	0,608
30	59	2	4	3,24	0,536	0,288	0,155	0,311	-0,177	0,613
31	58	1	4	3,05	0,660	0,436	-0,433	0,314	0,736	0,618
32	59	1	4	2,81	0,861	0,741	-0,633	0,311	0,016	0,613

The relatively high frequency of reported feedback practices is particularly noteworthy. Participants reported that they frequently provided feedback that helped students improve their work and adjusted feedback according to individual students' needs. This pattern suggests that feedback has become a relatively familiar component of formative assessment practices among pre-service teachers. However, providing feedback and using feedback adaptively are not necessarily the same. The relatively lower score for adjusting instruction in

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

response to frequent student errors suggests that participants may be more accustomed to reporting feedback provision than to reporting the use of assessment evidence as a basis for broader instructional adjustments. Nevertheless, this interpretation concerns the relative emphasis reflected in participants' responses and should not be taken to establish a corresponding difference in their actual classroom behaviour. Self-reported frequencies may be influenced by participants' understanding of formative assessment, their recall of relevant experiences, and their tendency to provide responses that align with perceived expectations of effective teaching.

This distinction is important when considered alongside previous research on EFL teachers in Indonesia. Burhanuddin, Arrafii, and Mahsun (2025) found variation in the types and quality of AfL strategies implemented by Indonesian secondary-school EFL teachers. Their findings suggest that AfL implementation cannot be understood solely in terms of whether a particular strategy is present; the quality and pedagogical purpose of its use are also important. The present findings extend this understanding to pre-service teachers by suggesting that relatively frequent self-reported use of formative techniques may coexist with less frequent reporting of practices involving the use of assessment evidence to redesign or substantially adjust instruction. This comparison should be interpreted cautiously, however, because the present study relies on self-reported practices, whereas claims about enacted implementation require evidence from sources such as classroom observations, lesson artefacts, or stimulated-recall interviews. Thus, the present findings identify a pattern in reported practices that warrants further investigation rather than demonstrating a gap between participants stated practices and their actual classroom implementation.

These findings are also relevant to the distinction between formative assessment as a collection of techniques and formative assessment as a pedagogical process. Teachers may ask questions, provide feedback, or communicate learning objectives without necessarily using the evidence generated to make adaptive instructional decisions. From this perspective, the relatively high frequency of reported practices should be considered alongside the lower scores for practices involving more substantive adaptation, such as changing student grouping based on assessment results or designing different tasks for students with different levels of readiness. At the same time, the possibility of self-report and social-desirability bias should be acknowledged. Because the practices examined are generally regarded as desirable features of effective teaching, participants may have overreported their frequency or provided responses that reflected their knowledge of recommended pedagogical approaches rather than their typical behaviour. Although the present data cannot establish whether such bias occurred or determine its magnitude, this possibility limits the extent to which the reported frequencies can be interpreted as indicators of actual practice. Future research could address this limitation by triangulating self-reported practices with structured classroom observations, lesson plans, feedback artefacts, and interviews exploring how and why assessment evidence informs instructional decisions. Such triangulation would help establish whether the patterns identified in the present study are also evident in enacted classroom practice.

1) Communicating Learning Goals and Success Criteria

In terms of communicating learning goals, pre-service teachers reported relatively strong practices. Explaining learning objectives at the beginning of instruction obtained a mean of 3.37 (SD = 0.645), while checking students' understanding of the learning objectives during instruction obtained a mean of 3.33 (SD = 0.601). Pre-service teachers

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also reported changing how they explained learning objectives when students did not understand them (M = 3.33; SD = 0.574). These three findings indicate that communication of learning objectives was not limited to the beginning of instruction but was also relatively responsive to students' understanding.

However, adjusting success criteria to students' diverse abilities obtained a lower mean (M = 3.18; SD = 0.596). In addition, the statement that pre-service teachers communicate learning objectives in the same way to all students without adjustment obtained a mean of 2.95 (SD = 0.872). Because the latter statement is negatively worded in relation to adaptive principles, the score suggests that less adaptive practices may still occur among some respondents. Thus, pre-service teachers appear to be more consistent in communicating learning objectives than in differentiating how objectives and success criteria are communicated to students.

2) Eliciting Evidence of Learning and Adapting Instruction During the Learning Process

Practices related to eliciting evidence of learning were also reported relatively frequently. Using various questioning techniques to determine students' understanding obtained a mean of 3.28 (SD = 0.613). Adjusting questions based on students' responses obtained a mean of 3.23 (SD = 0.698). Meanwhile, adjusting the pace of instruction based on students' responses obtained a mean of 3.20 (SD = 0.576).

These findings suggest that pre-service teachers relatively frequently use information obtained during instruction to monitor students' understanding. However, there appears to be a distinction between collecting information and using it to make more complex pedagogical adaptations. For example, designing tasks for different levels of learning readiness obtained a mean of 3.17 (SD = 0.699), whereas providing tasks that can be completed in different ways obtained a mean of 3.07 (SD = 0.710). This pattern suggests that formative assessment practices are relatively visible at the stage of eliciting evidence of learning, but translating such evidence into differentiated task design is less consistent.

3) Feedback and Instructional Adjustment

Feedback was one of the strongest components of reported practice. Pre-service teachers reported providing feedback that helps students improve, with a mean of 3.43 (SD = 0.500). They also reported adapting feedback to individual student needs (M = 3.30; SD = 0.530) and providing opportunities for students to revise their work based on feedback (M = 3.30; SD = 0.530).

These findings are broadly consistent with the AfL principle that feedback should be integrated into the learning process rather than serving merely as information about whether students' work is correct or incorrect. Providing feedback during learning rather than only at the end obtained a mean of 3.23 (SD = 0.647). The use of varied forms of feedback—oral, written, peer, or digital—obtained a mean of 3.20 (SD = 0.637).

However, adjusting teaching based on frequent student errors obtained a mean of 3.17 (SD = 0.557). This suggests that although feedback provision was relatively strong, the use of information from students' errors to modify instructional strategies or decisions was not reported at the same level. This is important because adaptive formative assessment does not stop at providing feedback but also involves using assessment evidence to adjust instruction.

The negatively worded statement, "I give the same feedback to all students regardless of their needs," obtained a mean of 2.72 (SD = 0.976), one of the lowest means across the entire

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scale. Because this item is negatively worded, the score suggests that uniform feedback practices are still reported by some pre-service teachers. In other words, feedback is a relatively strong area of practice, but the personalization of feedback is not yet fully consistent.

4) Peer Assessment, Student Interaction, and Flexible Grouping

Practices involving student interaction showed a more varied pattern. Pre-service teachers reported involving student–student interaction in the learning process, with a mean of 3.39 (SD = 0.588). Guided group discussions were also relatively frequently used (M = 3.22; SD = 0.618).

However, peer assessment and flexible grouping received lower scores. Teaching students how to provide feedback to their peers obtained a mean of 2.97 (SD = 0.688), while using peer assessment with clear criteria obtained a mean of 2.88 (SD = 0.691). Grouping students flexibly according to their learning needs obtained a mean of 3.07 (SD = 0.710), whereas changing grouping arrangements based on assessment results obtained a mean of 2.92 (SD = 0.766).

This pattern suggests that student interaction is relatively common, but its use as part of formative assessment mechanisms and instructional adaptation is more limited. Thus, pre-service teachers appear to use group work more often as a means of facilitating classroom interaction than as a systematic mechanism for generating and using learning evidence through peer assessment or assessment-informed grouping.

5) Learner Agency, Self-Assessment, and Learning Independence

Practices supporting learner agency showed a relatively high level of implementation but were generally lower than feedback practices. Encouraging students to set their own learning goals obtained a mean of 3.03 (SD = 0.642). Providing tools such as rubrics or checklists to support self-assessment obtained a mean of 2.93 (SD = 0.778). Teaching students to monitor their own learning progress obtained a mean of 3.08 (SD = 0.561), while providing opportunities for students to reflect on their learning obtained a mean of 3.22 (SD = 0.585).

Pre-service teachers also reported adjusting instruction to support student independence (M = 3.24; SD = 0.536) and encouraging students to choose learning strategies that were most suitable for them (M = 3.05; SD = 0.660). The statement, “Students are completely dependent on me to assess their learning,” obtained a mean of 2.81 (SD = 0.861). Because this statement is negatively worded in relation to learner agency, the score suggests that students’ dependence on teachers in the assessment process is still reported to a considerable degree by some pre-service teachers. This is consistent with the pattern observed in other items, which indicates that practices giving students an active role—particularly self-assessment, goal setting, monitoring, and strategy selection—tend to be less frequent than practices directly undertaken by teachers.

Discussion

The findings of this study indicate that, overall, pre-service English teachers reported relatively high levels of conceptual understanding of adaptive formative assessment and also reported relatively high levels of implementation of adaptive formative assessment practices. However, closer examination reveals that this pattern was not uniform across all principles underlying adaptive formative assessment. Participants demonstrated stronger understanding and implementation of teacher-led formative assessment practices, particularly in

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

communicating learning objectives, eliciting evidence of learning, providing feedback, and monitoring students' understanding. In contrast, practices requiring systematic differentiation, flexible grouping, self-assessment and peer assessment, and the strengthening of student agency tended to be reported less consistently. This pattern is important because adaptive formative assessment requires more than the presence of formative assessment techniques; it also involves using evidence of learning to make responsive pedagogical decisions while providing students with opportunities to participate actively in the assessment and learning processes.

1) Conceptual Understanding of Adaptive Formative Assessment

The relatively high scores on most conceptual understanding items indicate that pre-service teachers have developed a generally positive understanding of the basic principles of formative assessment and adaptive teaching. In particular, participants showed strong agreement with the view that formative assessment is an ongoing process of collecting evidence to support learning, that assessment information should be used to inform instructional decisions, and that adaptive teaching involves adjusting instruction according to students' needs. This pattern is broadly consistent with the conceptualization of classroom assessment as an integral part of pedagogy rather than as an activity conducted separately from the learning process (Black & Wiliam, 2018).

These findings are also consistent with previous research suggesting that teachers' understanding of assessment is an important condition for the implementation of assessment reform. Arrafii (2021) showed that Indonesian teachers' conceptions of assessment are associated with how they understand the values and dimensions of assessment practices, while Arrafii (2022) demonstrated that teachers may interpret assessment reform through conceptions that remain influenced by established assessment traditions. Similarly, Dewi and Mutammam (2022) reported that Indonesian EFL teachers face various challenges in implementing formative assessment, particularly under changing learning conditions. Taken together, these studies suggest that holding positive views about formative assessment does not necessarily mean that teachers possess a fully coherent conception of its pedagogical purposes.

This issue is evident in the present study in the responses to several negatively worded conceptual items. Although participants generally understood formative assessment as a process intended to support learning, relatively high responses were also observed for statements indicating that formative assessment is primarily used to assign grades or is conducted at the end of instruction. Similarly, some participants appeared to retain the belief that effective teaching should follow the initial plan without substantial modification and that all students can be taught and assessed in the same way. These responses suggest that participants may simultaneously hold elements of formative/adaptive conceptions and more traditional views of assessment and teaching.

The coexistence of these different conceptions is consistent with the contextual characteristics of assessment reform in Indonesia. Arrafii (2023) showed that the implementation of assessment reform is influenced not only by teachers' knowledge but also by contextual conditions, institutional expectations, established assessment cultures, and other systemic factors. Arrafii (2022) likewise demonstrated how Indonesian teachers negotiate reform ideas with established understandings of the functions of assessment. Therefore, the relatively high descriptive scores found in the present study should not automatically be interpreted as evidence that participants have developed fully mature and

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

internally coherent conceptions of adaptive formative assessment. Rather, the findings suggest an emerging understanding in which reform-oriented principles coexist with more traditional conceptions of assessment and teaching.

2) Reported Practices: Stronger Implementation of Teacher-Led Formative Assessment

The second major finding concerns the instructional practices reported by participants. Participants reported relatively frequent use of several practices associated with Assessment for Learning (AfL), including explaining learning objectives, checking students' understanding, asking questions to elicit evidence of learning, providing feedback, and giving students opportunities to revise their work based on feedback. These findings are broadly consistent with the core principles of AfL, whereby evidence about students' current learning is elicited and subsequently used to support further learning and instructional decision-making (Black & Wiliam, 2018).

The relatively high frequency of reported feedback practices is particularly noteworthy. Participants reported that they frequently provided feedback that helped students improve their work and adjusted feedback according to individual students' needs. This pattern suggests that feedback has become a relatively familiar component of formative assessment practices among pre-service teachers. However, providing feedback and using feedback adaptively are not necessarily the same. The relatively lower score for adjusting instruction in response to frequent student errors suggests that participants may be more accustomed to providing feedback than to using assessment evidence as a basis for broader instructional adjustments.

This distinction is important when considered alongside previous research on EFL teachers in Indonesia. Burhanuddin, Arrafii, and Mahsun (2025) found variation in the types and quality of AfL strategies implemented by Indonesian secondary-school EFL teachers. Their findings suggest that AfL implementation cannot be understood solely in terms of whether a particular strategy is present; the quality and pedagogical purpose of its use are also important. The present findings extend this understanding to pre-service teachers by suggesting that relatively frequent use of formative techniques may coexist with more limited use of assessment evidence to redesign or substantially adjust instruction.

These findings are also relevant to the distinction between formative assessment as a collection of techniques and formative assessment as a pedagogical process. Teachers may ask questions, provide feedback, or communicate learning objectives without necessarily using the evidence generated to make adaptive instructional decisions. From this perspective, the relatively high frequency of reported practices should be considered alongside the lower scores for practices involving more substantive adaptation, such as changing student grouping based on assessment results or designing different tasks for students with different levels of readiness.

3) Adaptive Teaching and Differentiation: From Responsiveness to Systematic Adaptation

The findings further indicate that participants reported more adaptation of instruction at the micro level than systematic forms of differentiation. For example, participants relatively frequently reported changing how learning objectives were explained when students did not understand, adjusting questions based on students' responses, and adapting feedback. These practices demonstrate responsiveness during classroom interactions and are consistent with principles of adaptive teaching.

However, practices related to systematic differentiation received relatively lower scores. Designing tasks according to different levels of student readiness, providing multiple

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ways for students to demonstrate their learning, grouping students flexibly, and changing groups based on assessment results were reported less frequently. This finding is important because adaptive teaching does not simply mean providing momentary responses to students; it also involves responding to learner differences through pedagogical decisions concerning instructional approaches, tasks, grouping, pacing, and forms of support. Differentiation therefore requires not only occasional modifications during classroom interactions but may also involve deliberate planning and adjustment to accommodate differences among learners (Tomlinson, 2017).

This finding is consistent with the Indonesian context discussed by Arrafii and Suadiyatno (2024), who identified both prospects and challenges associated with differentiated assessment in EFL classrooms. Differentiated assessment requires teachers to consider differences in learner characteristics and design assessment opportunities that generate meaningful evidence of learning without reducing assessment to a uniform procedure. The relatively lower scores for differentiated tasks and flexible grouping in the present study may indicate that pre-service teachers have begun to recognize learner diversity conceptually but may still have limited opportunities or experience to translate this understanding into systematic classroom practices.

Pujiani, Sukmawati, and Indrasari (2022) likewise emphasized the importance of teacher readiness in responding to changes in the paradigm of English language teaching. Their study showed that transitioning toward a new paradigm in ELT requires more than awareness of reform principles; teachers need the knowledge and readiness to translate these principles into instructional practice. The findings of the present study support this argument by showing that participants possessed relatively strong general understanding, while the implementation of more complex aspects of adaptive pedagogy remained less consistent.

4) Student Agency and the Limitations of Teacher-Centred Formative Assessment

One important finding of this study concerns the role of students in the assessment process. Participants demonstrated relatively strong conceptual understanding of student responsibility, goal setting, self-assessment, and peer assessment. However, the frequency of practices operationalizing these principles was comparatively lower. For example, encouraging students to set their own learning goals, providing rubrics or checklists for self-assessment, teaching students to monitor their own progress, and using peer assessment with clear criteria were among the practices reported less frequently.

This discrepancy suggests that participants may understand student agency as an important principle without consistently creating pedagogical conditions that enable students to exercise that agency. This issue is particularly relevant to formative assessment because student agency is not merely an outcome of assessment; it can also be developed through students' active involvement in setting goals, interpreting evidence, monitoring progress, evaluating their work, and determining subsequent steps for improvement.

This finding is consistent with research by Arrafii and Burhanuddin on student agency in the context of curriculum reform in Indonesia. Burhanuddin and Arrafii (2023) demonstrated that student agency is influenced by how teachers interpret and implement curriculum reform within existing educational structures. In the present study, the relatively lower frequency of self-assessment, peer assessment, and student-directed goal setting may suggest that teacher-centred assessment orientations continue to exert an influence, even though pre-service teachers conceptually support principles of student responsibility.

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This finding is also consistent with Arrafii (2022), who showed that Indonesian teachers' conceptions of assessment are embedded within broader cultural and institutional expectations. When teachers traditionally understand assessment as something conducted by teachers to evaluate students, shifting toward assessment that enables students themselves to generate, interpret, and use evidence of learning represents a substantial pedagogical change. Therefore, the relatively limited use of self-assessment and peer assessment may reflect not only limitations in technical knowledge but also the persistence of established conceptions of the teacher as the primary authority in assessment.

5) Implications for Pre-Service Teacher Education

The findings of this study have several implications for pre-service teacher education. First, teacher education programmes need to move beyond introducing formative assessment and adaptive teaching as two separate areas of knowledge. Instead, teacher education programmes should explicitly demonstrate how evidence generated through formative assessment can serve as a basis for concrete instructional adjustments. For example, pre-service teachers could be asked to interpret hypothetical or authentic assessment evidence and subsequently design alternative instructional responses for students with different learning needs.

Second, teacher education needs to place greater emphasis on the quality and purpose of feedback rather than simply increasing the frequency of feedback provision. Pre-service teachers need opportunities to distinguish between feedback that merely communicates information about performance and feedback that provides actionable information to support subsequent learning. This emphasis is consistent with the central role of feedback in formative assessment (Black & Wiliam, 2018) and with the findings of this study, which indicate that feedback provision was relatively strong, whereas its use to inform instructional adjustments was more limited.

Third, the findings highlight the need to strengthen pre-service teachers' competence in differentiated assessment and adaptive instructional design. Tomlinson (2017) emphasises the importance of responding to differences in students' readiness, interests, and learning profiles. In the EFL context, this can be achieved through designing tasks with different levels of complexity, providing alternative ways for students to demonstrate their learning, varying scaffolding, and using assessment evidence to inform grouping and subsequent instruction. Arrafii and Suadiyatno (2024) likewise emphasise the importance of developing assessment practices that are responsive to learner diversity in Indonesian EFL classrooms.

Finally, teacher education programmes need to provide more opportunities for pre-service teachers to experience assessment as a process that actively involves students. The relatively low frequency of self-assessment, peer assessment, goal setting, and learning monitoring suggests that these practices need to be systematically integrated into pre-service teacher education. Such experiences may help pre-service teachers move beyond viewing assessment primarily as a teacher responsibility towards understanding assessment as a shared process that can strengthen student agency. This is particularly relevant given the importance of student agency in curriculum reform in Indonesia (Burhanuddin & Arrafii, 2023).

Limitations

Several limitations should be considered when interpreting the findings. First, the study involved a small convenience sample of 60 pre-service English teachers. Although this sample was suitable for an initial pilot investigation, it limits the precision and

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Vol.4, No.2 (October – 2026)
E-ISSN: 2987-4343
pp. 96-117

generalizability of the descriptive findings. The results may reflect the characteristics and experiences of the participants rather than broader patterns among pre-service English teachers. The study was also conducted within a single teacher education program, which restricts the extent to which the findings can be transferred to programs with different curricula, practicum arrangements, and approaches to assessment education.

Second, the study relied on self-reported practices rather than direct observations of classroom assessment. Participants' responses therefore represent their perceptions of their own practices and may not fully correspond to their actual instructional behavior. Responses may also have been influenced by social desirability or participants' interpretations of the questionnaire items. Consequently, the reported levels of practice should not be treated as direct evidence of demonstrated competence in implementing adaptive formative assessment.

Third, the instrument remains at a preliminary stage of development and evaluation. Although the questionnaire was designed to assess conceptual understanding and reported practices across relevant dimensions of adaptive formative assessment, the present pilot survey was primarily descriptive and did not establish comprehensive evidence of its reliability, construct validity, or measurement structure. The findings should therefore not be interpreted as definitive evidence that the instrument provides a fully validated measure of adaptive formative assessment. Further psychometric evaluation is needed to determine whether the items adequately represent the intended constructs and whether the proposed dimensions can be empirically distinguished.

Finally, the cross-sectional, descriptive design limits the conclusions that can be drawn about the relationship between conceptual understanding and reported practices. The observed patterns may suggest areas of alignment and potential gaps, but they do not establish that conceptual understanding translates into practice or explain the factors underlying differences in reported practice levels. Future studies should address these limitations through multi-site sampling, more rigorous instrument validation, and the triangulation of self-report measures with observational and qualitative evidence. Longitudinal or intervention-based designs could further investigate how coursework, teaching practicum, and targeted professional learning contribute to the development of adaptive formative assessment practices over time.

Conclusion

This pilot study explored pre-service English teachers' conceptual understanding and self-reported practices of adaptive formative assessment. The findings indicate that participants generally reported high to very high levels of conceptual understanding and practice, particularly in communicating learning objectives, checking students' understanding, providing feedback, and adjusting instruction in response to learning needs. However, comparatively lower reported levels of peer assessment, self-assessment, flexible grouping, differentiated assessment, and practices supporting learner agency point to areas that warrant greater attention in teacher education. These findings suggest that although pre-service teachers may demonstrate a positive conceptual orientation toward adaptive formative assessment, opportunities to enact its more participatory and differentiated dimensions may require further development.

The study contributes preliminary evidence concerning how adaptive formative assessment is understood and reportedly enacted by pre-service English teachers in a teacher education context. By examining conceptual understanding and reported practices together, it

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provides an initial descriptive basis for identifying potential priorities in teacher preparation, particularly the integration of instructional adaptation, student participation, and learner agency into assessment-related coursework and teaching practicum. Nevertheless, the findings should be interpreted as indicative rather than conclusive, given the exploratory nature of the study and the limitations of its sample and measurement approach.

Recommendations

Future research should extend this initial investigation through larger and more diverse samples of pre-service and in-service teachers across multiple teacher education programs and institutional contexts. An important next step is to evaluate the instrument's measurement properties through systematic item analysis and appropriate reliability and validity assessments, including examination of its factor structure with a sufficiently large sample. Subsequent studies should also combine questionnaire data with classroom observations, lesson plans, assessment artifacts, and interviews to examine whether reported practices correspond with teachers' actual assessment decisions. Such research would help establish a more robust empirical foundation for assessing adaptive formative assessment and inform teacher education approaches that support systematic instructional adaptation and meaningful student participation.

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