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# Effect of Formative Assessment Practices and Feedback Quality on Learning Outcomes at Secondary Level

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**ABSTRACT**
*Formative assessment practices and feedback quality play a critical role in enhancing learning outcomes by continuously monitoring students' understanding and providing timely, constructive guidance for improvement. When effectively implemented, these practices support deeper engagement, clarify learning goals, and enable students to actively use feedback to improve their academic performance. The objectives of the study were a) to find the level of Formative Assessment Practices, Feedback Quality and Learning Outcomes at secondary level, b) to analyze the effect of Formative Assessment Practices and Feedback Quality on Learning Outcomes at secondary level, c) to examine the correlation among Formative Assessment Practices, Feedback Quality, Learning Outcomes at secondary level. A quantitative approach was used. Primary sources provided the data for the current study. Every secondary school in the Kasur district (public and private) was used to sample the population. The study's instrument was a questionnaire. Descriptive statistics (mean and S.D.) and Inferential statistics (linear regression and Pearson r) were used to achieve the objectives. The regression analysis revealed that formative assessment practices and feedback quality jointly have a significant and meaningful effect on learning outcomes at the secondary level, explaining 30.1% of the variance in students' academic performance, with feedback quality emerging as the stronger predictor. The correlation results showed significant positive relationships among formative assessment practices, feedback quality, and learning outcomes, indicating that effective formative assessment is associated with higher-quality feedback, which in turn is linked to improved student learning outcomes. It is recommended that secondary school teachers receive targeted professional development focused on enhancing feedback quality within formative assessment practices, particularly emphasizing timely, specific, and actionable feedback that clearly guides students on how to improve their learning outcomes.*

***Keywords***: *Formative Assessment Practices, Feedback Quality, Learning Outcomes, secondary level*

## Introduction

In contemporary educational landscapes, the pursuit of improved student learning outcomes remains a paramount objective for educators, policymakers, and researchers alike. Among the instructional strategies identified as pivotal for enhancing academic achievement, formative assessment practices and feedback quality have emerged as essential components of effective teaching and learning processes (Black & Wiliam, 2022; OECD, 2025). Formative assessment is broadly defined as the ongoing process of gathering evidence about student understanding for the explicit purpose of adjusting instruction and supporting learning progress (Black & Wiliam, 2022). Unlike summative assessment, which typically occurs at the

end of instructional units to evaluate student achievement, formative assessment is continuous, dynamic, and directly embedded within instructional practice (Hernandez & Yang, 2023). Feedback, as a subset of formative assessment, refers to information provided by teachers (or peers) about students' performance relative to learning goals, with the intent of guiding future performance (Tofail & Malik, 2025). High quality feedback not only informs students about what has been achieved but also clarifies what needs to be done to improve, thus fostering learners' self-regulatory capabilities (Ajmal, Basit, & Sadaf, 2024). As schools around the world adopt more student-centered pedagogies, formative assessment and feedback mechanisms are increasingly seen as drivers of deeper cognitive engagement, motivation, and academic resilience (OECD, 2025; Foster, 2024).

However, despite broad theoretical support, the implementation of formative assessment and feedback quality varies significantly across contexts, particularly at the secondary level where subject complexity and learner autonomy intersect (Alordiah, 2025; Shi, Li, & Xing, 2025). This discrepancy raises critical questions about the effectiveness, equity, and consistency of these practices in enhancing students' learning outcomes. The current study contributes to this growing empirical base by examining how formative assessment practices and feedback quality predict learning achievements among secondary students (Kausar, & Haroon, 2022). Formative assessment has been theorized as a cornerstone of effective instruction since seminal works by Black and Wiliam (1998), but recent research continues to reaffirm its significance across diverse educational settings. Formative assessment practices encompass a range of instructional activities, including clarifying learning intentions, eliciting student understanding, providing diagnostic feedback, and adjusting teaching based on evidence of learning (Sadler, 2023; OECD, 2025). Contemporary meta-analyses indicate that when these practices are systematically implemented, they yield significant gains in student achievement, particularly in literacy, mathematics, and science disciplines (Foster, 2024; Wang et al., 2025).

In their systematic review, Foster (2024) found that formative assessment interventions consistently led to measurable improvements in student outcomes, with effect sizes ranging from moderate to large across secondary contexts. These interventions commonly involved frequent checks for understanding, use of formative tasks, and responsive teaching adjustments informed by student data. Similarly, Wang, Yan, and Tang (2025) demonstrated that formative assessment practices positively influenced students' meta cognitive awareness and learning engagement, which in turn contributed to enhanced performance on standardized assessments (Kausar, Ghazala, & Jan, 2023). Despite these positive associations, several studies underscore that the effectiveness of formative assessment is contingent on quality and intentionality (Kausar, 2025). According to Alordiah (2025), teacher proficiency in embedding formative assessment requires not only technical skills but also conceptual understanding of learning progressions and student misconceptions. In many secondary classrooms, formative assessment tends to become routine or superficial focusing on compliance rather than diagnostic intent thereby limiting its impact on outcomes (Shi et al., 2025). For instance, teachers may administer quizzes or ask questions without systematically using the resulting information to tailor instruction, which diminishes the potential for meaningful learning gains (Hernandez & Yang, 2023; Kausar, & Abid, 2025).

Feedback is widely recognized as one of the most potent influences on learning when it is of high quality meaning it is timely, specific, actionable, and aligned with clear learning goals (Shute, 2022; OECD, 2025). Effective feedback provides learners with clear indicators of strengths and areas for improvement, as well as guidance on strategies to close performance

gaps (Ajmal et al., 2024). In contrast, low quality feedback characterized by general praise, delayed delivery, or vague comments can confuse students or reinforce misconceptions, thereby hindering academic progress (Alordiah, 2025; Tofail & Malik, 2025). Empirical research underscores the centrality of high-quality feedback in shaping learning outcomes. In a multi-site study of secondary schools, Tofail and Malik (2025) found that students who received specific, criterion referenced feedback outperformed peers who received generic or evaluative comments, particularly in subjects requiring higher order thinking. Similarly, Ajmal et al. (2024) reported that feedback that included next step guidance significantly predicted improvements in student performance, even after accounting for prior achievement levels.

Feedback quality also plays a mediating role between formative assessment and learning outcomes. According to OECD (2025), formative assessment generates data about student understanding, but feedback translates this data into actionable messages that students can use to improve. Without this translation, assessment information remains inert and fails to influence learning trajectories. This mediating function has been documented across diverse educational contexts, with several studies showing that formative assessment practices yield stronger effects when paired with high quality feedback (Foster, 2024; Woitt, Rahman, & Chen, 2025). Recent research also positions feedback as a key driver of student self-regulated learning (SRL) the process by which learners set goals, monitor progress, and adapt strategies to achieve academic success (Faza & Lestari, 2025; OECD, 2025). When feedback is designed to promote reflection, self-assessment, and strategic adjustment, students are more likely to internalize learning goals and sustain productive learning behaviors (Tofail & Malik, 2025). For example, Faza and Lestari (2025) demonstrated that feedback practices emphasizing metacognitive questions (e.g., “What strategy helped you most on this task?”) enhanced students’ ability to regulate their own learning processes, which was reflected in improved performance on subsequent assignments. This aligns with broader theoretical frameworks that view feedback as not just corrective but formative in a cognitive and motivational sense, enabling learners to build autonomy and resilience in the face of academic challenges (Shute, 2022; Woitt et al., 2025).

Despite robust evidence supporting formative assessment and feedback, research also highlights persistent implementation challenges, particularly in secondary schools. Secondary teachers often face constraints such as large class sizes, limited instructional time, and curriculum pressure, all of which impede the routine use of high-quality formative assessment and feedback practices (Alordiah, 2025; Hernandez & Yang, 2023). Additionally, many teachers report insufficient professional development focused on assessment literacy, leaving them underprepared to interpret formative data or craft high impact feedback (Shi et al., 2025). The cultural context of assessment practices also matters. In some educational systems, summative accountability pressures dominate instructional priorities, leading to a marginalization of formative strategies that are perceived as less relevant to standardized testing outcomes (Foster, 2024). This tension can inadvertently limit opportunities for genuine formative assessment and high-quality feedback, particularly in contexts where exam performance is highly valued (Ndlovu, 2025; Goertzen, Heeneman, & Schils, 2025; Wondim, & Dessie, 2025; Arroyo, et al., 2025)

Nevertheless, innovative interventions demonstrate that such barriers are not insurmountable. Professional learning communities, embedded coaching, and technology enhanced assessment tools have been shown to improve teachers’ formative assessment skills and feedback practices, resulting in measurable gains in student outcomes (Wang et al., 2025; OECD, 2025). For example, digital platforms that provide real time analytics and

scaffolded feedback prompts help teachers manage the complexity of formative assessment in large classrooms, thereby increasing instructional responsiveness and student engagement (Wang et al., 2025). The literature compellingly demonstrates that formative assessment practices and feedback quality are integral to enhancing learning outcomes at the secondary level. When thoughtfully implemented, formative assessment supports continuous instructional adjustment, while high quality feedback bridges the gap between performance and improvement. Furthermore, feedback that fosters self-regulatory processes enhances not only achievement but also students' capacity to learn independently. However, effective implementation depends on teacher expertise, systemic support, and alignment with instructional goals. This body of research provides a robust foundation for the present study's investigation into how these practices function within secondary classrooms and affirms their significance in fostering meaningful student learning.

**Objectives of the Study**

1. To find the level of Formative Assessment Practices, Feedback Quality and Learning Outcomes at secondary level.
2. To analyze the effect of Formative Assessment Practices and Feedback Quality on Learning Outcomes at secondary level.
3. To examine the correlation among Formative Assessment Practices, Feedback Quality, Learning Outcomes at secondary level.

**Research Design and Methodology**

A quantitative research approach was employed to examine the effect of formative assessment practices and feedback quality on learning outcomes at the secondary level. The study relied on primary data sources, with data collected through a structured questionnaire. The population of the study comprised students enrolled in public and private secondary schools in Kasur District. According to official records, Kasur District has 233 public secondary schools with 1,181 teachers (School Information System, SIS, 2025) and 713 private secondary schools employing 2,852 teachers (Punjab Education Private Regulatory Information System, PEPRIS, 2022). A multistage sampling technique was adopted to ensure adequate representation of both school sectors and geographical coverage. In the first stage, stratified sampling was used to divide the population into two strata: public and private secondary schools. In the second stage, cluster sampling was applied by categorizing the district into four administrative clusters (Tehsils). From each cluster, schools were selected using a simple random sampling technique, resulting in the selection of 10 public and 25 private secondary schools per cluster. In the final stage, students were randomly selected from the chosen schools, yielding a total sample of 750 students. This sampling strategy enhanced the representativeness and generalizability of the findings.

The research instrument was a self-administered questionnaire adapted from established and widely used scales. Items measuring formative assessment practices were adapted from the work of Black and Wiliam (1998) and Wiliam (2011), feedback quality items were derived from Hattie and Timperley (2007), and learning outcomes were measured using constructs informed by Biggs and Tang (2011) and Bloom's (1956) taxonomy of educational objectives. The questionnaire used a five-point Likert scale ranging from strongly agree to strongly disagree. Content and face validity of the instrument were established through expert review by specialists in education and assessment, ensuring clarity, relevance, and alignment with the study objectives. A pilot study was conducted to assess the reliability of the instrument, and internal consistency was confirmed using Cronbach's alpha. The overall reliability coefficient of the questionnaire was found to be 0.887, indicating a high level of reliability.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics, including mean scores and standard deviations, were used to describe the main variables, while inferential statistics specifically Pearson correlation and multiple linear regression were employed to examine relationships and determine the predictive effects of formative assessment practices and feedback quality on learning outcomes. This analytical approach enabled a comprehensive examination of both associative and predictive dimensions of the study variables.

**Data Analysis and Interpretations**

Table 1

*Description of main variables*

| Variables | N | Mean | S.D. |
|---|---|---|---|
| Formative Assessment Practices | 750 | 2.1705 | .43882 |
| Feedback Quality | 750 | 2.2182 | .42388 |
| Learning Outcomes | 750 | 2.1403 | .41670 |
| Valid N (listwise) | 750 | | |

(Strongly agree=1 to Strongly disagree=5)

Table 1 presents the descriptive statistics for the main variables of the study Formative Assessment Practices, Feedback Quality, and Learning Outcomesbased on a sample of 750 participants. The mean score for Formative Assessment Practices is 2.1705 (SD = 0.43882), indicating that, on average, participants moderately agreed with the statements reflecting the use of formative assessment strategies in their learning environment. Feedback Quality shows a slightly higher mean of 2.2182 (SD = 0.42388), suggesting that participants perceive feedback as generally constructive and timely, with a moderate level of agreement. Learning Outcomes have a mean score of 2.1403 (SD = 0.41670), implying that students moderately recognize the achievement of intended learning outcomes. Overall, the relatively low standard deviations across all variables reflect consistency in responses and limited variability among participants, which indicates a shared perception regarding the implementation of formative assessment practices, the quality of feedback provided, and the attainment of learning outcomes. Given the Likert scale coding (1 = Strongly Agree to 5 = Strongly Disagree), the mean values near 2 suggest a generally positive evaluation of the teaching and learning processes, highlighting that formative assessment and feedback mechanisms are perceived as contributing meaningfully to student learning outcomes.

**Formative Assessment Practices**

Table 2

*Description of Formative Assessment Practices*

| Items | Mean | S.D. |
|---|---|---|
| **The teacher clearly explains lesson objectives before teaching.** | 1.92 | .967 |
| **The teacher checks students' understanding during the lesson.** | 1.87 | .851 |
| **The teacher asks questions to see if students are learning.** | 1.88 | .885 |
| **The teacher uses short quizzes during lessons.** | 2.05 | .948 |
| **The teacher changes teaching based on students' responses.** | 2.08 | .911 |
| **Students are asked to assess their own work.** | 2.17 | 1.041 |
| **Students assess each other's work.** | 2.32 | 1.115 |
| **The teacher uses class activities to monitor progress.** | 2.16 | 1.133 |
| **Mistakes are used as learning opportunities.** | 2.36 | 1.149 |
| **Assessment is used to improve learning, not just grading.** | 2.31 | 1.067 |

(Strongly agree=1 to Strongly disagree=5)

Table 2 presents the descriptive statistics for various formative assessment practices as reported by teachers or observed in classrooms, using a 5-point Likert scale where 1 indicates "Strongly Agree" and 5 indicates "Strongly Disagree." The results suggest that, overall, teachers moderately implement formative assessment strategies in their instructional practices. Items related to clarifying lesson objectives (M = 1.92, SD = 0.967) and checking students' understanding during lessons (M = 1.87, SD = 0.851) received the lowest mean scores, indicating that teachers generally agree that these practices are consistently applied. In contrast, practices that involve student-centered assessment, such as students assessing their own work (M = 2.17, SD = 1.041) and peer assessment (M = 2.32, SD = 1.115), received slightly higher mean scores, indicating less frequent implementation. Similarly, using mistakes as learning opportunities (M = 2.36, SD = 1.149) and framing assessment primarily to improve learning rather than grading (M = 2.31, SD = 1.067) also received higher means, suggesting that while formative principles are recognized, their full student-centered application is still developing. Furthermore, items reflecting adaptive teaching based on assessment feedback, such as changing teaching based on students' responses (M = 2.08, SD = 0.911) and using class activities to monitor progress (M = 2.16, SD = 1.133), indicate moderate application. This demonstrates that teachers are somewhat responsive to student learning but may require additional training or support to systematically integrate formative feedback into daily instruction.

**Feedback Quality**

Table 3

*Description of Feedback Quality*

| Items | Mean | S.D. |
|---|---|---|
| **Feedback is clear and easy to understand.** | 2.22 | 1.002 |
| **Feedback is given on time.** | 2.46 | 1.143 |
| **Feedback explains what I did well.** | 2.37 | 1.122 |
| **Feedback tells me how to improve.** | 2.17 | 1.025 |
| **Feedback is related to learning objectives.** | 2.24 | 1.101 |
| **Feedback motivates me to do better.** | 2.21 | 1.041 |
| **Feedback is specific, not general.** | 2.28 | 1.065 |
| **Feedback helps me correct my mistakes.** | 2.21 | 1.017 |
| **Feedback is respectful and encouraging.** | 2.21 | 1.029 |
| **Feedback helps me plan my next steps.** | 2.18 | 1.014 |

(Strongly agree=1 to Strongly disagree=5)

Table 3 presents descriptive statistics for students' perceptions of feedback quality across ten key dimensions, using a 5-point Likert scale where 1 indicates "Strongly Agree" and 5 indicates "Strongly Disagree." Overall, the mean scores for all items range between 2.17 and 2.46, suggesting that students generally perceive the feedback provided in their learning environment as moderately positive, with tendencies toward agreement rather than strong disagreement. The lowest mean score (2.17) was observed for items assessing whether feedback tells students how to improve and helps them plan their next steps, indicating that while feedback is somewhat constructive, there may be room for enhancing its actionable and forward-looking guidance. The highest mean score (2.46) corresponds to the timeliness of feedback, implying that students perceive a slight delay in receiving feedback relative to their expectations. Standard deviations for all items range from 1.014 to 1.143, reflecting moderate variability in responses and suggesting that students' experiences with feedback quality are somewhat diverse, though not highly inconsistent. Collectively, these results

indicate that while feedback is generally perceived as clear, specific, respectful, and moderately motivating, there is potential for improvement in making feedback timelier, targeted toward actionable improvement, and explicitly connected to students' next learning steps. These insights underscore the importance of designing feedback practices that not only communicate strengths and areas for improvement but also actively guide students in planning and enhancing their learning trajectories.

**Learning Outcomes**

Table 4

*Description of Learning Outcomes*

| Items | Mean | S.D. |
|---|---|---|
| **I understand the topics taught in class.** | 2.17 | 1.050 |
| **I can apply what I learn in exams.** | 2.19 | 1.085 |
| **My academic performance has improved.** | 2.14 | 1.114 |
| **I can solve problems related to the subject.** | 2.36 | 1.213 |
| **I remember important concepts after lessons.** | 2.21 | 1.091 |
| **I can explain the lesson to others.** | 2.35 | 1.170 |
| **I perform well in tests and assignments.** | 2.22 | 1.103 |
| **I can use knowledge in new situations.** | 2.12 | 1.035 |
| **My learning goals are being achieved.** | 2.09 | 1.113 |
| **Overall, my learning has improved.** | 2.22 | 1.087 |

(Strongly agree=1 to Strongly disagree=5)

Table 4 presents the descriptive statistics for students' self-reported learning outcomes across ten items, measured on a 5-point Likert scale (1 = Strongly Agree, 5 = Strongly Disagree). The mean scores for all items range from 2.09 to 2.36, indicating that, on average, participants moderately agree that their learning outcomes have improved as a result of the instructional experiences. The lowest mean score (M = 2.09) corresponds to the item "My learning goals are being achieved," suggesting that students perceive a relatively higher level of progress toward goal attainment, whereas the highest mean (M = 2.36) is observed for "I can solve problems related to the subject," highlighting a slightly lower confidence in applying knowledge to problem-solving contexts. The standard deviations, ranging from 1.035 to 1.213, indicate moderate variability in responses, reflecting differences in individual students' experiences and perceptions of learning. Notably, items related to knowledge application ("I can apply what I learn in exams," M = 2.19) and knowledge transfer to new situations ("I can use knowledge in new situations," M = 2.12) show slightly higher agreement than items assessing performance outcomes, suggesting that students recognize both the acquisition of conceptual understanding and its practical application. Overall, the descriptive patterns suggest that students perceive a meaningful, albeit moderate, enhancement in both cognitive and performance-related learning outcomes. The consistency across items demonstrates that interactive or structured learning strategies may be contributing to improvements in comprehension, application, problem-solving, and the ability to communicate and generalize knowledge.

Table 5

*Relationship among Formative Assessment Practices, Feedback Quality and Learning Outcomes at secondary level*

| Correlations | | | | |
|---|---|---|---|---|
| | | Formative Assessment Practices | Feedback Quality | Learning Outcomes |
| Formative Assessment Practices | Pearson Correlation | 1 | .352** | .401** |
| | Sig. (2-tailed) | | .000 | .000 |
| | N | 750 | 750 | 750 |
| Feedback Quality | Pearson Correlation | .352** | 1 | .492** |
| | Sig. (2-tailed) | .000 | | .000 |
| | N | 750 | 750 | 750 |
| Learning Outcomes | Pearson Correlation | .401** | .492** | 1 |
| | Sig. (2-tailed) | .000 | .000 | |
| | N | 750 | 750 | 750 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | |

Table 5 presents the Pearson correlation coefficients examining the relationships among formative assessment practices, feedback quality, and learning outcomes at the secondary level. The results indicate that formative assessment practices are positively and significantly correlated with feedback quality ($r = 0.352$, $p < 0.01$) and learning outcomes ($r = 0.401$, $p < 0.01$). This suggests that teachers who consistently implement formative assessment strategies tend to provide higher-quality feedback, which in turn is associated with improved student learning outcomes. Similarly, feedback quality shows a moderate positive correlation with learning outcomes ($r = 0.492$, $p < 0.01$), indicating that students who receive clear, timely, and constructive feedback are more likely to achieve higher academic performance. The significant correlations at the 0.01 level underscore the robustness of these relationships and suggest that formative assessment and feedback are interrelated components that collectively support students' learning processes. Overall, these findings provide empirical evidence for the theoretical assertion that effective formative assessment practices, mediated through high-quality feedback, are critical predictors of student learning outcomes. The moderate strength of the observed relationships highlights that while assessment and feedback are influential, other contextual and instructional factors may also contribute to student achievement, warranting further investigation.

Table 6

*Effect of Formative Assessment Practices and Feedback Quality on Learning Outcomes at secondary level*

| Model Summary[b] | | | | |
|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .548[a] | .301 | .299 | .34890 |
| a. Predictors: (Constant), Feedback Quality, Formative Assessment Practices | | | | |
| b. Dependent Variable: Learning Outcomes | | | | |

Table 6 presents the Model Summary for the regression analysis assessing the effect of Formative Assessment Practices (FAP) and Feedback Quality (FQ) on Learning Outcomes at the secondary level. The correlation coefficient ($R = 0.548$) indicates a moderate to strong positive relationship between the predictors (FAP and FQ) and the dependent variable (Learning Outcomes). The $R^2$ value of 0.301 suggests that approximately 30.1% of the variance in students' learning outcomes can be collectively explained by formative assessment

practices and feedback quality. The adjusted $R^2$ (0.299) confirms the robustness of this predictive relationship after accounting for the number of predictors and sample size. The standard error of the estimate (0.34890) indicates the average deviation of observed learning outcomes from the predicted values, reflecting a reasonable fit of the model. Overall, this model summary demonstrates that formative assessment and feedback quality are meaningful predictors of student achievement at the secondary level.

Table 7

*Effect of Formative Assessment Practices and Feedback Quality on Learning Outcomes at secondary level*

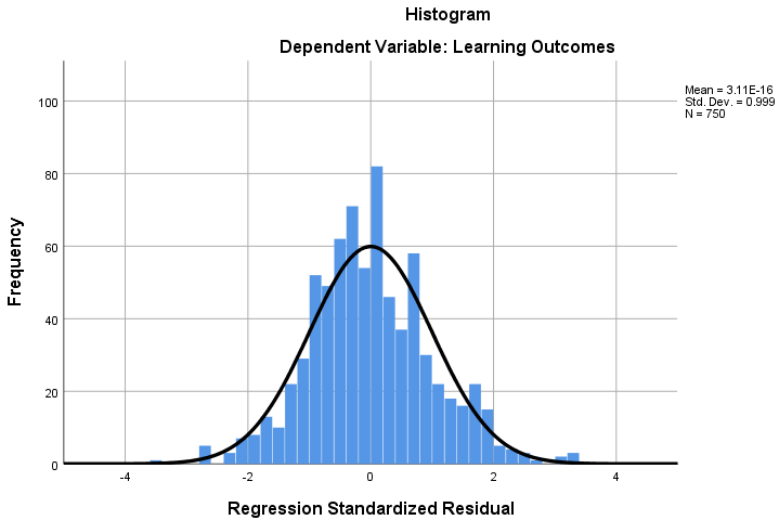
| **ANOVA[a]** | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 39.126 | 2 | 19.563 | 160.709 | .000[b] |
| | Residual | 90.932 | 747 | .122 | | |
| | Total | 130.057 | 749 | | | |
| a. Dependent Variable: Learning Outcomes | | | | | | |
| b. Predictors: (Constant), Feedback Quality , Formative Assessment Practices | | | | | | |

Table 7 provides the ANOVA results evaluating the overall significance of the regression model. The F-value of 160.709 with a significance level of $p < 0.001$ indicates that the regression model is statistically significant. This demonstrates that, together, formative assessment practices and feedback quality significantly predict learning outcomes among secondary-level students. The regression sum of squares (39.126) reflects the portion of variance in learning outcomes explained by the predictors, whereas the residual sum of squares (90.932) represents the unexplained variance. These results confirm that the model provides a significant and reliable explanation of students' academic performance, validating the importance of incorporating both effective formative assessment and high-quality feedback in secondary education settings.

Table 8

*Effect of Formative Assessment Practices and Feedback Quality on Learning Outcomes at secondary level*

| **Coefficients[a]** | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .732 | .080 | | 9.151 | .000 |
| | Formative Assessment Practices | .247 | .031 | .260 | 7.951 | .000 |
| | Feedback Quality | .393 | .032 | .400 | 12.243 | .000 |
| a. Dependent Variable: Learning Outcomes | | | | | | |



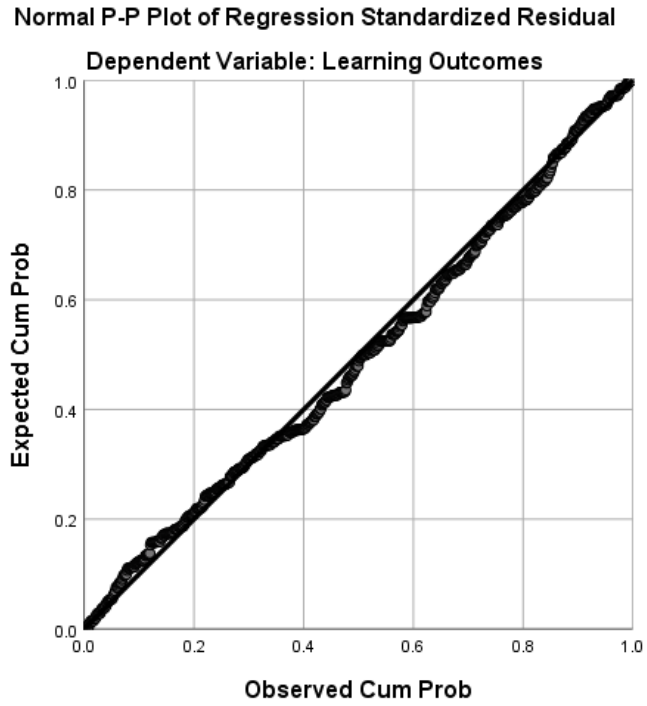




Table 8 presents the detailed contribution of each predictor variable to learning outcomes. The unstandardized coefficients indicate that for every one-unit increase in formative assessment practices, learning outcomes increase by 0.247 units, holding feedback quality constant ($p < 0.001$). Similarly, for every one-unit increase in feedback quality, learning outcomes increase by 0.393 units, holding formative assessment practices constant ($p < 0.001$). The standardized coefficients (Beta) indicate that feedback quality ($\beta = 0.400$) has a stronger influence on learning outcomes compared to formative assessment practices ($\beta = 0.260$), highlighting its relatively greater impact in enhancing student achievement. The constant ($B = 0.732$, $p < 0.001$) represents the expected level of learning outcomes when both predictors are zero. These results collectively indicate that both formative assessment

practices and feedback quality significantly and positively contribute to students' academic performance, with feedback quality emerging as the more influential factor.

**Discussion**

The descriptive results of the current study indicate that secondary school students moderately agree that formative assessment practices and feedback quality are implemented in their learning environments, with mean scores near the agree range on a 5-point Likert scale. These findings are consistent with recent educational research which highlights that formative assessment is generally perceived positively by students and teachers and contributes to improved instructional processes and learner engagement (Tofail & Malik, 2025; Ajmal, Basit, & Sadaf, 2024). The moderate implementation of practices such as clarifying objectives, checking understanding, and using adaptive teaching aligns with systematic reviews showing formative assessment's role in shaping classroom interaction and continuous monitoring of student progress (Foster, 2024; Alordiah, 2025). Correlation findings from Table 5 demonstrated that formative assessment practices are significantly associated with both feedback quality and learning outcomes, while feedback quality has a stronger association with learning outcomes than do assessment practices alone. This pattern supports emergent evidence suggesting that feedback quality is a crucial mediator between assessment practices and student performance. For example, research in secondary contexts has shown that effective and timely feedback significantly improves student outcomes, creating an interactive loop that enhances learning (Tofail & Malik, 2025). Moreover, systematic reviews on formative assessment emphasize that feedback that is specific, actionable, and connected to learning goals leads to higher student engagement, motivation, and achievement (OECD, 2025; Innovative Research Journal of Education, 2025). These studies collectively affirm the importance of feedback quality as not merely a by product of assessment but a core mechanism driving learning improvements.

The regression analysis further reinforces the predictive influence of both formative assessment practices and feedback quality on learning outcomes. The model explained approximately 30.1% of the variance in learning outcomes, indicating that these instructional constructs are significant and meaningful predictors of academic performance. Notably, feedback quality emerged as a stronger predictor ($\beta = 0.400$) than formative assessment practices ($\beta = 0.260$). This finding corroborates recent empirical work that distinguishes the differential influence of feedback elements: while assessment structures are necessary for monitoring progress, the quality and clarity of feedback ultimately determine how effectively students can act on that information to improve performance (OECD, 2025; Tofail & Malik, 2025). Indeed, studies conducted in secondary and higher education settings have highlighted the central role of high-quality feedback in helping learners interpret assessment information and translate it into improved task performance (Ajmal, Basit, & Sadaf, 2024; Woitt et al., 2025).

Beyond the direct effects on quantitative outcomes, contemporary literature emphasizes that formative assessment and feedback quality contribute to self-regulatory learning processes. Feedback that offers explicit guidance and opportunities for reflection supports students' metacognitive regulation, enabling them to monitor their own progress and take corrective action (OECD, 2025; Woitt et al., 2025). These processes central to models of self-regulated learning suggest that feedback does more than signal performance; it fosters student agency and strategic adjustment (Faza & Lestari, 2025). This aligns well with the current study's findings, where learners' recognition of improved learning outcomes likely reflects not only the quantity of assessment and feedback received but also the quality and interpretability of

that feedback. Importantly, this study's context at the secondary level aligns with recent research documenting the differentiated implementation of formative strategies. While core assessment practices such as objective clarity and checks for understanding are commonly reported, student centered approaches such as self and peer assessment remain less frequently implemented, as shown by slightly higher mean scores. Such patterns are echoed in contemporary studies which argue that transformative formative assessment requires a cultural shift toward learner involvement in the assessment process (Innovative Research Journal of Education, 2025; Alordiah, 2025). Peer and self-assessment, when effectively integrated, provide additional feedback channels and opportunities for deeper cognitive engagement, both of which are linked with improved academic performance and self-regulated learning outcomes (Innovative Research Journal of Education, 2025).

The moderate to strong relationships observed between variables in this study also reflect broader global trends in educational research. For instance, systematic reviews highlight that formative assessment and high-quality feedback collectively enhance educational equity and learning outcomes, particularly when aligned with clear performance criteria and timely delivery (OECD, 2025; Foster, 2024). These reviews underscore that the impact of formative practices is strongest when feedback is designed to be actionable, relevant, and comprehensible for students a principle that is affirmed by the higher predictive weight of feedback quality in the present study. Overall, the findings offer robust empirical support for educational theories positing that assessment and feedback are integral components of effective learning systems. The significant predictive and correlational results provide evidence that formative assessment practices, when effectively coupled with high quality feedback, are associated not only with improved learning outcomes but also with instructional quality and student perceptions of learning progress (Tofail & Malik, 2025; Ajmal, Basit, & Sadaf, 2024). Given these outcomes, the study underscores the necessity for ongoing professional development for teachers to enhance both formative assessment literacy and feedback provision, thereby strengthening the instructional supports that facilitate student learning.

**Conclusion**

The present study investigated the effect of formative assessment practices and feedback quality on learning outcomes at the secondary level. The findings indicate that both formative assessment and feedback are significant predictors of students' academic performance, collectively explaining approximately 30% of the variance in learning outcomes. Feedback quality emerged as a stronger predictor than formative assessment practices, highlighting its pivotal role in guiding students' learning, providing actionable insights, and supporting the attainment of learning objectives. These results underscore the intertwined nature of assessment and feedback in shaping student achievement and confirm the theoretical assertion that feedback is not merely evaluative but serves as a critical driver of learning improvement and self-regulation. Descriptive analysis revealed that while core formative assessment strategies such as clarifying lesson objectives and monitoring student understanding are moderately implemented, student-centered approaches like self-assessment and peer assessment are less frequently practiced. Similarly, feedback is generally perceived as clear, respectful, and motivating; however, timeliness and actionable guidance show room for enhancement. These findings suggest that while teachers recognize and implement formative assessment principles, the full integration of student-centered, reflective assessment and high-quality feedback remains a developing practice. This aligns with contemporary literature emphasizing that maximizing the impact of assessment on

learning outcomes requires moving beyond procedural assessment toward strategic, interactive, and learner-centered approaches. Moreover, the study highlights the interrelationship between formative assessment, feedback, and learning outcomes, emphasizing that feedback quality mediates the effectiveness of formative assessment practices. This demonstrates that improving the clarity, specificity, and actionable nature of feedback can significantly enhance students' academic performance. The findings provide empirical support for contemporary pedagogical theories advocating the integration of formative assessment and feedback to foster self-regulated learning, motivation, and deeper cognitive engagement among secondary-level learners. Collectively, the results underscore the critical role of instructional strategies that combine structured assessment with timely, high-quality feedback to optimize learning outcomes.

**Future Recommendations**

1. Educational institutions should implement targeted training programs to enhance teachers' formative assessment literacy and feedback delivery skills, emphasizing student-centered approaches such as self- and peer assessment.
2. Schools should focus on providing timely, specific, and actionable feedback that guides students toward their next learning steps, supporting self-regulated learning and improving academic outcomes.
3. Adoption of digital tools and platforms that facilitate formative assessment and feedback can improve the efficiency, reach, and personalization of instructional strategies.
4. Future interventions should prioritize engaging students in the assessment process, promoting self-reflection and peer evaluation to enhance motivation, metacognition, and independent learning skills.
5. Longitudinal and experimental studies should examine the causal mechanisms of how formative assessment and feedback quality impact learning outcomes across diverse subjects, grade levels, and cultural contexts to generalize findings and refine pedagogical strategies.

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