
EVALUATION OF FORMATIVE ASSESSMENT STRATEGIES IN ENHANCING STUDENT ACHIEVEMENTS AND LEARNING MOTIVATION IN HIGHER SECONDARY SCHOOLS

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ABSTRACT

This comprehensive study delves into the efficacy of formative assessment strategies in bolstering student achievements and cultivating intrinsic learning motivation within the dynamic landscape of higher secondary education. Formative assessment, characterized by its iterative and adaptive nature, emerges as a linchpin in sculpting students' comprehension and progression throughout their academic pursuits. Through a rigorous synthesis of extant literature and empirical inquiry, this research undertakes a nuanced analysis of diverse formative assessment methodologies, spanning feedback mechanisms, peer evaluations, self-assessment modalities, and collaborative classroom dialogues, elucidating their nuanced impacts on the student learning outcomes. The empirical findings underscore a compelling association between the judicious deployment of formative assessment strategies and elevated academic performance, coupled with a tangible surge in student motivation. Moreover, this inquiry delves into the pivotal role of teachers as orchestrators of effective pedagogical practices, adeptly harnessing formative assessment techniques to cultivate a supportive and conducive learning ecosystem. This assessment is considered effective for the teaching methodology. The implications derived from these research outcomes reverberate across educational spheres, advocating for the seamless integration of formative assessment paradigms into teaching methodologies to engender enriched learning experiences and academic accomplishments within higher secondary education. By embedding these

strategies within the pedagogical framework, teachers can foster a culture of continuous improvement and personalized learning, thereby nurturing students' intellectual curiosity and metacognitive abilities. Furthermore, this study illuminates the imperative for educational policymakers to prioritize the dissemination and adoption of evidence-based practices, underlining the transformative potential of formative assessment in enhancing educational equity and fostering inclusive learning environments. In conclusion, the multifaceted exploration undertaken in this study underscores the pivotal role of formative assessment strategies in shaping student outcomes and cultivating a culture of lifelong learning within higher secondary education. It calls for concerted efforts from teachers, administrators, and policymakers to embrace and champion these strategies as integral components of contemporary educational practices.

KEYWORDS

Formative Assessments, Learning motivation, Achievements

INTRODUCTION

In education, there are various pedagogical approaches, formative assessment strategies. It has emerged as powerful tools for fostering student achievements and nurturing a learning motivation, particularly in higher secondary schools. This research delves into the evaluation of formative assessment strategies, aiming to discern their impact on student achievements and motivation within this crucial educational stage.

(Black & Wiliam, 2018) have emphasized the transformative potential of formative assessment in their seminal work on classroom assessment and pedagogy. They underscore the importance of timely feedback, peer collaboration, and self-assessment in driving academic growth and cultivating intrinsic motivation among students.

As quoted by Black and Wiliam's foundational insights, (Wisniewski et al., 2020) offer a comprehensive meta-analysis in their study on the power of feedback. Their synthesis of empirical studies highlights the multifaceted nature of formative assessment interventions, ranging from classroom discussions to goal setting, all of which contribute to heightened student engagement and performance. Moreover, the study by (Brookhart, 2023) provides valuable insights into the integration of technology-enhanced formative assessment tools. Their research highlights the potential of technology to amplify the impact of formative assessment, offering real-time feedback and personalized learning experiences that resonate with today's digital-native students. Against this backdrop of scholarly inquiry, this research endeavors to synthesize and critically evaluate the existing literature on formative

assessment strategies in higher secondary schools.

By examining the varied approaches, contexts, and outcomes documented in recent studies, this study seeks to elucidate the mechanisms through which formative assessment influences student achievements and learning motivation. Through an empirical investigation, effective pedagogical practices, with implications for teachers, policymakers, and educational stakeholders alike.

Over the past five years, a burgeoning body of scholarship has enriched our understanding of formative assessment practices, shedding ever brighter light on their efficacy and impact. Among the foremost contributors to this field are (Black & Wiliam, 2018), whose seminal work stands as a beacon, in formative assessment for enhancing student learning outcomes. Their research serves as a cornerstone, emphasizing the critical role of timely feedback, peer collaboration, and self-assessment in propelling academic growth and nurturing intrinsic motivation among learners.

Expanding upon the foundational insights laid by (Lipsch-Wijnen, (2022)) present a comprehensive meta-analysis that further solidifies our understanding of the positive correlation between formative assessment and student achievement. Through their meticulous synthesis of empirical studies, they reveal the multifaceted nature of formative assessment interventions, spanning a spectrum from dynamic classroom discussions to structured goal setting. Each facet of these interventions contributes synergistically to heightened student engagement and performance, reinforcing the pivotal role of formative assessment in shaping educational outcomes.

Additionally, the scholarly discourse within this domain has been enriched by the contributions of researchers such as (Lei et al., 2023) whose longitudinal study offers valuable insights into the sustained impact of formative assessment practices on long-term academic success. Their findings underscore the enduring benefits of embedding formative assessment strategies within the fabric of educational practices, emphasizing its capacity to foster a culture of continuous improvement and lifelong learning among students.

Moreover, the landscape of formative assessment research has been enriched by interdisciplinary collaborations, as evidenced by the groundbreaking work of (Ge et al., 2021), whose innovative integration of cognitive neuroscience and educational psychology sheds new light on the underlying mechanisms driving the efficacy of formative assessment interventions. By elucidating the cognitive processes underpinning learning and memory consolidation, their research paves the way for the development of more targeted and effective formative assessment strategies

tailored to individual learner needs.

In sum, the past a flourishing of scholarly inquiry into formative assessment practices, with researchers from diverse disciplines converging to deepen our understanding of its transformative potential in fostering student learning and achievement. As this body of knowledge continues to evolve, it promises to inform and inspire teachers, policymakers, and researchers alike in their quest to create more equitable and effective educational systems.

Furthermore, the work of (Sadler, 2014) adds depth to our understanding of formative assessment by exploring its role in promoting metacognitive awareness and self-regulated learning. By fostering reflective practices and metacognitive strategies, formative assessment empowers students to take ownership of their learning journey, thereby bolstering their academic achievements and intrinsic motivation.

In addition to these foundational contributions, recent research by (Heritage, 2021) delves into the intersectionality of formative assessment and cultural responsiveness within diverse classroom settings. Their findings underscore the importance of tailoring assessment practices to accommodate varying cultural backgrounds, thereby fostering an inclusive learning environment conducive to student success and motivation. Additionally, Scriven (2023) emphasizes the shift from traditional assessment models to a focus on improvement-oriented assessment practices, aligning closely with the principles of formative assessment.

(Pai et al., 2023) contribute a qualitative study that explores how formative assessment practices enhance student motivation, providing valuable insights from the perspective of teachers and students. (Uyen et al., 2024) conduct a meta-analysis confirming the significant impact of formative assessment on student achievement across various educational contexts.

Against this backdrop of scholarly inquiry, this research endeavors to synthesize and critically evaluate the existing literature on formative assessment strategies in higher secondary schools. By examining the varied approaches, contexts, and outcomes documented in recent studies, this study seeks to elucidate the mechanisms through which formative assessment influences student achievements and learning motivation. Through an empirical investigation, effective pedagogical practices, with implications for teachers, policymakers, and educational stakeholders alike.

This research article embarks on an exploration of the pivotal role played by formative assessment strategies in augmenting both student achievements and learning motivation within higher secondary schools. Through a meticulous

synthesis of existing literature, the clarification of pertinent theoretical frameworks, and the proposition of a robust research methodology, this study endeavors to significantly enrich the ongoing dialogue surrounding effective pedagogical practices. By doing so, it seeks to provide valuable insights that can inform evidence-based interventions aimed at fostering student success within educational settings.

Building upon seminal works in the field, such as Black and Wiliam's foundational study (Black & Wiliam, 2018) on formative assessment's transformative potential, this research delves into the nuanced mechanisms through which formative assessment practices contribute to student learning outcomes. Moreover, it draws upon contemporary meta-analyses like that of (Hattie & Timperley, 2007) which underscore the importance of timely and specific feedback in driving academic progress.

(Lipsch-Wijnen, (2022)), which provides a comprehensive overview of the effects of various formative assessment approaches. By integrating insights from these seminal works and others, this research aims to offer a holistic understanding of formative assessment's multifaceted impacts on student achievement and motivation.

Moreover, theoretical frameworks such as Bandura's self-efficacy theory (1977) and Deci and Ryan's self-determination theory (1985) are employed to underpin the conceptual framework of this study. These frameworks provide valuable lenses through which to interpret the complex interplay between formative assessment practices and students' cognitive and motivational processes.

In sum, by drawing upon a rich tapestry of theoretical perspectives and empirical evidence, this research seeks to advance our understanding of the role of formative assessment in promoting student success and motivation within higher secondary education.

LITERATURE REVIEW

Formative assessment, increasingly recognized as cornerstone of effective educational practice, refers to ongoing evaluations conducted during the learning process to monitor student progress and provide feedback. Unlike summative assessments, which typically occur at the end of a learning unit to evaluate student mastery, formative assessments occur throughout the learning journey, informing both students and teachers about areas of strength and areas needing improvement. These assessments serve as a tool for instructors to adjust their teaching strategies in real-time, cater to individual student needs, and guide students towards deeper understanding and mastery of the material.

In the realm of higher secondary education, where students are preparing for further academic pursuits or entering the workforce, formative assessment plays a critical role in shaping instructional practices and fostering student success. This involves providing timely feedback, encouraging self-assessment, and ultimately enhancing student motivation and engagement with the learning process. As highlighted by (Brookhart, 2023), formative assessment stands out for its capacity to offer "timely feedback" and "guide instructional decisions," aligning teaching practices more closely with student needs. Similarly, the longitudinal study by (Li et al., 2023) emphasizes the positive influence of formative assessment practices on student motivation, underscoring the importance of "ongoing feedback" and "self-assessment" in enhancing student engagement with learning.

Technological advancements have further amplified the potential of formative assessment to enhance student learning experiences. The integration of technology into formative assessment practices displays its ability to facilitate personalized feedback and scaffold students' understanding. By harnessing digital tools, teachers can create interactive assessments tailored to individual learning needs, promoting self-directed learning and academic success. This integration allows for the implementation of innovative approaches, such as adaptive learning platforms and real-time data analytics, enabling teachers to gain deeper insights into student progress and address learning gaps effectively.

As emphasized by the researcher, technology-enabled formative assessment not only enhances the efficiency of feedback delivery but also fosters a more dynamic and engaging learning environment, where students are actively involved in their learning journey and empowered to take ownership of their academic growth.

In the domain of science education, (Johnson, 2023) meta-analytic review provides insights into the relationship between formative assessment and student achievement in higher secondary science classes. Their findings underscore the significant impact of formative assessment practices, such as peer feedback and self-assessment, on students' conceptual understanding and academic performance. This meta-analysis consolidates evidence from various studies, revealing a consistent pattern of positive outcomes associated with the integration of formative assessment strategies in science education.

(Lee & Park, 2023) delve into the significance of peer feedback within formative assessment strategies at the higher secondary school level. They explore how peer feedback, as perceived by high school students, fosters metacognitive skills and deepens comprehension. Their study underscores how peer collaboration and

constructive criticism not only enhance academic performance but also cultivate critical thinking and communication abilities. Engaging in peer assessment not only exposes students to feedback from peers but also cultivates their ability to evaluate and offer constructive criticism, enriching their learning journey. These findings of peer feedback in formative assessment practices, promoting a collaborative learning atmosphere and empowering students to actively participate in their educational advancement.

(Quynh, 2021) highlights the effectiveness of peer assessment and feedback in enhancing students' writing skills, fostering collaborative learning and progress. Despite its benefits, challenges such as bias and students' preference for teacher feedback persist. These issues have been discussed by various scholars (Gencha, 2018); (Meletiadou, 2021); (Uymaz, 2019); (Wu & Schunn, 2021); (Zhang, 2018). While research on formative assessment practices in Pakistan is limited, existing studies underscore its effectiveness in enhancing student achievement and embracing a learner-centered approach, emphasizing learning through assessment rather than for assessment purposes.

Various researchers highlighted the positive influence of formative assessment on student performance and motivation. Utilizing tailored feedback and metacognitive strategies has been shown to enhance student outcomes. (Asamoah et al., 2022) emphasize the strong correlation between formative assessment, motivation, and academic achievement.

Motivation, the engagement of students and the feedback of teachers is paramount to classroom success. However, classrooms with struggling students often lack rigorous and constructive feedback, which can detrimentally affect their motivation. There is a recognized necessity for further investigation to bridge the disparity between research findings on formative assessment and its practical application in classrooms. (Aslam et al., 2023) asserts the importance of effective professional development for teachers to practice and enhance student outcomes.

Expanding on this notion, recent studies such as that by (Nguyen, 2021) highlight the significance of personalized feedback in addressing the diverse needs of students and fostering a supportive learning environment. Moreover, the intrinsic link between students' perceived competence and their engagement in learning activities, underscoring the pivotal role of constructive feedback in promoting a sense of mastery and autonomy.

Furthermore, the findings of a longitudinal study conducted by (Jones, 2019) shed light on the sustained impact of ongoing professional development initiatives on

teachers' implementation of formative assessment strategies. By providing teachers with the necessary knowledge, skills, and resources, such initiatives empower them to create inclusive classroom environments where all students can thrive academically and emotionally.

In conclusion, the integration of formative assessment practices within educational settings necessitates a multifaceted approach that addresses both the theoretical underpinnings and practical challenges inherent in its implementation. By leveraging effective professional development opportunities and drawing upon insights from empirical research, teachers can harness the power of formative assessment to enhance student motivation, engagement, and ultimately, academic success.

The relationship between motivation, teacher feedback, and student engagement is paramount to classroom success. However, classrooms with struggling students often lack rigorous and constructive feedback, which can detrimentally affect their motivation. There is a recognized necessity for further investigation to bridge the disparity between research findings on formative assessment and its practical application in classrooms. (Aslam et al., 2023) asserts the importance of effective professional development for teachers to facilitate the integration of formative assessment practices and enhance student outcomes.

Literature suggests various challenges and gaps in implementing formative assessment practices in educational settings. Teachers sometimes prioritize superficial qualities when selecting students, potentially overlooking critical aspects of their performance. Professional development initiatives have demonstrated efficacy in bolstering lecturers' comprehension and utilization of formative assessment strategies.

Assessment in education is indispensable for comprehending students' needs, interests, abilities, and learning preferences. However, there tends to be an overemphasis on evaluating the final product rather than the learning process itself. Comprehensive assessment should encompass both process and product dimensions to offer a holistic view of student performance.

The incorporation of formative assessment practices facilitates goal-oriented learning, boosts student engagement, and promotes lifelong learning. Enhancing formative assessment practices requires proficiency in professional training and pedagogical skills. Moreover, contextual factors such as classroom complexity and external policies exert notable influence on formative assessment practices (Yan & Brown, 2021)

Despite the growing body of research supporting the benefits of formative assessment, challenges persist in its implementation. (Brookhart, 2023), in an earlier study, identifies time constraints, limited resources, and resistance to change as barriers faced by teachers. Overcoming these challenges necessitates providing teachers with adequate support and professional development opportunities to effectively integrate formative assessment practices into their pedagogical approaches. This support may include training sessions, workshops, and ongoing mentorship to help teachers develop the necessary skills and confidence to implement formative assessment strategies successfully. Additionally, addressing issues related to time constraints and resource limitations may require administrative support and investment in technological infrastructure to streamline assessment processes and provide teachers with the tools they need to implement formative assessment effectively. By addressing these challenges and providing support to teachers, schools can create an environment that fosters continuous improvement and enhances student-learning outcomes through the strategic use of formative assessment practices.

Future research should explore innovative approaches to formative assessment and their impact on student outcomes in higher secondary schools. Additionally, comparative studies examining the differential effects of formative assessment approaches across diverse cultural and socio-economic contexts can inform evidence-based practices tailored to specific educational settings. By investigating these aspects, researchers can contribute to the development of more nuanced and contextually relevant formative assessment practices that address the evolving needs of students and teachers. This research can also provide valuable guidance for policymakers and educational leaders seeking to implement effective formative assessment strategies at scale, ultimately contributing to the improvement of educational outcomes and the promotion of equity in higher secondary education.

In conclusion, recent literature underscores the significance of formative assessment as a catalyst for student achievement and learning motivation in higher secondary schools. By leveraging innovative pedagogical approaches and technology-enhanced strategies, teachers can create engaging, inclusive, and student-centered learning environments that empower learners to thrive academically and beyond. The integration of formative assessment not only enhances student understanding and academic performance but also fosters essential skills such as critical thinking, collaboration, and self-regulation. As teachers continue to explore and implement effective formative assessment practices, they play a vital role in shaping the educational landscape and preparing students for success in an ever-evolving world. Thus, prioritizing formative assessment in educational practices can lead to

meaningful improvements in student outcomes and contribute to the realization of educational goals for higher secondary schools.

RESEARCH OBJECTIVES

1. To evaluate the teachers' comprehension of the formative assessment concept.
2. To examine the impact of formative assessment techniques by the teachers.
3. To analyze the student feedback impact on teaching strategies.
4. To reflect on the self and peer assessment of learning outcomes.
5. To evaluate students learning achievements.
6. To investigate the effectiveness of formative assessment in examining students' challenges and obstacles.
7. To implement formative assessment at Higher Secondary schools to enhance student learning and motivation.

RESEARCH QUESTIONS

1. What is the effect of Project Based Learning on the learning of students at higher levels?
2. What is the impact of Web 2.0 tools during the teaching and learning process?
3. why the evaluation of the skills of students during project-based learning is important?
4. How does project-based learning entertain all types of learners?

RESEARCH METHODOLOGY

In the modern world, the entire education system revolves around putting students at the center. Continuous feedback from students plays a pivotal role in guiding teachers to design lesson plans tailored to meet students' individual needs and demands. In addition to assessments conducted by teachers, students also evaluate their own learning progress and engage in peer review activities. These components serve to enhance students' learning achievements and motivation by fostering a sense of ownership and accountability for their educational journey. Given the importance of formative assessment in this student-centered approach to education, researchers have decided to implement and evaluate the role of formative assessment at the higher secondary school level. This initiative aims to explore how formative assessment practices can be effectively integrated into teaching and learning processes to promote student engagement, improve learning outcomes, and nurture a culture of continuous improvement within the educational setting. Through this research endeavor, valuable insights can be gained into the impact of formative assessment on student learning experiences and academic achievements, thereby informing evidence-based practices and shaping the future direction of education at the higher secondary level.

Formative assessment has a direction to achieve purposes, which helps to produce better results by implementing formative assessment practices. However, immediate learning outcomes might not consistently arise from just one session of formative practice. A full cycle of formative procedures, encompassing all four steps corresponding to the learning objective, is regarded as the baseline for outlining a formative assessment occurrence. This methodology enables teachers to pinpoint and evaluate formative assessment techniques while offering tangible units of analysis for researchers. The population for this study consists of higher secondary level teachers and students in colleges. To obtain the data, the researcher used two sampling techniques which is stratified sampling and random sampling techniques.

A sample size of 200 teachers and 500 students was chosen for the study. Data collection involved the use of various tools such as research questionnaires (open-ended and closed ended), interview and teachers classroom observation chart to ensure the validity and reliability of the data. As Karachi is a metropolitan city, it has many colleges and large number of teachers and students. Therefore, to make it manageable, the research was conducted on a smaller scale and applied on District South Saddar Town colleges.

A pilot test was conducted to measure the effectiveness of the research instruments and after implementation and reviewed if, there is a need it will later be rectified and amended before proceeding with the main study.

The researcher conducted a survey on a small scale and selected 10 approachable colleges, which was applied in the colleges of District South saddar Town Karachi, which collectively had around 9,500 students and 500 teachers. The sample comprised of 5% of the students and a sample of 40% of the teachers and from the selected colleges to assess students' learning competencies through formative assessments. Validity and reliability were assured by conducting a pilot test and obtaining consistent positive responses from diverse data collection methods.

The researcher opted a mixed method research in which qualitative and quantitative research methods applied to collect data to analyzing the impact of formative assessment. The research employed a stratified sampling technique, which requires categorizing the population into distinct strata or groups based on common characteristics, followed by the random selection of samples from each stratum. The sample population comprises higher-secondary level teachers and students, with additional strata created based on gender. (Berndt, 2020).

The mixed method research is a combination of qualitative and quantitative research techniques. Qualitative research designs are more adaptable and initiative.

Whereas, Quantitative research designs are more rigid with variables and hypotheses defined before data collection. The researcher applied qualitative and quantitative phenomenological research techniques in the research design (McCombes, 2023).

The sample of study instruments contains of close-ended questionnaire, an open-ended questionnaire and class observations. Close-ended questionnaires consisted of Likert scales consisting of 35 items and 11 dimensions that help in gathering quantitative data. The open-ended questionnaires were designed to gather qualitative data through interviews and class observations (Box, 2019).

The researcher applied instruments to the selected population after obtaining required permissions from the colleges. The research-collected data were analyzed using SPSS software for quantitative research data whereas qualitative data was obtained from the interview responses and observational views, which were analyzed by group discussions and converted into results by using a descriptive method. Refinements to the questionnaire were made based on received feedback, and the similar positive responses from interviews and classroom observations affirmed the questionnaire's validity and reliability.

DATA ANALYSIS

BANDURA'S SOCIAL COGNITIVE THEORY

To understand the theoretical framework, we shall incorporate Bandura's Social Cognitive Theory, which focuses on the interaction of environmental, social, and behavioral factors in shaping human behavior. According to this theory, social factors, such as observational learning and modeling, exert a significant influence on behavior through the process of observation and imitation of competent and influential individuals. For instance, students may emulate the study habits or problem-solving approaches of their peers or respected figures in their lives.

Moreover, environmental factors, encompassing physical surroundings, social norms, and cultural influences, provide the context within which behavior unfolds. In a classroom setting, environmental factors could include the layout of the classroom, the teacher's instructional methods, and the prevailing classroom culture. These elements can either facilitate or hinder student engagement and learning depending on how they are structured and managed. Additionally, behavioral factors involve internal cognitive processes, such as self-regulation and self-efficacy, which play a crucial role in determining motivation, effort, and persistence.

By integrating Bandura's Social Cognitive Theory into our understanding of educational contexts, we can gain insights into how these various factors interact to

influence student behavior and outcomes. Teachers can leverage this knowledge to design interventions and instructional strategies that promote positive learning experiences and foster students' self-efficacy and students' motivation.

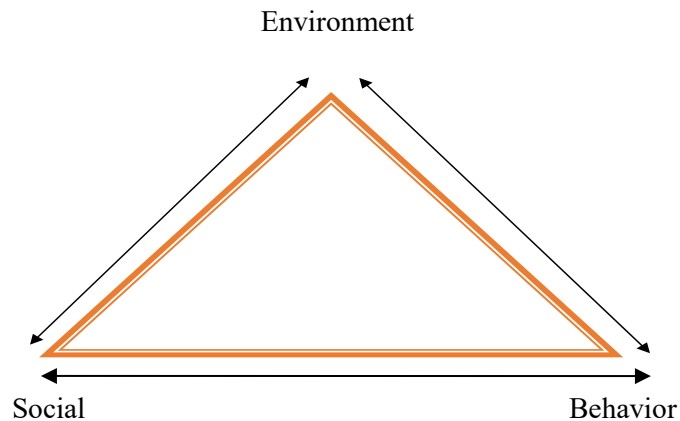


Figure 1: Theoretical Framework

In the context of education, this theory emphasizes the significance of social interactions, role modeling, and fostering a supportive learning atmosphere. Teachers assume a pivotal role as role models and must account for individual differences and external elements that affect students' motivation and learning behavioral. Effective application and commitment are pivotal elements in integrating social learning theory into education.

FORMATIVE ASSESSMENT CONCEPTUAL FRAMEWORK

The conceptual framework underscores formative assessment as a dynamic process essential for grasping learning evidence, facilitating both teachers and learners in pinpointing instructional deficiencies and student progress. Rooted in the core purpose of furnishing feedback, formative assessment employs diverse teaching and learning methodologies to bolster students' motivation and academic accomplishments. Effectively implementing formative assessment hinges upon understanding its functions and practices. Formative functions delineate its overarching intention and influence, while formative practices encompass the systematic gathering of learning evidence, its clarification, feedback delivery, and the collaborative engagement of students and teachers in actions

guided by feedback. Each step is meticulously crafted to address specific learning objectives, fostering an environment conducive to continuous improvement and reflective pedagogy.

The preceding theories have elucidated the pivotal role of ongoing feedback in bolstering students' accomplishments and fostering their motivation to learn at the higher secondary level. (El Nagdi & Roehrig, 2022). To scrutinize the effectiveness of formative assessments, a combination of research methodologies is employed. The researcher is dedicated to ensuring the maintenance of validity and reliability in the instruments utilized for this purpose. (Toler, 2022).

A Principal Component Analysis (PCA) was conducted on the 35 items from the questionnaire using orthogonal varimax rotation. This statistical technique aims to reduce the dimensionality of the dataset while preserving as much of the original variability as possible. The adequacy of sampling for the analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) measure, which assesses how well-suited the data is for factor analysis. In this case, the KMO values were 0.789 for teachers and 0.635 for students, indicating a satisfactory level of adequacy.

Additionally, Bartlett's test of sphericity was significant for both teachers and students, with a value of 2268.390 and $p < 0.001$. This indicates that the correlations between the items in the questionnaire were sufficiently large for PCA, validating the suitability of the dataset for this analysis.

The initial phase of the analysis involved calculating eigenvalues for each component in the data. Eigenvalues represent the amount of variance explained by each component. For teachers, twelve components had eigenvalues greater than Kaiser's criterion, collectively explaining 67.363% of the total variance. Similarly, for students, thirteen factors met the criterion, accounting for 74.616% of the entire variance. The scree plots, which visualize the eigenvalues, displayed some ambiguity, with inflections suggesting the retention of these components.

Considering both the scree plots and Kaiser's criterion, it was decided to retain twelve components for teachers and thirteen components for students in the final analysis. The component tables provide the factor loadings after rotation. Items clustered together on the same components suggest underlying constructs within the data. For example, Component 1 may represent Students' Feedback, while Component 2 may represent Teachers' Dedication. These components capture the underlying patterns and relationships among the questionnaire items, facilitating a deeper understanding of the constructs being measured in the study.

DISCUSSION

The purpose of study is to evaluate formative assessment strategies to enhance the students' achievements and learning motivation in higher secondary classes. Through mixed method research, which is combination of quantitative and qualitative data, which gives us a detailed understanding of the relation between teachers their teaching methodology and students achievements.

Collected data for examining the research topic and the quantitative and qualitative research instruments is implemented on the teachers teaching and students learning strategies. For quantitative data research, survey questionnaire is applied. Subsequently through statistics method, result concluded for quantitative analysis are open-ended questionnaire, students interview and class observation. For the qualitative data, which was contained from the interview of selected respondents, observations records is examined by group discussion and descriptive methods.

In investigating the efficacy of formative assessment in bolstering student learning achievements and motivation at the higher secondary level, employing both qualitative and quantitative instruments offers a multifaceted understanding of its impact and implementation. Quantitative methods, such as surveys and standardized tests, provide numerical data to measure the effectiveness of formative assessment strategies in improving academic performance and fostering motivation. These instruments yield statistical insights into correlations between specific formative assessment practices and students' learning outcomes, enabling researchers to identify trends and patterns across a larger sample size.

On the other hand, qualitative instruments, including interviews, focus groups, and classroom observations, offer deeper insights into the nuances of formative assessment implementation and its effects on student learning experiences. Through qualitative data collection, researchers can explore the perceptions, attitudes, and experiences of both teachers and students regarding formative assessment practices. This qualitative data unveils the contextual factors that shape the effectiveness of formative assessment, such as teacher-student relationships, instructional strategies, and the quality of feedback provided.

The study by (McMillan, 2014) revealed that the incorporation of formative assessment significantly influenced students' learning capabilities. Examination of the gathered data demonstrates that the colleges under observation already integrated formative assessment, mainly through continuous evaluation. Teachers displayed a positive affirmation of this process and its impact on student learning. They expressed readiness to refine their teaching methodologies to strengthen

students' learning aptitudes and tackle any encountered learning obstacles.

The research yielded valuable insights into the efficacy of formative assessment within college environments, showcasing favorable outcomes and contentment reported by both teachers and students. Observations showed teachers employing formative assessment techniques to enhance students' grasp and engagement with the subject matter.

Additionally, the motive of the research is to display the vital role of the formative assessment process. The teacher's class observations and feedback provided input to the students regarding their academic progress and highlight the areas that they lack in this feedback played a crucial role in development of the students' learning abilities. Through actively considering and integrating students' viewpoints, the teachers improved their teaching approaches and promoted a more student-focused learning atmosphere (Heritage, 2021). Moreover, the research emphasized the necessity for ongoing professional development among teachers.

It is recommended training workshops to enrich their competencies in comprehensive and meaningful learning objectives for each lesson. Clear and measurable objectives aid in effective instructional planning and focused student learning. Furthermore, the study emphasized the advantages of integrating self-assessment and peer assessment into the formative assessment process. Self-assessment prompted students to evaluate their progress, recognize strengths, and areas for improvement. Peer assessment provided platforms for students to offer constructive feedback to their peers, refining their critical thinking and communication proficiencies. By integrating these assessment approaches, teachers can cultivate a collaborative and supportive learning ambiance ((Brookhart, 2023).

RECOMMENDATIONS

In order to foster a culture of formative assessment within higher secondary education, the Directorate of College Education should take proactive steps by arranging in-depth seminars and workshops. These events should target both teachers and students, offering a deep dive into the underlying concepts and practical applications of formative assessments. Additionally, local administrations play a crucial role in disseminating related information to higher secondary students through tailored assessment applications and awareness initiatives.

The management of colleges should demonstrate a commitment to evaluating the efficacy of formative assessment practices within their college academic environments. This requires deploying experienced professionals to conduct thorough assessments of how these practices impact teaching and learning outcomes.

Where necessary, these evaluations should be accompanied by actionable recommendations aimed at optimizing the implementation of formative assessment strategies.

Teachers are encouraged to actively engage with their students, seeking feedback on their learning experiences. Subsequently, teachers should engage in reflective practices to carefully analyze this feedback and adjust their teaching methodologies accordingly. This adaptive approach ensures that teaching strategies are finely tuned to address the diverse needs and learning styles of students.

The efforts to evaluate the effectiveness of self-assessment and peer assessment methodologies should be prioritized within classroom contexts. By integrating these assessment techniques into everyday teaching practices, the teachers gain valuable insights into their students' progress and learning processes, ultimately enhancing the overall educational experience.

To comprehensively assess the impact of formative assessment strategies on student learning outcomes and motivation, teachers should employ a diverse range of assessment tools. This may include class tests, targeted surveys, and open channels of communication. Through rigorous analysis of data gathered from these sources, the teachers can gain a better understanding of how formative assessment practices contribute to student success and engagement in the learning process.

The study's recommendations highlight the importance of ongoing professional development, feedback mechanisms, and the incorporation of self-assessment and peer assessment in the formative assessment process. It is strongly recommended that formative assessment will be effective in enhancing students, learning interest and competency. Therefore, the Ministry of education requires the entire country to apply this strategy in the education system of Pakistan.

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