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Teacher Self-Efficacy as a Mediator Between Formative Assessment and Self-Regulated Learning in Maldivian Primary Schools

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Abstract

Background: Formative assessment is a cornerstone of Maldivian education policy, yet its role in fostering students' self-regulated learning (SRL) remains underexplored in this island nation. Despite its emphasis in policy, the mechanisms through which formative assessment influences SRL, particularly in primary education, require deeper investigation to inform effective teaching practices.

Objective: This study investigates the mediating role of Teachers' Self-Efficacy (TSE) in the relationship between Formative Assessment Practices (FAPR) and Students' Self-Regulated Learning (SRL) within Maldivian government primary schools, aiming to understand how teacher practices and confidence impact student outcomes.

Method: A qualitative research approach was employed, collecting data from 312 primary teachers across six regions in the Maldives. Data were analyzed using Structural Equation Modeling (SEM) to explore the relationships between FAPR, TSE, and SRL, ensuring robust statistical insights into the mediating dynamics.

Results: Findings reveal that formative assessment practices significantly enhance SRL in students. Teachers who consistently implement FAPR exhibit higher self-efficacy, indicating that these practices bolster teacher confidence. However, TSE does not directly influence SRL; rather, it acts as a partial mediator, amplifying the positive effect of formative assessment on SRL development.

Conclusions: The study highlights the critical link between formative assessment and SRL, emphasizing the need to integrate these practices into Maldivian education policies. Professional development programs should focus on enhancing teachers' self-efficacy to optimize formative assessment strategies. To address potential biases from self-reported data, future research should incorporate observational or experimental methods. These insights offer a pathway to improve teacher practices and student academic growth by embedding formative assessment effectively within the Maldivian education system.

Keywords: Formative Assessment; Self Regulated Learning; Education; Education Management; Assessment in Learning

Introduction

The role of formative assessment practices (FAPR) in enhancing students' self-regulated learning (SRL) has gained considerable attention in educational research over the past decades. SRL—a set of cognitive, metacognitive, and behavioral processes through which students actively manage their learning—has been recognized as a key determinant of academic success [1]. Through formative assessments, teachers provide real-time feedback, guiding students in setting learning goals, monitoring progress, and reflecting on outcomes, which are crucial elements of SRL. However, the successful implementation of these formative assessments depends significantly on teachers' self-efficacy (TSE) or their confidence in their ability to foster effective learning environments [2]. In this context, teacher self-efficacy shapes instructional practices and influences how assessment tools are utilized to promote deeper learning strategies. Studies suggest that teachers who feel confident in their teaching methods are more likely to employ formative assessment strategies that foster SRL, such as allowing students to self-assess and set learning goals [3].

Building on this, in recent years, the Maldives has introduced significant educational reforms to enhance the quality of teaching and learning in schools. Central to these reforms is the Outcomes-Based Education (OBE) National Curriculum, implemented in 2015 to improve students' educational outcomes by focusing on competencies and critical skills [4]. The curriculum introduced the Key Stage system, which allowed for greater flexibility in teaching practices and emphasized learner-centered approaches to education. One of the key innovations of this curriculum was the incorporation of formative assessment practices in primary grades. Despite formative assessment being a core component of the Maldivian educational policy in government primary schools, the role of these practices in directly fostering SRL remains underexplored. In the context of Maldives government primary schools, this connection between formative assessment and SRL is critical. However, many teachers struggle with applying formative assessments due to limited professional development and training in SRL-related practices [5].

Furthermore, while several studies emphasize the link between formative assessment and student achievement [2], few have investigated the mediating role of TSE in this relationship. This gap is especially pertinent in the Maldives, where educational challenges such as limited resources, uneven teacher training, and a diverse student population demand a more nuanced understanding of how formative assessment practices translate into SRL outcomes. Moreover, teacher self-efficacy is critical in addressing the motivational aspects of SRL. High self-efficacy leads teachers to believe in their capacity to motivate students, helping students develop confidence in their abilities to manage and regulate their learning processes [6]. This mediating role of self-efficacy bridges the gap between theory and practice, particularly in the Maldivian educational context, where formative assessments and SRL practices have not yet been fully integrated into daily teaching practices [7] .

Consequently, this study seeks to fill this research gap by investigating the mediating role of teachers' self-efficacy in the relationship between formative assessment practices and students' self-regulated learning. Specifically, it explores how TSE enhances teachers' capacity to implement formative assessments that promote SRL behaviors, such as goal setting, self-monitoring, and reflection. By investigating the mediating role of teachers' self-efficacy, this study will provide insights into how improving teacher confidence can lead to more effective formative assessment practices, ultimately enhancing students' SRL skills in Maldives government primary schools. Understanding this relationship is essential for informing teacher training and professional development programs, ensuring educators are adequately prepared to implement SRL strategies through formative assessment, and fostering more independent and successful learners. In the Maldives, despite the government's efforts to improve the quality of primary education through initiatives like the National Curriculum Framework (NCF) of 2015 and the Education Sector Plan (2019-2023), student's academic performance in government primary schools continues to fall below expectations, especially in core areas such as reading and mathematics [8]. One potential factor contributing to this underperformance is students limited self-regulated learning (SRL) skills development. SRL, which involves students actively participating in their learning by setting goals, monitoring progress, and adjusting their approaches, positively correlates with academic success [9]. However, the incorporation of SRL in Maldivian primary schools remains inconsistent.

Finally, a critical element that fosters SRL is formative assessment, where teachers provide continuous feedback to students, helping them identify learning gaps and adapt their strategies. While the NCF emphasizes formative assessment, its implementation in Maldivian primary schools has not been as effective as anticipated, partly due to teachers' lack of training and confidence in applying these practices . Teacher self-efficacy, or their belief in their ability to teach effectively, is crucial in how well formative assessment practices are applied and how they influence students' SRL [10]. However, the problem lies in the insufficient empirical research examining the relationship between teachers' formative assessment practices, their self-efficacy, and students' development of SRL in the Maldivian context. Without this understanding, policy reforms and professional development efforts may not adequately address teachers' challenges, limiting the potential of formative assessment to enhance SRL. Therefore, this research aims to investigate the mediating role of teacher self-efficacy in the relationship between formative assessment practices and SRL in government primary schools in the Maldives. This study makes a significant and novel contribution to educational research by examining the mediating role of teacher self-efficacy in the relationship between formative assessment practices and students' self-regulated learning, specifically within the underexplored context of a small state developing country. While previous research has established the direct impact of formative assessment on student learning outcomes, there remains a lack of empirical evidence on the underlying psychological and pedagogical mechanisms that shape its effectiveness. By positioning teacher self-efficacy as a key mediating factor, this study deepens theoretical insights into how teachers' confidence and instructional capability

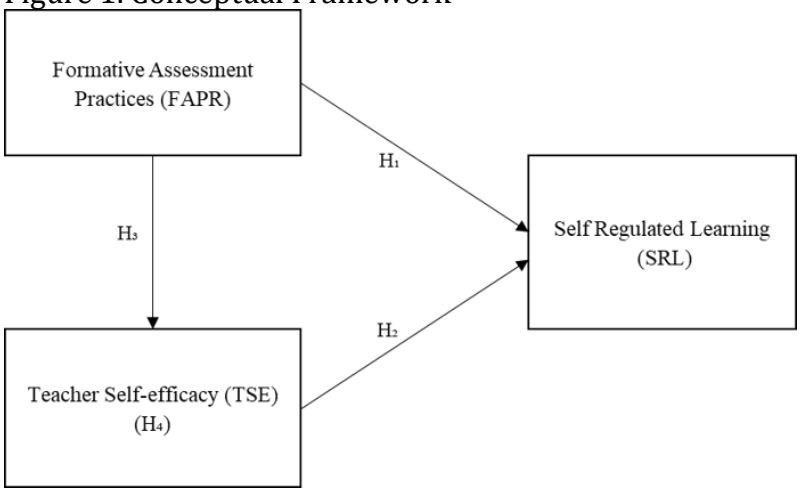
influence how formative assessment is applied and how it fosters self-regulated learning. This context-specific analysis fills a critical gap in literature and offers practical implications for teacher development and assessment reform in similar educational systems.

Methods

The research methodology adopted in this study systematically examines the relationships between formative assessment practices, teacher self-efficacy, and students' self-regulated learning in Maldivian government primary schools. It provides a structured approach to understanding how these variables interact within authentic classroom environments. The methodology encompasses a detailed conceptual framework to guide the investigation, clearly stated hypotheses aligned with the research objectives, and a well-defined research design to ensure methodological rigor. Additionally, the sampling process is carefully constructed to guarantee representation across various schools, allowing for meaningful and generalizable findings. This comprehensive approach ensures the validity and reliability of the study outcomes.

Conceptual Framework

Figure 1. Conceptual Framework



Formative Assessment Practices by Teachers (FAPR), Teacher Self-Efficacy (TSE), and Self-Regulated Learning (SRL) in government primary schools in the Maldives. It is grounded in established educational theories and prior empirical studies that highlight the influence of assessment practices and teacher beliefs on student learning outcomes. The framework posits that teachers who engage in effective formative assessment are more likely to foster SRL among their students. Additionally, Teacher Self-Efficacy is proposed as both a direct predictor of SRL and as a mediating variable in the relationship between formative assessment practices

and SRL. This framework serves as the foundation for the development of research hypotheses and guides methodological decisions throughout the study.

Hypotheses

H_1: There is a relationship between FAPR and SRL
H_2: There is a relationship between FAPR and TSE
H_3: There is a relationship between TSE and SRL
H_4: TSE mediates the relationship between FAPR and SRL.

Research Design Process

A quantitative research approach was employed in this study to collect numerical data that would provide objective insights into the relationships between formative assessment practices (FAPR), teacher self-efficacy (TSE), and students' self-regulated learning (SRL). The use of surveys and standardized questionnaires facilitated the measurement of critical variables, ensuring that the results could be generalized across the target population, as noted by [11]. This approach was chosen to generate reliable, empirical data supporting educational policy recommendations.

The reliance on quantitative methods allowed for objective and precise data collection. By focusing on objective measurement, the study yielded reliable insights into the relationships among FAPR, TSE, and SRL, supporting evidence-based practices in the educational field [12]. Furthermore, the generalizability of the findings was strengthened by using quantitative techniques, which ensured that the results could be applied across broader educational settings, making them relevant to various schools, both within and outside the Maldives [13].

Statistical analysis played a crucial role in this research. Techniques such as correlation analysis and mediation modeling were utilized to explore the relationships between FAPR, TSE, and SRL. These methods provided robust and empirical findings that contribute to the understanding of how formative assessment influences self-regulated learning through the mediating role of teacher self-efficacy [14]. The use of standardized instruments not only facilitated precise measurement but also ensured that the study could be replicated in different educational contexts, enhancing the reliability of the findings [15].

Given the unique geographical context of the Maldives, where the archipelago is dispersed across numerous islands, logistical challenges must be addressed in the data collection process. To overcome these challenges, online surveys allowed broad participation from teachers across different islands. This approach proved both cost-efficient and inclusive, ensuring that data collection was practical and accessible to a wide range of participants.

The study was grounded in a constructivist research paradigm, which guided the exploration of how teachers interpreted and implemented formative assessment practices to enhance SRL. This perspective was critical in considering the Maldivian education system's unique social and cultural context, where formative assessments

are integral to teaching and learning [16]. The constructivist approach helped frame the research within the reality of the participants' experiences, emphasizing the significance of teachers' perspectives in the data analysis.

A quantitative method using online surveys was selected as the primary research tool. This method was practical given the geographic dispersion of the Maldivian islands and the need for efficient data collection across such a vast area [17]. Using online platforms ensured that the study reached a broad demographic of teachers, essential for achieving a representative sample.

These surveys collected primary data validated through expert reviews and pre-testing. As research suggested, these steps ensured the data's reliability and accuracy [18] . The validation helped refine the survey instruments and accurately measure the critical constructs under investigation. This rigorous process enhanced the credibility of the findings and ensured the instrument's suitability for the Maldivian educational context.

The study adopted a cross-sectional time horizon, capturing a snapshot of teachers' formative assessment practices and their perspectives on SRL at a particular time. This approach provided timely insights into current practices and attitudes in Maldivian primary schools, offering valuable information for policy and practice [19]. However, future longitudinal research could offer deeper insights into how these practices and perceptions evolve over time and influence long-term student outcomes.

Data collection was facilitated through online platforms such as Google Forms, which offered a practical solution to the challenges posed by the Maldives' dispersed geography. These platforms ensured teachers across the islands could easily participate in the study, making the research inclusive and accessible. This data collection method was crucial in overcoming the logistical barriers typically accompanying research in geographically fragmented settings [20]. As a result, the study achieved broad participation, contributing to its findings' generalizability and relevance.

Sample Design Process

Table 1 outlines the sampling design employed in this study, providing a comprehensive overview of how participants were selected. It includes essential details such as the study population, unit of analysis, sampling design, and the sampling frame, which ensured clarity and alignment with the research objectives. The sampling technique used is also specified, along with a clear justification for its appropriateness in the context of the study. This justification is based on the need to achieve a representative sample of government primary school teachers across the Maldives. Additionally, the table presents the final sample size, which was determined using established statistical guidelines to ensure validity and generalizability of the

findings. Together, these elements reflect a systematic and rigorous approach to participant selection.

Table **Error! No text of specified style in document.**1. Sampling design

Component	Description
3.3.1 Study Population	Government primary school teachers in the Maldives were selected due to their crucial role in implementing formative assessment practices that impact students' self-regulated learning [21].
3.7.2 Unit of Analysis	Individual teachers as they directly influence formative assessment practices and self-regulated learning (SRL) [22].
3.7.3 Sampling Design	A combination of stratified random sampling across six regions of the Maldives, followed by random sampling within each region to ensure representative data collection. A total of 335 teachers from 36 schools were sampled proportionally.
3.7.4 Sampling Frame	Government primary schools only, excluding private schools, to maintain consistency in curriculum and instructional practices.
3.7.5 Sampling Technique	Stratified random sampling was employed to ensure fair representation from each region and minimize selection bias [23] .
3.7.6 Justification of Sampling Technique	Stratified random sampling was chosen to ensure that each region of the Maldives was proportionally represented in the study. This method facilitates a comprehensive understanding of teachers' practices across diverse geographical contexts, enhancing the generalizability of the findings.
3.7.7 Sample Size	It was determined using Yamane’s formula with a 95% confidence level, resulting in a sample size of 355 teachers from a population of 3,131. This ensures reliable and representative data collection.

Selection of Schools

Based on Yamane's formula and the use of an online sampling tool, a sample size of 36 schools was determined to be statistically appropriate. This sample was drawn from a total of 181 government primary schools across the Maldives. The selected schools ensured proportional representation from each region for accurate and reliable analysis.

Figure 2. Population and sample of schools

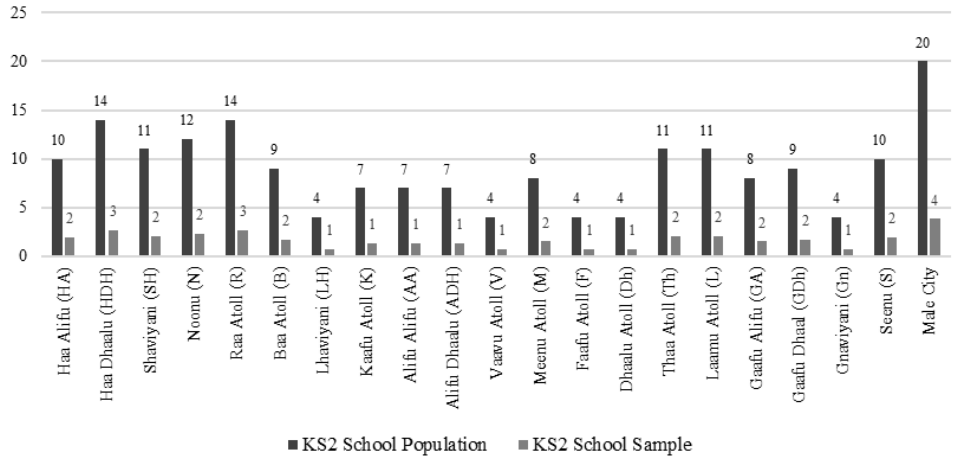


Figure 2 illustrates the proportionate allocation of schools among the selected atolls in each region. It is proportionally based on the percentage of the total number of schools in each atoll. This sampling approach ensured fair representation across regions, enhancing the generalizability of the study's findings.

Selection of Teachers

According to the Morgan Table, a sample size of 341 is suitable for a population of 3,000, and 351 for a population of 3,500. Given this guidance, the current study adopted a sample size of 355 teachers to ensure statistical adequacy. This sample size was deemed sufficient to enhance the reliability and generalizability of the research findings.

Figure 3. Population and sample of teachers

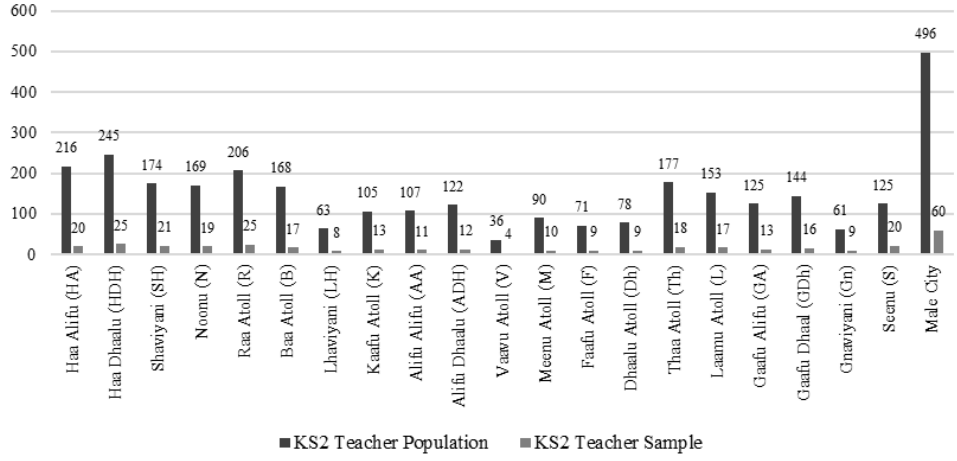


Figure 3 illustrates the proportionate allocation of teachers to each atoll in each region. Based on this allocation, the teachers from each stratum were selected. The next step was distributing these teachers among the selected atolls in each region. This was done proportionally based on the percentage of the total number of teachers in each atoll.

Instrument Development Process

The questionnaire developed for the study "The Mediating Role of Teachers' Self-Efficacy in the Relationship Between Formative Assessment Practices and Students' Self-Regulated Learning in Maldives Government Primary Schools" was meticulously crafted, guided by existing literature to ensure relevance and contextual suitability for Maldivian government primary schools. The process began with an extensive review of 15 critical studies on formative assessment and self-regulated learning, providing a comprehensive knowledge base that informed the development of the questionnaire. This ensured that the instrument was both theoretically grounded and practically aligned with the local educational context.

Key statements were adapted from five critical studies: [24], [25], [26], [27], and [28]. These statements covered formative assessment practices, teacher self-efficacy, and self-regulated learning, ensuring a well-rounded representation of the variables under investigation. During the adaptation and modification process, the statements were revised to fit the specific research context, with expert consultations and pilot testing ensuring each item's clarity, accuracy, and relevance. This rigorous approach strengthened the content validity of the questionnaire and ensured its appropriateness for the Maldivian primary education setting.

A Likert scale was utilized as the measurement tool, offering respondents a flexible and widely accepted means to express their levels of agreement with the various statements. The questionnaire was structured into thematic sections: demographic data, formative assessment practices, teacher self-efficacy, and self-regulated learning, ensuring a logical flow that enhanced ease of response. This structured design helped maintain respondent engagement and facilitated more accurate and consistent data collection.

The questionnaire was formatted and administered via Google Forms, offering participants easy access and a user-friendly interface. Consent forms and clear instructions were incorporated to guide respondents through the process. Throughout the development and administration of the instrument, ethical considerations were strictly adhered to, ensuring confidentiality, voluntary participation, and the responsible management of all collected data.

Table **Error! No text of specified style in document.**2. Reliability analysis of the questionnaire

Scale	Cronbach's Alpha	No. of Items
FAPR	.931	7
TSE	.947	7
SRL	.881	7
Overall	.948	21

Table 2 shows that the reliability of the research instrument was assessed using Cronbach's Alpha, a widely recognized measure of internal consistency. The

Cronbach's Alpha values for the scales in this study indicate a high reliability level, ensuring the measurements' accuracy and consistency across different constructs. These results provide strong statistical support for the internal coherence of the questionnaire items used in the study.

For the Formative Assessment Practices by Teachers (FAPR) scale, Cronbach's Alpha was recorded at 0.931 with seven items. This high value suggests that the items on the FAPR scale are strongly interrelated and consistently measure the formative assessment practices employed by teachers. The robust internal consistency reflects the scale's reliability in capturing the diverse aspects of formative assessment practices within Maldivian primary schools.

The Teacher Self-Efficacy (TSE) scale also demonstrated excellent reliability, with a Cronbach's Alpha of 0.947 across seven items. This indicates a high internal consistency among the items measuring teachers' confidence in influencing student outcomes and implementing effective teaching strategies. Such a substantial Cronbach's Alpha value underscores the reliability of the TSE scale in accurately reflecting teachers' self-efficacy in various classroom scenarios.

The Cronbach's Alpha for the Self-Regulated Learning (SRL) scale was 0.881, based on seven items. While slightly lower than the other scales, this value indicates internal solid consistency. The SRL scale effectively measures students' ability to regulate their learning processes, a critical construct in this study, and the high-reliability value suggests that the scale captures the nuances of students' self-regulation across different learning contexts. This level of reliability reinforces the scale's suitability for evaluating SRL in the context of Maldivian primary education.

Results

Descriptive Statistics

Table 3. Descriptive information

Factor		Count	%
Gender	Male	39	12.5%
	Female	273	87.5%
Age	Below 20 years	2	0.6%
	20 to 25 years	28	9.0%
	26 to 30 years	59	18.9%
	31 to 35 years	59	18.9%
	36 to 40 years	79	25.3%
	Above 41 years	85	27.2%
Experience	Less than 3 years	64	20.5%
	4 to 8 years	97	31.1%
	9 to 15 years	82	26.3%

	Above 16 years	69	22.1%
Qualification	Diploma or below	21	6.7%
	Bachelor's Degree	185	59.3%
	Master's Degree	106	34.0%
	Doctoral Degree	0	0.0%
	Other	0	0.0%
Grade Level	Grade 1	49	15.7%
	Grade 2	34	10.9%
	Grade 3	53	17.0%
	Grade 4	40	12.8%
	Grade 5	36	11.5%
	Grade 6	100	32.1%

Table 3 shows the demographic profile of the participants, providing critical insights into the teaching population involved in the study. The predominance of female teachers (87.5%) reflects the gender dynamics commonly observed in the teaching profession at the primary level, where women tend to dominate the workforce. This could have implications for understanding how gender-related factors may influence formative assessment practices and teacher self-efficacy.

The wide age distribution, with a significant proportion of teachers aged above 41 years (27.2%) and 36 to 40 years (25.3%), suggests that the sample includes a substantial number of experienced educators. The finding further supports that 31.1% of teachers have 4 to 8 years of experience, and 26.3% have 9 to 15 years. These figures indicate that the study benefits from the perspectives of seasoned professionals, who are likely to have well-established teaching practices and insights into formative assessment and self-regulated learning.

Regarding qualifications, most teachers hold a Bachelor's Degree (59.3%), with 34.0% having a Master's Degree. This highlights that a well-educated teaching workforce is essential for effectively implementing formative assessment strategies. The lack of teachers with a Doctoral Degree is not surprising, given the focus on primary education, where advanced academic qualifications are less common. Nonetheless, ongoing professional development remains crucial to ensure that teachers stay updated with innovative assessment practices and pedagogical approaches.

Representing various grade levels, particularly the high proportion of teachers in Grade 6 (32.1%), ensures that the study captures formative assessment practices across different stages of primary education. This diversity in grade-level teaching allows for a nuanced understanding of how formative assessment and teacher self-efficacy may vary depending on the student's age and developmental stage. It also enables the identification of specific challenges and opportunities associated with implementing formative assessment in upper versus lower primary grades.

Overall, the demographic profile suggests that the study is well-positioned to provide a reliable and generalizable assessment of the relationship between formative assessment practices, teacher self-efficacy, and self-regulated learning in Maldivian government primary schools. The diversity of the participant's age, experiences, and qualifications strengthens the study's capacity to explore these relationships across a broad spectrum of teaching contexts. This comprehensive representation enhances the validity of the findings and supports their relevance to policy and practice in primary education settings.

Data Analysis

Confirmatory Factor Analysis (CFA) via Overall Measurement Model

Confirmatory Factor Analysis (CFA) is employed to validate the structure of factors identified in the study and assess the relationships between factors such as formative assessment practices, self-regulated learning, and teacher self-efficacy. The analysis examines the accuracy of the indicators in reflecting their respective constructs while also assessing the reliability and validity of the model, including convergent and discriminator validity. AMOS version 20 is used for this purpose, and the model checks whether the assumptions, such as multivariate normality, are satisfied to ensure accurate parameter estimation. This approach thoroughly evaluates how well the constructions interact within the theoretical framework.

Figure 4 illustrates the structural equation model (SEM) depicting the hypothesized relationships among formative assessment practices by teachers (FAPR), teacher self-efficacy (TSE), and students' self-regulated learning (SRL). The model visually represents both direct and indirect pathways between the key constructs based on the proposed theoretical framework. It highlights how FAPR influences SRL directly and indirectly through the mediating role of TSE. Additionally, the model provides standardized path coefficients and significance levels, offering insight into the strength and direction of each relationship. This SEM serves as a critical analytical tool in validating the conceptual assumptions and testing the study's hypotheses through empirical data.

Figure 1. Confirmatory factor analysis

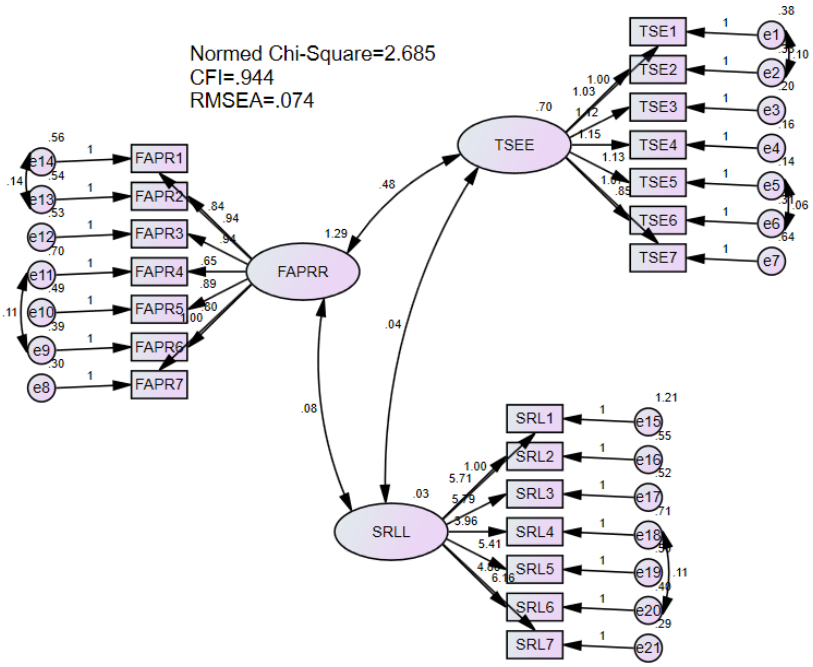


Table 4. Initial CFA model results

Category	Name of Index	Level of acceptance	Comment
Absolute Fit	RMSEA	RMSEA < 0.08	0.074 < 0.08 Acceptable
Incremental Fit	CFI	CFI > 0.90	0.944 > 0.90 Acceptable
Parsimonious Fit	Chisq/df	Chisq/df < 5.0	2.685 < 5.0 Acceptable

Table 4 presents the findings of the initial Confirmatory Factor Analysis (CFA) model, indicating a solid fit with the data. The Root Mean Square Error of Approximation (RMSEA) value of 0.074 falls well below the acceptable threshold of 0.08, indicating an acceptable level of model error [29]. Additionally, the Comparative Fit Index (CFI) of 0.944 exceeds the recommended minimum of 0.90, reflecting an excellent incremental fit, meaning the model provides a better fit than a baseline model where variables are uncorrelated [30]. Lastly, the Chi-square to degrees of freedom ratio (Chisq/pdf) is 2.685, well below the threshold of 5.0, signifying a parsimonious fit, which suggests that the model is relatively simple while still adequately explaining the relationships among the data. [31]. Collectively, these indices affirm that the model is well-fitted, valid, and reliable.

Hypothesis Testing (Structural Equation Model)

Figure 5 illustrates the Structural Equation Model (SEM) used to examine the relationships among formative assessment practices by teachers (FAPR), teacher self-efficacy (TSE), and students' self-regulated learning (SRL). This model demonstrates the direct effects of FAPR on SRL, as well as the mediating role of TSE in shaping this relationship. It visually captures the complex interactions among the

constructs, providing a detailed representation of how teacher practices and beliefs influence student outcomes. The model includes path coefficients and statistical significance values, offering evidence for the strength and direction of each relationship. By testing this model, the study aims to validate the hypothesized relationships and contribute to a deeper understanding of the mechanisms through which formative assessment and teacher efficacy impact student self-regulation.

Figure 2. Structural equation model

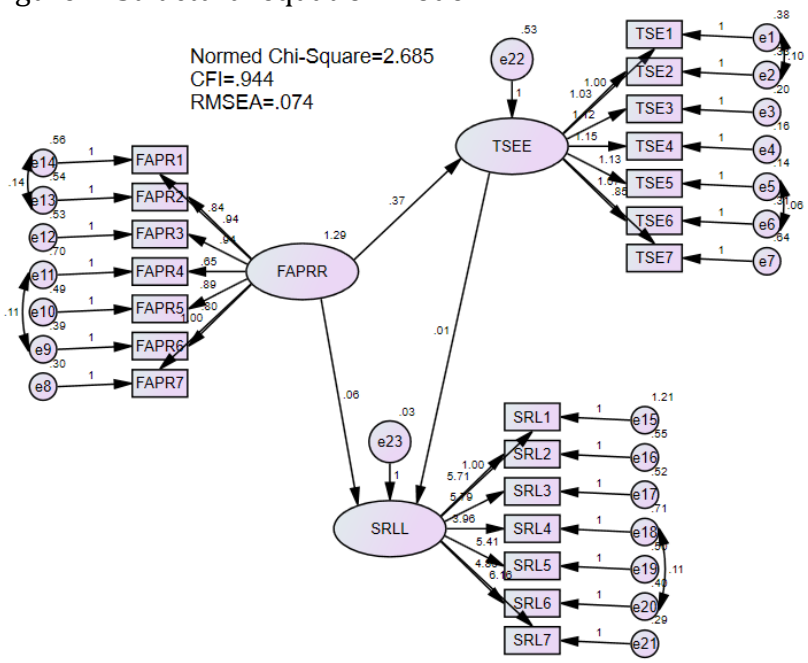


Table 5. Hypothesis testing

H.No	Paths	Estimate	S.E.	C.R.	P
H_1	SRLL <--- FAPRR	.061	.024	2.546	.011
H_2	SRLL <--- TSEE	.013	.015	.839	.402
H_3	TSEE <--- FAPRR	.374	.043	8.681	***

*<.05, **<.01, ***<.001.

Table 5 displays the results of hypothesis testing for Hypotheses 1 through 3, focusing on the direct relationships between key study variables. For the first hypothesis (H1), the findings reveal a significant positive relationship between formative assessment practices (FAPRR) and students' self-regulated learning (SRLL). Specifically, the estimate value is 0.061, with a critical ratio of 2.546 and a p-value of 0.011, indicating statistical significance at the 0.05 level. These results support the hypothesis that when teachers effectively implement formative assessment practices, students are more likely to engage in self-regulated learning behaviors. This direct influence highlights the important role that ongoing assessment strategies play in fostering students' autonomy, goal-setting, and self-monitoring in their learning process. The significance of this finding reinforces the value of integrating formative assessment as a core instructional approach in primary education.

The second hypothesis (H2) examines the relationship between teacher self-efficacy (TSEE) and students' self-regulated learning (SRLL). The results show no statistically significant relationship, with an estimated path coefficient of 0.013, a critical ratio of 0.839, and a p-value of 0.402. These values fall short of the conventional thresholds for statistical significance, suggesting that teacher self-efficacy does not directly influence students' self-regulated learning in this study. This non-significant finding implies that while teachers' confidence in their teaching abilities is important, it may not be sufficient to enhance students' self-regulatory skills. It also highlights the possibility that other factors—such as instructional strategies, classroom environment, or student characteristics—may play a more direct role in shaping students' ability to self-regulate their learning. As such, this result encourages further investigation into the contextual and mediating variables that might better explain the link between teacher beliefs and student outcomes.

For the third hypothesis (H3), the results reveal a strong and statistically significant positive relationship between formative assessment practices (FAPRR) and teacher self-efficacy (TSEE). The estimated path coefficient is 0.374, with a high critical ratio of 8.681 and a p-value of less than 0.001, indicating a robust level of significance. This finding suggests that teachers who actively implement formative assessment strategies tend to have higher levels of confidence in their teaching capabilities. Engaging in formative assessment may enhance teachers' sense of control, professional competence, and responsiveness to student needs, all of which contribute to greater self-efficacy. The strength of this relationship reinforces the idea that formative assessment is not only beneficial for student outcomes but also plays a critical role in empowering teachers in their professional practice. Consequently, professional development programs that promote effective formative assessment techniques could have the added benefit of boosting teachers' self-efficacy.

Mediation Testing

The indirect effects of formative assessment practices on self-regulated learning through teacher self-efficacy were examined using mediation analysis. This approach aimed at determining whether teacher self-efficacy serves as a significant intermediary in the relationship between formative assessment and student outcomes. By focusing on the mediating role of teacher self-efficacy, the analysis provides deeper insight into how teachers' confidence may influence the effectiveness of assessment strategies. Understanding this indirect pathway is crucial for informing both instructional practices and teacher professional development initiatives.

Table 6. Formative assessment practices (FAPR) vs. self-regulated learning (SRL)

H. No.	Path	Total Effects	Direct Effects	Indirect Effects
H_4	FAPR > TSEE > SRLL	0.402	0.373	0.029

Table 6 focuses exclusively on the path from formative assessment practices (FAPR) to self-regulated learning (SRL) through teacher self-efficacy (TSEE). This analysis investigates whether TSEE acts as a mediating variable that explains how formative assessment influences students' ability to regulate their own learning. The total effect observed is 0.402, indicating a strong overall relationship between FAPR and SRL. Of this total, 0.373 represents the direct effect of FAPR on SRL, while 0.029 reflects the indirect effect through TSEE. The presence of this indirect effect supports the hypothesis that teacher self-efficacy partially mediates the relationship, suggesting that teachers who feel confident in their instructional abilities are more likely to implement formative assessment strategies that, in turn, enhance students' self-regulated learning. This finding underscores the importance of supporting teacher self-efficacy as a mechanism for strengthening the effectiveness of formative assessment practices in educational settings.

Discussion

Principal Results

Relationship between SRL and FAPR

H_1, suggesting a positive relationship between Formative Assessment Practices by Teachers (FAPR) and Students' Self-Regulated Learning (SRL), is strongly supported by a significant estimate. This indicates that as teachers engage more in formative assessment, students are increasingly likely to improve their self-regulatory learning behaviors. In particular, the significant statistical results reinforce the strength of this relationship. These findings underscore the critical role of formative assessment in shaping independent, reflective learners capable of managing their own learning processes.

Furthermore, the findings align with existing literature on the impact of formative assessment on SRL. For instance, secondary school teachers who applied formative assessment saw considerable improvements in their students' SRL, particularly in self-evaluation and goal-setting skills. [32]. Similarly, the present study suggests that in Maldivian primary education, formative assessment helps students develop key self-regulatory skills, such as reflective and goal-directed learning. This consistency across educational levels reinforces the adaptability and effectiveness of formative assessment as a universal strategy for enhancing student autonomy and lifelong learning competencies.

Moreover, a recent longitudinal study in a Chinese educational setting demonstrated how sustained formative assessment led to significant and long-lasting improvements in SRL behaviors [33]. This research reinforces that consistent use of formative assessment in classrooms, such as those in Maldives, results in sustained progress in students' ability to regulate their learning, highlighting the potential long-term benefits of these practices for cultivating lifelong learning habits. These findings

support the importance of embedding formative assessment systematically within instructional routines to promote durable self-regulatory skills among students.

Formative assessment fosters SRL by encouraging activities like peer feedback and self-monitoring. Similarly, the significant relationship between FAPR and SRL in Maldivian government primary schools suggests that these formative practices contribute to developing similar self-regulatory skills [34]. Specifically, students benefit from opportunities to engage in reflective learning and receive constructive feedback from their teachers and peers, reinforcing the SRL process.
Studies demonstrated that self-assessment, a critical formative assessment component, is pivotal in enhancing students' self-regulation. In line with this, the present study indicates that self-assessment practices by teachers in Maldivian primary schools help students develop self-regulation by fostering their capacity to self-monitor and adjust their learning strategies [35]. These practices empower students to take ownership of their learning process, promoting greater autonomy and motivation in the classroom.

Furthermore, studies explored how formative assessment supports SRL in students with intellectual disabilities, demonstrating its adaptability across diverse learning populations [36]. Similarly, in the Maldivian context, formative assessment is a flexible approach that promotes SRL, even among students with different academic abilities, including those with special needs. Thus, this adaptability aligns with the Maldivian education system's prioritization of inclusive education.

Formative assessment significantly enhances students' perceived autonomy and self-efficacy, which are crucial components of SRL [1]. In agreement with these findings, the current study highlights that formative assessment practices in Maldivian primary schools improve SRL and build students' confidence in managing their learning independently. This suggests that consistent use of formative assessment not only supports academic progress but also nurtures essential learner attributes necessary for lifelong learning.

Furthermore, studies have reported the role of SRL in online learning environments, underscoring the relevance of formative assessment in digital contexts [24]. While this study focuses on traditional classroom settings, its findings imply that formative assessment can also play a crucial role in supporting SRL in online and blended learning environments in the Maldives, especially given the increasing importance of digital education post-COVID-19. In addition, researchers emphasized the role of formative assessment in enhancing evaluative judgment, a core aspect of SRL [37] . Consistent with their findings, this study suggests that formative assessment helps Maldivian students develop evaluative judgment, enabling them to monitor and adjust their learning strategies effectively.

The findings support the hypothesis that teachers' formative assessment practices positively influence students' SRL in Maldivian government primary schools. Indeed, these results are consistent with a growing body of research demonstrating formative

assessment's effectiveness in promoting critical self-regulatory skills such as reflection, goal setting, peer feedback, and self-evaluation [34], [38]. This reinforces the importance of equipping teachers with the necessary skills and support to implement formative assessment strategies effectively in their daily instructional practices.

Consequently, the Maldives' structured and evolving educational system benefits from the broader adoption of formative assessment practices. As this study shows, formative assessment enhances students' immediate academic performance and equips them with the self-regulation skills necessary for lifelong learning. Thus, these findings emphasize the importance of integrating formative assessment into teaching practices across government primary schools in the Maldives to develop independent, self-regulated learners who are well-prepared to meet the demands of future education and personal growth.

Relationship Between SRL and TSE

The data does not support H_2, which tests the relationship between Teachers' Self-Efficacy (TSE) and Students' Self-Regulated Learning (SRL). The estimate of 0.013 (C.R. = 0.839, p = 0.408) indicates a non-significant relationship, suggesting that TSE does not directly influence students' SRL. This outcome is somewhat unexpected given the extensive literature that associates high levels of TSE with a variety of positive educational outcomes, such as improved student achievement, greater engagement, and better classroom management. Typically, teachers with higher self-efficacy are more likely to implement effective formative assessment practices, which are essential in creating environments that foster SRL [39]. However, the findings in this study suggest that while TSE is crucial for many aspects of teaching, it may not directly affect students' development of SRL. Nonetheless, this does not discount the possibility that TSE indirectly influences SRL or through contextual factors not directly captured in this study.

The relationship between TSE and SRL is likely more complex and multifaceted than initially assumed, with indirect influences playing a critical role. For example, although teachers' self-efficacy may not directly enhance students' SRL, it is strongly linked to promoting SRL strategies that can indirectly influence students' motivation and self-regulatory behavior. Studies have found that while TSE did not directly affect student motivation, it was positively associated with teachers' promotion of SRL strategies, influencing students' motivational outcomes [40]. This finding suggests that while TSE may not directly improve SRL, it can create a learning environment that indirectly nurtures SRL by facilitating motivation and engagement.

Moreover, teaching quality and student engagement, which are known to support SRL, have been closely tied to high levels of TSE. Teachers with greater self-efficacy tend to demonstrate better teaching quality and foster higher levels of student engagement, both of which are conducive to SRL [41]. Therefore, although this study found no direct link between TSE and SRL, TSE might still play an indirect role by

contributing to an engaging, supportive classroom environment where SRL can flourish.

Additionally, high-quality teacher-student interactions have been found to enhance SRL development. Teachers with higher levels of self-efficacy are often more capable of building solid relationships with their students, which can, in turn, positively influence SRL [42]. Thus, while no direct relationship was observed between TSE and SRL in this study, it is plausible that these teacher-student interactions act as a mediating factor that enhances SRL, even if this link was not captured in the data.

Another potential explanation for the non-significant findings may be the variability across educational contexts. For instance, research by [43] found that TSE significantly influenced teaching practices and student outcomes in higher education settings, suggesting that the impact of TSE on SRL might vary depending on the educational level. In contrast, primary school students may rely more on structured guidance from their teachers and have not yet fully developed the independent learning strategies associated with SRL. As a result, TSE might exert less direct influence on SRL in primary school settings than in other educational environments.

Furthermore, teacher support, both in terms of instructional guidance and emotional support, is pivotal in fostering SRL. Empirical research emphasized that teacher support is crucial in technology-enhanced learning environments, where teachers with higher self-efficacy are more likely to provide the necessary support to encourage students to take control of their learning [44]. Thus, while TSE may not directly impact SRL, it likely influences SRL indirectly by enhancing the quality of support offered in the classroom, which is crucial for SRL development.

Broader perspectives on the relationship between TSE and SRL suggest that factors such as teacher support strategies and academic optimism may significantly influence SRL, even when the direct link between TSE and SRL is weak. Research has highlighted the importance of adopting a holistic approach, where TSE contributes to creating a positive learning environment that supports SRL indirectly through classroom climate and teacher attitudes [45]. This broader view suggests that while TSE may not directly influence SRL, it is part of a constellation of factors contributing to a supportive and effective learning environment.

In the specific context of Maldivian primary schools, the absence of a direct effect of TSE on SRL may be attributed to several systemic challenges, including limited professional development opportunities, resource constraints, and cultural influences. These factors may prevent teachers from fully applying their self-efficacy in practice. For example, studies in the Maldives highlighted that primary school teachers in the Maldives, particularly those teaching specialized subjects like physical education (PE), often lack professional development, undermining their confidence and ability to teach effectively [46]. Similarly, the gap in teachers' ability to consistently implement SRL strategies suggests that while teachers may have positive

attitudes toward SRL, their practices do not fully reflect this, indicating a need for more comprehensive training and resources. [5].

Therefore, although this study did not find a direct relationship between TSE and SRL, it is essential to consider the broader educational context and potential indirect pathways through which TSE may still play a significant role in supporting SRL development. The findings underscore the complexity of this relationship and point to the need for further research to explore the indirect effects and contextual factors mediating TSE's influence on SRL. Understanding these dynamics can help design more targeted interventions that leverage teacher self-efficacy to foster student self-regulation effectively.

Relationship Between TSE and FAPR

The data strongly supports H_3, demonstrating a positive relationship between Formative Assessment Practices by Teachers (FAPR) and Teachers' Self-Efficacy (TSE). The significant estimate of 0.374 (C.R. = 8.861, $p < 0.001$) suggests that their self-efficacy improves significantly as teachers engage more in formative assessment practices. The highly significant p-value confirms the robustness of this relationship. Indeed, it has been argued that teachers with higher self-efficacy are more motivated and capable of positively influencing their students' motivation and self-efficacy [47]. Therefore, a strong sense of self-efficacy is crucial for successful teaching, as it reflects teachers' confidence in their ability to achieve desired educational outcomes and positively impact student performance.

Moreover, formative assessment provides students with feedback and is closely linked to teachers' self-efficacy. Previous research suggests that changes in teacher self-efficacy are associated with improvements in formative assessment practices. For example, direct interactions with students have strengthened teacher identity, increasing job satisfaction and enjoyment [26], [48]. Similarly, researchers discovered a significant relationship between English teachers' self-efficacy beliefs and their implementation of formative assessment, further supporting that teachers with higher self-efficacy are more likely to engage in effective assessment practices [49].

A positive correlation exists between teacher self-efficacy and the implementation of quality instructional practices, such as individualized instruction and collaborative learning [50]. This finding aligns with previous research, demonstrating that teachers with higher self-efficacy tend to employ positive management strategies and adapt their teaching approaches more effectively [51]. Teachers with high self-efficacy are also more confident in planning lessons, assessing students, and selecting effective instructional methods. Therefore, building self-efficacy through formative assessment practices is particularly critical in the Maldives, where many teachers are generalists, especially in rural areas, and may require specialized training in certain subjects. Teachers with strong self-efficacy are more likely to design high-quality formative assessments that cater to diverse student needs, ultimately

enhancing student motivation and learning outcomes. Furthermore, studies emphasize that teachers with high self-efficacy promote instructional practices that are adaptable and inclusive, which is a necessity in Maldivian schools where classrooms often consist of students with diverse academic backgrounds.ds [52].

Furthermore, in the Maldivian context, teachers who feel confident in their teaching abilities are more inclined to adopt creative and inclusive pedagogical approaches. For instance, incorporating formative assessments that meet the needs of students from various linguistic and cultural backgrounds is essential in Maldivian classrooms, where Dhivehi-speaking students are often taught in an English-medium education system. Teachers with high self-efficacy are better equipped to address these challenges by developing flexible assessment strategies that enhance learning experiences for all students, thereby contributing to a more equitable educational environment.

Beyond the individual classroom level, the influence of teachers' self-efficacy extends to professional development and the broader educational culture within Maldivian schools. Indeed, ongoing professional development is critical to enhancing teachers' self-efficacy, particularly in helping them adopt more effective formative assessment practices. In the Maldivian context, where professional development opportunities can be limited—especially in geographically isolated atolls—targeted training programs are essential to improving teachers' confidence in implementing formative assessments. Professional development significantly enhanced teachers' self-efficacy and formative assessment practices in Vietnam [53]. Therefore, professional development initiatives in the Maldives must also focus on equipping teachers with the tools to use formative assessments effectively.

Similarly, improving working conditions and continuous professional development are crucial strategies for boosting teachers' self-efficacy, particularly in assessing learners using Indigenous languages [54]. In the same vein, Maldivian teachers face similar challenges when assessing students who may struggle with English, the language of instruction. Therefore, ongoing support and training in these areas can help teachers adapt formative assessments to meet their students' linguistic and cultural needs, enhancing their self-efficacy and student outcomes.

Moreover, social contagion is particularly relevant in the Maldivian educational context, where their colleagues can influence teachers' formative assessment practices and self-efficacy. Teachers are more likely to adopt formative assessment practices when their peers value and practice them [55]. This is particularly relevant in the Maldives, where schools are often small, and teachers work closely together. In such environments, collective efficacy can significantly shape individual teachers' formative assessment practices. Thus, fostering a collaborative culture around formative assessment can enhance overall teaching quality and teacher self-efficacy, contributing to improved educational outcomes.

In conclusion, the findings from this study strongly affirm the positive relationship between formative assessment practices and teachers' self-efficacy. This relationship has profound implications for the Maldivian education system. By engaging in formative assessment, teachers in the Maldives can strengthen their confidence in teaching, leading to more inclusive and effective instructional practices. This relationship is further enhanced by professional development programs and supportive school cultures that emphasize collective efficacy. Given the challenges faced by the Maldivian education system—such as geographic isolation, limited resources, and linguistic diversity—investing in professional development and fostering school environments that prioritize formative assessment will be crucial in promoting teachers' self-efficacy and improving educational outcomes across the country. For policymakers and educators, these findings underscore the importance of aligning teacher training with formative assessment strategies, ensuring teachers are well-equipped to support all students in their learning journey.

Mediation of TSE in the Relationship Between FAPR and SRL

In the case of Hypothesis 4, the total effect of Formative Assessment Practices by Teachers (FAPR) on Self-Regulated Learning (SRL) is 0.402, with a direct effect of 0.373 and an indirect effect of 0.029 through Teacher Self-Efficacy (TSE). The significant indirect effect highlights that TSE partially mediates the relationship between FAPR and SRL. This suggests that while FAPR directly impacts SRL, part of this influence is mediated by TSE, indicating that teachers who effectively implement formative assessment practices tend to develop stronger self-efficacy, which, in turn, positively contributes to students' self-regulated learning.

Teachers' self-efficacy is essential in mediating the connection between formative assessment practices and SRL, as it significantly influences how effectively teachers apply formative assessment strategies. Consequently, this affects student engagement, motivation, and their capacity for self-regulation. Teachers' self-efficacy impacts the relationship between formative assessment and SRL and plays a crucial role in ensuring the quality and consistency of these practices across various teaching contexts. Indeed, teachers with higher self-efficacy are more confident in integrating formative assessment into their routines, fostering an environment conducive to self-regulated learning. Moreover, teachers' self-efficacy influences students' perceptions of their abilities and shapes the classroom atmosphere, further promoting self-regulated learning behaviors.

However, while teachers' self-efficacy significantly fosters SRL, other factors might also affect this relationship. Future research should explore additional mediators or moderators to better understand the complex interplay between teacher beliefs, instructional practices, and student outcomes. Enhancing teachers' professional development, particularly in formative assessment, and boosting their self-efficacy are critical for creating engaging and motivating learning environments.

Research S. Zhang underscores that teacher self-efficacy is a significant predictor of adopting formative assessment practices [56]. Similarly, upon examining the relationship between self-efficacy beliefs and assessment practices among experienced university instructors, supporting that higher self-efficacy leads to more effective formative assessments [48]. Additionally, the importance of collaboration in developing formative assessment practices has been found that collaborative efforts improve teachers' self-efficacy attributes [26].

Furthermore, researchers have been interested in how teacher autonomy support influences student learning engagement, revealing that students' self-efficacy and SRL play mediating roles [57]. This finding is consistent with similar works that stressed the importance of teachers' self-efficacy in effectively planning and implementing differentiated instruction [58]. Additionally, research indicates that teachers' self-efficacy positively affects students' academic achievement and reading self-concept, underscoring the importance of supporting teacher self-efficacy to achieve positive learning outcomes [59].

Moreover, researchers examined formative assessment in Mainland China and found that teachers' intention to implement formative assessment mediates the relationship between their cognitive attitudes and formative assessment practice [59]. Similarly, affective attitudes partially mediate this relationship, highlighting teachers' attitudes' crucial role in implementing formative assessments. Additionally, recent research in the Philippines observed a significant correlation between teachers' academic optimism and students' SRL, indicating that higher levels of teacher optimism are linked to enhanced self-regulated learning behaviors among students. [45].

The literature consistently supports that teachers' self-efficacy beliefs are critical for fostering effective formative assessment practices and promoting SRL. By enhancing teacher self-efficacy, educational institutions can improve both instructional quality and student outcomes. Thus, the practical implications of these findings emphasize the need for educational institutions to invest in professional development programs focused on formative assessment while also boosting teachers' self-efficacy. Institutions can create environments that enhance teacher confidence through targeted training, collaborative learning communities, and ongoing mentoring. Equipping teachers with the necessary skills and self-efficacy to implement formative assessment practices effectively can lead to optimized instructional quality and improved student outcomes across diverse learning contexts.

The findings from Hypothesis 8a underscore the critical role of Teachers' Self-Efficacy as a mediator between Formative Assessment Practices and Self-Regulated Learning. By integrating theoretical insights with empirical evidence, this discussion advances our understanding of how teacher beliefs and instructional practices collectively shape educational outcomes. Consequently, these insights provide educators and policymakers with a foundation for developing informed strategies that promote

equitable access to quality education and foster the development of essential lifelong learning skills among all students.

Limitations

Despite its contributions, this study has some limitations. The reliance on self-reported data may introduce response bias, as teachers might overestimate their self-efficacy and formative assessment practices. Additionally, the cross-sectional design limits the ability to establish causal relationships, making it necessary for future research to adopt longitudinal studies that examine the evolving impact of formative assessment on self-regulated learning over time. The study is also limited to government primary schools in the Maldives, restricting the generalizability of the findings to other education systems, including private schools and secondary education levels. Furthermore, while quantitative methods provide robust statistical insights, qualitative approaches such as classroom observations and teacher interviews could offer a deeper understanding of the contextual factors influencing formative assessment implementation. Future research should expand into diverse educational contexts, including private schools, secondary education, and other small-state developing countries facing similar challenges. Longitudinal studies are needed to examine the long-term impact of teacher self-efficacy and formative assessment on student self-regulation. Additionally, integrating qualitative methods would provide deeper insights into teacher challenges, school culture, and institutional support. These findings can inform the development of comprehensive teacher training frameworks, ensuring the effective implementation of formative assessment to enhance student self-regulated learning and overall educational quality.

Conclusion

This study provides significant empirical insights into the relationship between formative assessment practices, teacher self-efficacy, and students' self-regulated learning in Maldivian government primary schools. The findings confirm that formative assessment is a crucial instructional strategy that enhances students' self-regulation skills. It supports previous research that highlights its role in fostering goal setting, self-monitoring, and reflection. Moreover, teacher self-efficacy is identified as a partial mediator in this relationship, indicating that while confident teachers are more effective in implementing formative assessments, self-efficacy alone is insufficient in improving students' self-regulated learning without the appropriate pedagogical strategies. These results underscore the need for comprehensive teacher training programs that equip educators with the skills and confidence to apply formative assessment in classroom settings effectively. The study holds important theoretical and practical implications. From a theoretical perspective, it extends the understanding of teacher self-efficacy as a mediating mechanism that influences the effectiveness of formative assessment in promoting student self-regulation. The study contributes to the growing body of research on formative assessment in small-state developing countries, offering a context-specific analysis that is relevant to similar education systems facing constraints in teacher professional development.

Practically, the findings highlight the need for targeted professional development initiatives focusing on formative assessment strategies, feedback mechanisms, and student autonomy support. Educational policymakers should prioritize teacher training programs that integrate evidence-based formative assessment practices, ensuring that teachers are adequately prepared to facilitate self-regulated learning. Moreover, fostering peer collaboration and mentorship programs among teachers can enhance professional growth and improve the quality of formative assessment implementation.

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Data Availability

The data supporting this study's findings are available on request from the corresponding author, Zidhna Waheed. The data, which contains information that could compromise the privacy of research participants, is not publicly available due to certain restrictions. Derived data supporting the findings of this study are available from the corresponding author, Zidhna Waheed, upon request. The data supporting this study's findings are available from the corresponding author, Zidhna Waheed, upon reasonable request.

Author Contributions Statement

The authors' Contributor Roles Taxonomy (CRediT) is provided below to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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Conflicts of Interest

The authors state no conflict of interest.

Ethics Approval

Before conducting this study, the authors obtained ethical approvals from the Maldives Ministry of Education, Maldives, and the Ethics Committee of Management Science University, Malaysia. The authors obtained informed consent from all individuals included in this study by providing an informed consent waiver and the option to withdraw.

References

1. Granberg C, Palm T, Palmberg B: A case study of a formative assessment practice and the effects on students' self-regulated learning; Studies in Educational Evaluation (68); 2021:100955; doi:10.1016/j.stueduc.2020.100955
2. Gotch CM, Poppen MI, Razo JE, Modderman S: Examination of teacher formative assessment self-efficacy development across a professional learning experience; Teacher Development (25); 2021:534-548; doi:10.1080/13664530.2021.1943503
3. Chen PP, Bonner SM: A framework for classroom assessment, learning, and self-regulation; Assess Educ (27); 2019:373-393; doi:10.1080/0969594x.2019.1619515
4. Di Biase R, Maniku AA: Transforming education in the Maldives. In: Sarangapani PM, Pappu R, editors. Handbook of education systems in South Asia. Singapore: Springer Singapore; 2021:545-573; ISBN:9789811500329
5. Waheed Z, Tham J, Keat OB: Exploring teacher beliefs and practices to enhance self-regulated learning in government schools in Maldives; European Journal of Education Studies (11); 2024:3; doi:10.46827/ejes.v11i3.5248
6. Perry NE, Lisaingo S, Yee N, Parent N, Wan X, Muis K: Collaborating with teachers to design and implement assessments for self-regulated learning in the context of authentic classroom writing tasks; Assess Educ (27); 2020:416-443; doi:10.1080/0969594x.2020.1801576
7. Shiyama A: Primary teacher professional learning in the Maldives: An explorative study of science process skills pedagogies. Doctoral dissertation. University of Bristol; 2021
8. Ministry of Education, Ministry of Higher Education: Maldives education sector plan 2019-2023. Male': Ministry of Education; 2019
9. Xu L, Duan P, Padua SA, Li C: The impact of self-regulated learning strategies on academic performance for online learning during COVID-19; Front Psychol (13); 2022:1047680; doi:10.3389/fpsyg.2022.1047680
10. Bandura A: Bandura's social cognitive theory. In: Encyclopedia of personality and individual differences. Springer; 2020:370; ISBN:9783319246123
11. Ranganathan P, Caduff C: Designing and validating a research questionnaire - part 1; Perspect Clin Res (14); 2023:152-155; doi:10.4103/picr.picr_140_23
12. Herwanis D, Alianur M, Maulida, Nasir K: Quantitative research: Data collection and data analysis for beginner researcher in discussion; EduCompassion: Jurnal Integrasi Pendidikan Islam dan Global (1); 2025:54-71; doi:10.63142/educompassion.v1i3.88

13. Keenan KE, Gimbutas Z, Dienstfrey A, Stupic KF, Boss MA, Russek SE, Chenevert TL, Prasad PV, Guo J, Reddick WE, Cecil KM, Shukla-Dave A, O'Donnell L, Zhou FL, Zhong J, Jain R, Friel HT, Wagner ML, Mugler JP, Finn JP, Jackson EF, Malyarenko DI: Challenges in ensuring the generalizability of image quantitation methods for MRI; Med Phys (49); 2022:2820-2835; doi:10.1002/mp.15195
14. Pakpahan DH, Sambung R: The impact of knowledge sharing on employee performance at Palangka Raya's health college; International Journal of Research in Business and Social Science (11); 2022:273-281; doi:10.20525/ijrbs.v11i5.1858
15. Vilkienė L, Vilkaitė-Lozdienė L, Juknevičienė R, Bružaitė-Liseckienė J, Geben K, Ryvitytė B: Is it reliable and valid if it is not replicable? On the importance of replicability in quantitative research; Taikomoji Kalbotyra (2020); 2020:33-38; doi:10.15388/taikalbot.2020.14.3
16. Yan Z, Pastore S: Assessing teachers' strategies in formative assessment: The teacher formative assessment practice scale; J Psychoeduc Assess (40); 2022:592-604; doi:10.1177/07342829221075121
17. McKenney S, Reeves TC: Educational design research: Portraying, conducting, and enhancing productive scholarship; Med Educ (55); 2021:82-92; doi:10.1111/medu.14280
18. Hashim S, Mohamad SF, Abdul Halim Lim S, Che Ahmat NH: Pretesting survey questionnaire: A guide on dissemination; International Journal of Academic Research in Economics and Management Sciences (11); 2022:3; doi:10.6007/ijarems/v11-i3/15228
19. Zhang XS, Zhang LJ, Parr JM, Biebricher C: Exploring teachers' attitudes and self-efficacy beliefs for implementing student self-assessment of English as a foreign language writing; Front Psychol (13); 2022:956160; doi:10.3389/fpsyg.2022.956160
20. Menon V, Muraleedharan A: Internet-based surveys: Relevance, methodological considerations and troubleshooting strategies; Gen Psychiatr (33); 2020:e100264; doi:10.1136/gpsych-2020-100264
21. Matulaitienė J, Kaminskienė L, Monkevičienė O, Lehtinen E: Teacher- and student-related factors supporting primary school students' self-regulated learning; Front Educ (10); 2025:1503867; doi:10.3389/feduc.2025.1503867
22. Leenknecht M, Wijnia L, Köhlen M, Fryer L, Rikers R, Loyens S: Formative assessment as practice: The role of students' motivation; Assess Eval High Educ (46); 2021:236-255; doi:10.1080/02602938.2020.1765228
23. Chaudhary MK, Ray BK: Treating the problem of non-response in stratified random sampling under calibration approach; Commun Stat Simul Comput; 2024:1-9; doi:10.1080/03610918.2024.2384559
24. Fatmawati A, Purnawarman P, Sukyadi D: Formative assessment and self-regulated learning during pandemic era; Tell: Teaching of English Language and Literature Journal (9); 2021:72; doi:10.30651/tell.v9i2.9305
25. Van Hai N: Vietnamese English teachers' views on formative assessment management and suggestions to improve student motivation; Linguistics and Culture Review (6); 2021:363-379; doi:10.21744/lingcure.v6ns1.2054

26. Bruun J, Evans RH: Network analysis of survey data to identify non-homogeneous teacher self-efficacy development in using formative assessment strategies; Education Sciences (10); 2020:54; doi:10.3390/educsci10030054
27. Ghaicha A, Oufela Y: Moroccan EFL secondary school teachers' current practices and challenges of formative assessment; Canadian Social Science (17); 2021:1-15; doi:10.3968/12015
28. Spruce R, Bol L: Teacher beliefs, knowledge, and practice of self-regulated learning; Metacogn Learn (10); 2015:245-277; doi:10.1007/s11409-014-9124-0
29. McNeish D, Wolf MG: Dynamic fit index cutoffs for confirmatory factor analysis models; Psychol Methods (28); 2023:61-88; doi:10.1037/met0000425
30. Kline RB: Principles and practice of structural equation modeling. In: Nichols AL, Edlund J, editors. The Cambridge handbook of research methods and statistics for the social and behavioral sciences: Building a program of research. Vol. 1. Cambridge: Cambridge University Press; 2023:535-558; ISBN:9781009010054
31. Zheng B, Bentler P: Enhancing model fit evaluation in SEM: Practical tips for optimizing chi-square tests; Structural Equation Modeling: A Multidisciplinary Journal; 2023; doi:10.48550/arXiv.2308.13939
32. Veugen MJ, Gulikers JTM, den Brok P: Secondary school teachers' use of formative assessment practice to create co-regulated learning; Journal of Formative Design in Learning (8); 2024:15-32; doi:10.1007/s41686-024-00089-9
33. Li J, Gu YP: Formative assessment for self-regulated learning: Evidence from a teacher continuing professional development programme; System (125); 2024:103414; doi:10.1016/j.system.2024.103414
34. Yang Y: Formative assessment: A significant facilitator of student learning; Science Insights Education Frontiers (20); 2024:3219-3221; doi:10.15354/sief.24.co267
35. Mäkipää T, Salo OP: Using self-assessment to enhance self-regulated learning – an intervention study in a Finnish lower secondary school; AFinLA-teema (15); 2023:19-39; doi:10.30660/afinla.125030
36. Andersson C, Granberg C: From passenger to pilot – using formative assessment to support students with intellectual disabilities to become self-regulated learners; Front Educ (7); 2022:845208; doi:10.3389/feduc.2022.845208
37. Ibarra-Sáiz MS, Rodríguez-Gómez G, Boud D: Developing student competence through peer assessment: The role of feedback, self-regulation and evaluative judgement; High Educ (80); 2020:137-156; doi:10.1007/s10734-019-00469-2
38. Veugen MJ, Gulikers JTM, den Brok P: We agree on what we see: Teacher and student perceptions of formative assessment practice; Studies in Educational Evaluation (70); 2021:101027; doi:10.1016/j.stueduc.2021.101027
39. Alenezy HM, Jiar YK, Kosnin AM: Predictors of teachers' self-efficacy for self-regulated learning among Saudi teachers; International Journal of Academic Research in Business and Social Sciences (12); 2022:3; doi:10.6007/ijarbss/v12-i3/12271
40. Jud J, Karlen Y, Hirt CN: Linking teachers' and students' motivation for self-regulated learning: Is there a signal and how is it transmitted?; Metacogn Learn; 2024; doi:10.1007/s11409-024-09393-y

41. Emiru EK, Gedifew MT: The effect of teacher self-efficacy on learning engagement of secondary school students; Cogent Education (11); 2024:2308432; doi:10.1080/2331186x.2024.2308432
42. de Ruig NJ, Zee M, de Jong PF: Understanding the interplay between teacher self-efficacy, teacher–student interactions, and students' self-regulated learning skills at different levels of classroom ecology; Front Educ (9); 2024:1392907; doi:10.3389/feduc.2024.1392907
43. Gao H, Li J, Lv M, Jian Z, Yun T, Pan H: Exploring teacher self-efficacy: A longitudinal study on the impact of lesson study in higher education; Preprints; 2024:1960; doi:10.20944/preprints202405.1960.v1
44. Wang A: The application of formative assessment to primary school English teaching; Learning & Education (10); 2022:21; doi:10.18282/l-e.v10i5.2660
45. Relampago JA: Academic optimism of teachers and self-regulated learning of students; International Journal of Management Studies and Social Science Research (6); 2024:249-253; doi:10.56293/ijmsssr.2024.5031
46. Abdulla A, Whipp PR, McSporran G, Teo T: An interventional study with the Maldives generalist teachers in primary school physical education: An application of self-determination theory; PLoS One (17); 2022:e0268098; doi:10.1371/journal.pone.0268098
47. Darwis M, Siregar YA, Siregar AK, Lubis LT, Pelangi H, Hermanto M: Development of teaching materials and training self efficacy teaching module on teacher performance of SMA/MA. In: 2nd Paris Van Java international seminar on health, economics, social science and humanities. KnE Social Sciences; 2023:299-308; doi:10.18502/kss.v8i4.12911
48. Myyry L, Koivisto A, Vuori J, Alasoini T, Karppinen A, Helkama K: How self-efficacy beliefs are related Myyry L, Koivisto A, Vuori J, Alasoini T, Karppinen A, Helkama K: How self-efficacy beliefs are related to assessment practices: A study of experienced university teachers; Assess Eval High Educ (47); 2022:155-168; doi:10.1080/02602938.2021.1887812
49. Ahmad I, Akbar RA: Examining relationship between self-efficacy beliefs of elementary level English teachers and their implementation practices of formative assessment in Punjab; Review of Education, Administration & Law (3); 2020:123-134; doi:10.47067/real.v3i2.44
50. DeLozier R: Impact of self-efficacy and percentage of English learners on implementation of instructional practices by secondary mathematics and science teachers; Sch Sci Math (122); 2022:311-323; doi:10.1111/ssm.12546
51. Zakariya YF, Adegoke NA: Teacher instructional practices: Untangling their complex relations with self-efficacy, job satisfaction, stress, and cooperation among mathematics teachers; Front Educ (9); 2024:1367076; doi:10.3389/feduc.2024.1367076
52. Liepa D, Ročāne M: Teacher's pedagogical self-efficacy for ensuring the quality of education; Education Innovation Diversity (1); 2024:79-85; doi:10.17770/eid2024.1.7933
53. Lam L, Lien VP, Hung LT, Vy NTP: Impact of professional development activities on teachers' formative assessment practices; International Journal of Evaluation and Research in Education (13); 2024:3028; doi:10.11591/ijere.v13i5.29588

54. Makeleni S, Mutongoza BH, Linake MA, Ndu OG: Teacher self-efficacy and learner assessment: A perspective from literature on South African indigenous languages in the foundation phase; Journal of Curriculum Studies Research (5); 2023:44-64; doi:10.46303/jcsr.2023.30
55. Yan Z, King RB: Assessment is contagious: The social contagion of formative assessment practices and self-efficacy among teachers; Assess Educ (30); 2023:130-150; doi:10.1080/0969594x.2023.2198676
56. Wu G, Zhang L: Longitudinal associations between teacher-student relationships and prosocial behavior in adolescence: The mediating role of basic need satisfaction; International Journal of Environmental Research and Public Health (19); 2022:14840; doi:10.3390/ijerph192214840
57. Miao J, Ma L: Teacher autonomy support influence on online learning engagement: The mediating roles of self-efficacy and self-regulated learning; Sage Open (13); 2023:4; doi:10.1177/21582440231217737
58. Ramli R, Nurahimah MY: Self-efficacy and differentiated instruction: A study among Malaysian school teachers; Universal Journal of Educational Research (8); 2020:1252-1260; doi:10.13189/ujer.2020.080416
59. Xiang X, Yum S, Lian R: Teachers' self-efficacy and formative assessment of students: Moderating role of school goal structure; Social Behavior and Personality: An International Journal (48); 2020:6; doi:10.2224/sbp.9208