PREFACE TO THE EDITION

It is with great pleasure that we present Volume 2, Issue 2 of the International Journal of Education Insights (IJEI). This issue brings together a collection of scholarly contributions that address some of the most pressing concerns in contemporary education, including technology-enhanced learning, family engagement, teacher professional development, critical thinking, differentiated instruction, and the pursuit of equitable and effective educational practices.

As educational systems worldwide continue to navigate rapid social, technological, and pedagogical transformations, the articles featured in this issue offer valuable insights into how schools, teachers, learners, and families can work together to create meaningful and impactful learning experiences. Collectively, these studies underscore the importance of evidence-informed decision-making and learner-centered approaches in fostering educational excellence.

The opening article examines the relationship between technology integration and student engagement in secondary education. Through a mixed-methods approach, the study demonstrates that technology can significantly enhance both learner engagement and academic achievement when supported by teachers' technological pedagogical content knowledge (TPACK) and equitable access to resources. The findings provide important guidance for educators and policymakers seeking to maximize the educational benefits of digital innovation.

The second contribution explores the role of parental involvement in shaping academic performance among primary school pupils. By highlighting the significance of home-based learning support, effective communication, and positive parenting practices, the study reinforces the enduring value of strong family–school partnerships in promoting student success.

Teacher learning and instructional quality are the focus of the third article, which investigates teachers' lived experiences of professional development. The phenomenological findings reveal that meaningful instructional improvement is best achieved through sustained, collaborative, and contextually relevant professional learning opportunities rather than isolated training events. The study offers important reflections on how educational institutions can better support teacher growth and professional practice.

Critical thinking, a cornerstone of twenty-first-century education, is examined in the fourth article through a classroom-based action research study. The findings demonstrate how cooperative learning strategies can effectively foster higher-order thinking skills, learner accountability, and deeper classroom engagement. This work contributes practical insights for educators seeking to cultivate analytical and reflective learners.

The final article investigates the impact of differentiated instruction in mixed-ability classrooms. The study provides compelling evidence that instructional differentiation can significantly improve learner achievement, particularly among lower-performing students, while helping to reduce achievement gaps. Its findings have meaningful implications for inclusive teaching practices and curriculum implementation.

Taken together, the articles in this issue reflect a shared commitment to improving educational quality through innovative pedagogy, collaborative partnerships, and responsive instructional practices. They highlight the interconnected roles of teachers, learners, families, and educational leaders in creating learning environments that are equitable, engaging, and conducive to academic success.

The Editorial Board extends its sincere appreciation to all authors, reviewers, and members of the editorial team whose dedication and scholarly contributions have made this issue possible. We hope that the research presented herein will inspire further inquiry, inform educational practice, and contribute to ongoing efforts to enhance teaching and learning across diverse educational contexts.

We are delighted to share this issue with our readers and trust that it will serve as a valuable resource for researchers, educators, policymakers, and students committed to advancing educational knowledge and practice.

Dr. Bincy O.G
Chief Editor

CONTENTS

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Technology Integration and Student Engagement in Secondary Education: A Mixed-Methods Study

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Abstract

Despite substantial investments in classroom technology, evidence regarding its impact on student engagement and academic achievement remains inconsistent. This study examined the relationship between technology integration and student engagement, and the moderating role of teachers' technological pedagogical content knowledge (TPACK), in secondary classrooms. Using a mixed-methods sequential explanatory design, quantitative data were collected from 320 students and 40 teachers across six public secondary schools, while qualitative data were obtained through semi-structured interviews with 12 teachers. Pearson correlation and multiple regression analyses revealed a statistically significant positive relationship between technology integration and overall student engagement ($r = .62$, $p < .01$), with technology integration explaining 28% of the variance in academic achievement ($R^2 = .28$, $p < .01$). Thematic analysis of interview data identified three explanatory themes, namely pedagogical transformation, equity of access, and teacher professional confidence. The findings suggest that technology enhances learning when it is integrated through a TPACK-aligned pedagogy, supported by sustained professional development and equitable infrastructure. Implications for classroom practice, school leadership, and educational policy are discussed.

Keywords: - Technology Integration, Student Engagement, Academic Achievement, TPACK, Secondary Education, Mixed Methods

I. INTRODUCTION

The proliferation of digital tools, including interactive whiteboards, learning management systems, tablets, and adaptive applications, has transformed teaching and learning in the 21st-century classroom (Mishra & Koehler, 2006). Educational systems worldwide have responded by investing heavily in classroom technology, framing it as central to pedagogical innovation, equity, and lifelong learning (UNESCO, 2023). Yet the empirical evidence on its effectiveness remains divided. While some scholars report meaningful gains in motivation and achievement (Hattie, 2009; Tamim et al., 2011), others caution that technology, divorced from sound pedagogy, yields little measurable improvement in learning outcomes (Selwyn, 2016).

A persistent issue is that many teachers continue to use technology in superficial ways, primarily as a substitute for analog tools rather than as a means of pedagogical transformation (Puentedura, 2014). As a result, the anticipated gains in student engagement and achievement have not been universally realized. Few studies have systematically examined how teachers' pedagogical readiness mediates the relationship between technology integration and student outcomes, particularly in secondary classrooms in developing-country contexts. This gap is significant because secondary students are at a developmental stage in which engagement strongly predicts later academic trajectories and post-secondary aspirations (Fredricks et al., 2004).

The present study addresses this gap by investigating the relationship between technology integration, student engagement, and academic achievement in public secondary schools, while exploring the role of teacher pedagogical readiness as a moderating factor. The study is anchored on Vygotsky's (1978) sociocultural theory, which posits that learning

is mediated by tools and social interaction, and on the technological pedagogical content knowledge (TPACK) framework (Mishra & Koehler, 2006), which describes the knowledge teachers need to integrate technology meaningfully. Engagement is operationalized through Fredricks et al.'s (2004) tripartite model of behavioral, cognitive, and emotional engagement, widely regarded as a robust predictor of academic success. Hattie's (2009) synthesis of over 800 meta-analyses reports a moderate average effect size of technology on achievement ($d \approx 0.40$), with notably stronger effects when integration is paired with effective pedagogy and feedback. Tamim et al. (2011) similarly found positive but contextually variable outcomes, while Koehler et al. (2014) demonstrated that teachers' TPACK is a strong predictor of effective integration. The current study extends this body of work by focusing on the secondary-school level in a South Asian public-school context, where digital adoption is rapid but uneven.

II. OBJECTIVES OF THE STUDY

The general objective of the study was to examine the relationship between classroom technology integration, student engagement, and academic achievement in secondary education, and to identify the conditions under which this relationship is strengthened. Specifically, the study sought to:

- Determine the level of technology integration practiced by teachers in selected public secondary schools.
- Examine the relationship between technology integration and student engagement across its behavioral, cognitive, and emotional dimensions.
- Determine the extent to which technology integration predicts students' academic achievement when prior achievement and gender are statistically controlled.
- Identify the pedagogical, professional, and contextual factors that moderate the effectiveness of technology integration in the classroom.

III. METHODOLOGY

This study employed a mixed-methods sequential explanatory design, which combines quantitative and qualitative approaches in two successive phases (Creswell & Plano Clark, 2018). The first phase generated quantitative data to identify patterns of association between technology integration, engagement, and achievement, after which the second phase used qualitative interviews to interpret and explain those patterns in greater depth. This design was deemed appropriate because the research questions required both measurement of relationships and an understanding of the lived pedagogical experiences that produce them.

The study was conducted in six public secondary schools selected through stratified random sampling to ensure representation across urban, semi-urban, and rural settings. The quantitative sample comprised 320 students drawn proportionately from Grades 9 to 12, of whom 53% were female, and 40 classroom teachers with a mean teaching experience of 11.4 years. Sample size was determined using Cochran's (1977) formula at a 95% confidence level with a 5% margin of error. For the qualitative phase, 12 teachers were purposively selected on the basis of years of teaching experience and self-reported levels of technology integration, classified as low, moderate, or high, in order to capture variation in pedagogical practice.

Three instruments were used to gather data. The first was a Technology Integration Survey adapted from Schmidt et al.'s (2009) TPACK self-assessment instrument, which contained 24 items rated on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." The second was a Student Engagement Scale adapted from Fredricks et al. (2004), comprising 19 items measuring behavioral, cognitive, and emotional engagement on a 5-point scale. The third was a semi-structured interview guide developed by the researcher and refined after expert review. Academic achievement was operationalized through students' end-of-term grade point averages obtained from official school records. The instruments were content-validated by a panel of three educational research experts, and a pilot test with 30 students who did not participate in the main study yielded Cronbach's alpha values of .87 for the Student Engagement Scale and .91 for the Technology Integration Survey, indicating high internal consistency (Tavakol & Dennick, 2011).

Data collection followed institutional ethical clearance and obtained the informed consent of all participants and the parents of minor participants, in accordance with the ethical guidelines of the American Psychological Association (2017). Surveys were administered in person during regular class periods, with the researcher available to clarify items. Interviews lasted approximately 45 minutes each and were audio-recorded with the participants' written permission, then transcribed verbatim. Confidentiality was maintained through the use of pseudonyms, and participants were informed of their right to withdraw at any stage without consequence.

Quantitative data were analyzed using IBM SPSS Statistics Version 27. Descriptive statistics, including means, standard deviations, and percentages, were used to summarize the level of technology integration and student engagement. Pearson product-moment correlation coefficients were computed to examine relationships among the key variables. Multiple regression analysis was then conducted to determine the predictive value of technology integration on academic achievement, with prior achievement and gender entered as control variables. Assumptions of normality, linearity, multicollinearity, and homoscedasticity were checked and met. Qualitative data were analyzed using Braun and Clarke's (2006) six-phase reflexive thematic analysis, which involved familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Trustworthiness of the qualitative analysis was strengthened through member checking with three participants, peer debriefing with a fellow researcher, and the maintenance of a detailed audit trail (Lincoln & Guba, 1985).

IV. RESULTS

Descriptive analysis indicated a moderate level of technology integration in classrooms, with a mean score of 3.21 (SD = 0.74) on the 5-point scale. Teachers most frequently used technology for content presentation (78%), assessment (51%), and student research (44%), but rarely for collaborative knowledge construction (19%) or higher-order problem-solving (16%). Pearson correlation revealed a strong positive relationship between technology integration and overall student engagement (r = .62, p < .01). Disaggregated by dimension, the strongest association was with cognitive engagement (r = .67), followed by behavioral engagement (r = .58) and emotional engagement (r = .54). Multiple regression analysis indicated that technology integration was a significant positive predictor of academic achievement (β = .34, p < .01), accounting for 28% of the variance in students' grade point averages (R^2 = .28, F(3, 316) = 41.07, p < .001), even after controlling for prior achievement and gender.

Thematic analysis of the interview transcripts produced three interrelated themes that helped explain the quantitative findings. The first theme, pedagogical transformation, emerged from the accounts of teachers who reported high TPACK and described a clear shift from teacher-centered instruction toward student-centered, inquiry-driven learning, in which technology served as a thinking and collaboration tool rather than a delivery channel. The second theme, equity and access, captured the disparities in students' device availability and home internet connectivity, with several teachers noting that integration strategies had to be adjusted to avoid disadvantaging lower-income learners. The third theme, professional confidence, reflected the consistent observation that sustained, school-based professional development was associated with greater willingness to attempt innovative integration, whereas one-off training sessions were viewed as ineffective.

V. DISCUSSION

The findings affirm that technology integration is positively associated with student engagement and academic achievement in secondary classrooms, consistent with prior research (Hattie, 2009; Tamim et al., 2011). The strong association with cognitive engagement is particularly noteworthy, as it suggests that, when used purposefully, digital tools can promote deeper learning processes such as elaboration, organization, and metacognitive monitoring (Mayer, 2009). At the same time, the findings echo Selwyn's (2016) caution that technology's value depends on pedagogical purpose. The qualitative data made clear that effective integration was not driven by the presence of devices but by the quality of teachers' pedagogical decisions, a result that strongly supports Mishra and Koehler's (2006) TPACK framework. Teachers who lacked sufficient TPACK tended to use technology in low-level, substitutive ways consistent with the lower stages of Puentedura's (2014) SAMR model.

The equity finding reinforces UNESCO's (2023) warning that the digital divide remains a critical concern. Without deliberate effort, technology integration can exacerbate rather than alleviate educational inequalities. Schools must therefore pair technology investments with structural support for under-resourced learners. This study makes two main contributions. Empirically, it provides quantitative and qualitative evidence from a South Asian public-school context, where research on technology integration remains limited. Theoretically, it integrates the TPACK framework with Fredricks et al.'s (2004) engagement model, demonstrating that the engagement and achievement pathway depends substantially on teacher pedagogical readiness. Three limitations should nonetheless be noted. First, the cross-sectional design limits causal inference. Second, the sample, while diverse, was drawn from a single region. Third, academic achievement was measured using grade point averages, which may not fully capture higher-order learning outcomes. Future longitudinal and multi-regional studies are therefore warranted.

VI. CONCLUSION

Technology integration, when grounded in pedagogically sound practice and supported by adequate infrastructure, significantly enhances student engagement and academic achievement in secondary education. Teacher pedagogical capacity, particularly TPACK, emerges as the most decisive factor. Schools and policymakers seeking to maximize the educational value of digital tools should therefore invest as much in teacher development and equitable access as in hardware procurement. Future research should employ longitudinal designs to trace effects over time and explore primary and rural-school contexts.

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Parental Involvement and Academic Performance of Pupils in Public Primary Schools: A Correlational Study

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Abstract

Parental involvement has long been recognized as a critical determinant of children's school success, yet the strength and nature of its relationship with academic performance vary considerably across contexts. This study examined the relationship between parental involvement and the academic performance of pupils in public primary schools, with attention to which dimensions of involvement contribute most strongly to learning outcomes. A quantitative correlational design was adopted, with data collected from 280 pupils in Grades 4 to 6 and their 280 corresponding parents across eight public primary schools, selected through stratified random sampling. The Parental Involvement Questionnaire, adapted from Epstein's framework, and pupils' end-of-term grade averages obtained from school records were the principal data sources. Pearson correlation and multiple regression analyses were used to test the relationships. Results showed a statistically significant positive relationship between overall parental involvement and academic performance ($r = .57$, $p < .01$). Among the six dimensions, learning at home ($\beta = .31$), parenting ($\beta = .24$), and communicating ($\beta = .19$) were the strongest predictors, jointly explaining 41% of the variance in pupils' academic performance. Socioeconomic status and parental education moderated the relationship. The findings reinforce the value of structured family and school partnerships and call for systematic engagement strategies in primary education.

Keywords: - Parental Involvement, Academic Performance, Primary Education, Epstein Framework, Family-School Partnership

I. INTRODUCTION

The role of parents in children's schooling has been a central concern of educational research for several decades. Parental involvement, broadly defined as parents' participation in their children's educational processes both at home and in school, has been associated with a wide range of positive outcomes including higher academic achievement, better school attendance, improved behavior, and stronger motivation to learn (Epstein, 2018; Henderson & Mapp, 2002). Meta-analyses have consistently reported moderate to strong effects of parental involvement on academic outcomes across grade levels and cultural contexts (Fan & Chen, 2001; Jeynes, 2012).

Despite this substantial body of evidence, several issues remain unresolved. First, parental involvement is multidimensional, encompassing parenting practices, communication with the school, volunteering, learning at home, decision-making, and collaboration with the community (Epstein, 1995). The relative contribution of each dimension to pupils' academic performance is not uniform across studies. Second, much of the existing literature has been generated in Western and high-income contexts, while evidence from primary schools in South Asian public-school systems remains comparatively limited. Third, in many developing-country settings, parental engagement is constrained by factors such as low parental literacy, large class sizes, poverty, and weak school outreach, which together complicate the implementation of family-school partnerships (Bartolome et al., 2017).

The early years of schooling are a particularly important window for parental involvement, as foundational literacy, numeracy, and study habits are formed during this period and tend to predict later academic trajectories (Hoover-Dempsey &

Sandler, 1997). Strong family-school partnerships at this stage can offset disadvantages associated with socioeconomic status and home learning environments. Bronfenbrenner's (1979) ecological systems theory provides a useful lens for understanding why this is so, by situating the child at the center of nested systems in which family and school constitute the most proximal microsystems shaping development. Within this perspective, the quality of the connection between home and school, conceptualized as the mesosystem, exerts a particularly strong influence on academic and social outcomes.

The present study contributes to this literature by examining the relationship between parental involvement and academic performance among primary school pupils in a public-school context, identifying the specific dimensions of involvement that best predict performance, and exploring how socioeconomic factors moderate this relationship. The study is grounded in Epstein's (1995, 2018) six-dimension framework of parental involvement and informed by Hoover-Dempsey and Sandler's (1997) model of the parental involvement process, which explains why and how parents become involved in their children's schooling.

II. OBJECTIVES OF THE STUDY

The general objective of the study was to determine the relationship between parental involvement and the academic performance of pupils in public primary schools, and to identify the dimensions of involvement that most strongly predict pupils' performance. Specifically, the study sought to:

- Assess the level of parental involvement among parents of pupils in selected public primary schools, across the six dimensions of Epstein's framework.
- Determine the level of academic performance of pupils in the selected schools.
- Examine the relationship between overall parental involvement and pupils' academic performance.
- Identify which specific dimensions of parental involvement most strongly predict academic performance.
- Determine the moderating effects of parental education and household socioeconomic status on the relationship between parental involvement and academic performance.

III. METHODOLOGY

This study employed a quantitative correlational research design, which is appropriate for examining the strength and direction of relationships among variables without the manipulation of conditions (Creswell & Creswell, 2018). The design also permitted the use of multiple regression analysis to identify which dimensions of parental involvement contributed most to pupils' academic performance while statistically controlling for relevant background variables.

The study was conducted in eight public primary schools selected through stratified random sampling to ensure representation of urban, semi-urban, and rural localities. The participants comprised 280 pupils enrolled in Grades 4 to 6, of whom 51% were female, and their 280 corresponding parents or primary guardians, ensuring matched parent-pupil pairs. Sample size was determined using Krejcie and Morgan's (1970) table at a 95% confidence level. Pupils were selected through simple random sampling within the chosen grade levels, and their parents were subsequently invited to participate, with substitutions made only when consent could not be obtained.

Two main instruments were used to collect data. The first was a Parental Involvement Questionnaire adapted from Epstein's (1995) framework, comprising 36 items distributed across six dimensions, namely parenting, communicating, volunteering, learning at home, decision-making, and collaborating with the community. The items were rated on a 5-point Likert scale ranging from "never" to "always." The second source of data was pupils' academic records, specifically end-of-term grade point averages computed from teacher-administered assessments in core subjects. A short demographic form gathered information on parental education, occupation, household income bracket, and family structure, which served as control and moderator variables. The questionnaire was content-validated by a panel of three experts in educational research and was pilot-tested with 30 parents who did not participate in the main study, yielding a Cronbach's alpha of .89, which indicated high internal consistency (Tavakol & Dennick, 2011).

Data collection was carried out after securing institutional ethical clearance and obtaining permission from school administrators, written informed consent from parents, and assent from pupils, in line with the ethical principles of the American Psychological Association (2017). Questionnaires were distributed in person and were retrieved within seven days, with researcher-led briefings provided to parents with low literacy levels to support accurate completion. Pupils' records were obtained from school registrars in anonymized form, and identifying information was removed prior to analysis to safeguard confidentiality.

Quantitative data were analyzed using IBM SPSS Statistics Version 27. Descriptive statistics, including means, standard deviations, and percentages, were used to summarize the levels of parental involvement and academic performance. Pearson product-moment correlation coefficients were calculated to determine the strength and direction of the relationships between variables. Multiple regression analysis was used to identify the dimensions of parental involvement that best predicted academic performance, and hierarchical regression was applied to examine the moderating effects of parental education and socioeconomic status. Assumptions of normality, linearity, multicollinearity, and homoscedasticity were tested and met. Statistical significance was set at $p < .05$.

IV. RESULTS

Descriptive analysis indicated a moderate level of overall parental involvement ($M = 3.34$, $SD = 0.69$ on a 5-point scale). Across dimensions, parenting and communicating registered the highest mean scores ($M = 3.71$ and 3.52 respectively), while volunteering and decision-making registered the lowest ($M = 2.61$ and 2.74 respectively). The mean academic

performance of pupils, expressed as a grade point average on a 5-point scale, was 3.28 (SD = 0.71), which corresponds to a satisfactory level.

Pearson correlation analysis revealed a statistically significant positive relationship between overall parental involvement and pupils' academic performance (r = .57, p < .01). All six dimensions correlated positively and significantly with academic performance, with learning at home (r = .61), parenting (r = .49), and communicating (r = .42) showing the strongest associations.

Multiple regression analysis indicated that the six dimensions jointly explained 41% of the variance in pupils' academic performance (R^2 = .41, $F(6, 273) = 31.62$, p < .001). Learning at home (β = .31, p < .001), parenting (β = .24, p < .01), and communicating (β = .19, p < .05) emerged as the strongest unique predictors, while volunteering and decision-making did not reach statistical significance once the other dimensions were controlled.

Hierarchical regression analysis showed that parental education and household socioeconomic status significantly moderated the relationship between parental involvement and academic performance, increasing the explained variance by an additional 6% (ΔR^2 = .06, p < .01). The relationship was strongest among pupils whose parents had completed secondary education and whose households were in the middle-income bracket.

V. DISCUSSION

The findings of this study confirm that parental involvement is positively and substantially related to the academic performance of pupils in public primary schools, in line with longstanding evidence in the field (Fan & Chen, 2001; Henderson & Mapp, 2002; Jeynes, 2012). The strong predictive value of the learning-at-home dimension is particularly consistent with prior research suggesting that home-based academic support, including help with homework, reading together, and structured study routines, exerts a stronger influence on achievement than school-based forms of involvement such as volunteering or attending meetings (Castro et al., 2015; Jeynes, 2012). This pattern indicates that what parents do with their children at home matters more than how often they appear at the school gate.

The high explanatory weight of parenting practices supports Hoover-Dempsey and Sandler's (1997) argument that parents' role construction and self-efficacy beliefs translate into the everyday behaviors that shape children's academic dispositions. Communication between parents and teachers also emerged as a significant predictor, which is consistent with Epstein's (2018) emphasis on two-way information flow as a foundation for effective family-school partnerships.

The non-significance of volunteering and decision-making, after other dimensions were controlled, should be interpreted with caution. These forms of involvement may have indirect effects through school climate or social capital, even when their direct contribution to academic performance is limited (Coleman, 1988). The moderating role of parental education and socioeconomic status is also noteworthy, as it suggests that involvement strategies that work well in one context may need to be adapted in others. Schools serving low-income families may need to provide additional structures, such as parent literacy support, home-learning kits, and flexible communication channels, to enable meaningful involvement (Bartolome et al., 2017).

This study has at least three limitations. First, the cross-sectional design limits the ability to draw causal inferences. Second, parental involvement was measured through self-report, which may be subject to social desirability bias. Third, the focus on public primary schools in a single region limits generalizability. Future research could employ longitudinal and mixed-methods designs and extend the inquiry to private schools and rural settings.

VI. CONCLUSION

Parental involvement plays a meaningful role in shaping the academic performance of primary school pupils, with home-based learning support, sound parenting practices, and active parent-teacher communication exerting the strongest influence. Schools, policymakers, and parent-teacher associations should therefore prioritize structured strategies that strengthen these particular dimensions of involvement, while also addressing the socioeconomic and educational inequalities that constrain participation in less advantaged households. Investments in parental capacity-building are likely to yield substantial returns in pupil performance and, by extension, in long-term educational equity.

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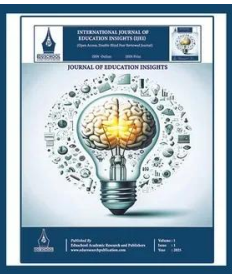

Teachers' Lived Experiences of Professional Development and Its Influence on Instructional Quality: A Phenomenological Study

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Abstract

Teacher professional development is widely promoted as a lever for instructional improvement, yet teachers' own experiences of how it shapes their classroom practice remain underexplored, particularly in public secondary school settings. This study investigated the lived experiences of teachers regarding professional development and its perceived influence on the quality of their instruction. A qualitative phenomenological design, anchored on Moustakas's (1994) transcendental phenomenological tradition, was adopted. Fifteen secondary school teachers with at least five years of teaching experience were purposively selected from four public schools and engaged in in-depth, semi-structured interviews and two focus group discussions. Data were analyzed through Moustakas's modified Stevick-Colaizzi-Keen method, involving epoché, horizonalization, clustering of meaning units, and the construction of textural and structural descriptions. Five essential themes emerged, namely fragmented exposure to one-off training, the transformative power of sustained collaborative learning, the role of school leadership in enabling instructional change, the gap between training content and classroom realities, and the centrality of reflection in translating learning into practice. The findings highlight the importance of sustained, contextually grounded, and collaborative professional development models, and argue that instructional quality is most strongly shaped by ongoing professional learning communities rather than episodic seminars.

Keywords: - Professional Development, Instructional Quality, Lived Experience, Phenomenology, Teacher Learning

I. INTRODUCTION

Teacher professional development is consistently identified as one of the most important policy and practice levers for raising the quality of teaching and, in turn, learner outcomes (Darling-Hammond et al., 2017). Yet decades of investment have yielded uneven results. Many teachers continue to describe professional development as fragmented, decontextualized, and disconnected from the classroom realities in which they work (Borko, 2004; Kennedy, 2016). Quantitative evaluations have produced inconsistent effects on instructional quality and student achievement, partly because professional development takes many forms and the conditions under which it succeeds are highly contextual.

To understand why some forms of professional development transform teaching while others do not, it is necessary to examine professional development as it is actually experienced by teachers. The literature offers strong frameworks for what effective professional development should look like, including a focus on content, active learning, coherence, sustained duration, and collective participation (Desimone, 2009). However, frameworks alone cannot explain how teachers internalize, resist, adapt, or repurpose professional development experiences in their everyday work. Phenomenological inquiry, which seeks to uncover the meaning of lived experience as it is consciously perceived by participants, is particularly suited to this gap (Moustakas, 1994; van Manen, 2014).

In many public-school systems, teachers attend a wide range of training activities ranging from one-off seminars and orientation workshops to school-based learning communities and online courses. The extent to which these experiences translate into improved planning, classroom delivery, assessment, and reflection, which together constitute instructional quality, depends on a complex interplay of personal disposition, institutional support, and professional culture (Fullan, 2016;

Vescio et al., 2008). Understanding this interplay from the inside requires methods that allow teachers to articulate the meanings they attach to their professional learning experiences.

The present study contributes to this conversation by exploring the lived experiences of secondary school teachers regarding professional development and the ways in which these experiences shape their instructional practice. The study is anchored on Mezirow's (1997) transformative learning theory, which posits that meaningful change in adult learners arises through critical reflection on disorienting experiences, and is informed by Desimone's (2009) framework of effective professional development as a heuristic for organizing the analysis of teacher accounts.

II. OBJECTIVES OF THE STUDY

The general objective of the study was to explore the lived experiences of secondary school teachers regarding professional development and the meanings they attach to its influence on the quality of their instruction. Specifically, the study sought to:

- Describe the range of professional development experiences encountered by secondary school teachers in their careers.
- Explore the meanings teachers attach to these professional development experiences.
- Identify the ways in which these experiences are perceived to shape teachers' planning, classroom delivery, assessment, and reflective practice.
- Examine the conditions that teachers identify as enabling or constraining the translation of professional learning into improved instruction.
- Surface the essential structure of the lived experience of professional development as a contributor to instructional quality.

III. METHODOLOGY

This study employed a qualitative phenomenological research design rooted in the transcendental phenomenological tradition developed by Moustakas (1994), which seeks to describe the essence of a shared lived experience as it is consciously perceived by those who have undergone it. The design was deemed appropriate because the research questions called for a deep, interpretive understanding of teachers' subjective accounts rather than the testing of relationships among variables. The phenomenological orientation also enabled the researcher to set aside preconceptions through the practice of epoché, allowing the participants' experiences to emerge as they were lived (Husserl, 1931).

The study was conducted in four public secondary schools situated in urban and semi-urban localities and selected for their representation of varied institutional cultures and professional development practices. Participants were 15 secondary school teachers selected through purposive criterion sampling, in line with Creswell and Poth's (2018) recommendation that 5 to 25 participants are sufficient for phenomenological inquiry. The inclusion criteria required participants to have at least five years of full-time teaching experience, current involvement in classroom instruction, and prior participation in at least three professional development activities of varied formats. The sample comprised nine female and six male teachers, with subject specializations spanning the sciences, humanities, and languages, and a mean teaching experience of 12.7 years.

Two main data collection methods were used. The primary method was an in-depth, semi-structured interview lasting approximately 60 minutes with each participant, conducted face to face in private rooms within the participants' schools. The interview guide was developed in line with phenomenological principles, beginning with broad invitations to recount professional development experiences and progressing to focused probes about meaning, perceived influence on instruction, and contextual conditions. The secondary method was two focus group discussions, with seven and eight participants respectively, designed to allow shared meanings and contrasting perspectives to emerge through dialogue. All interviews and focus group discussions were audio-recorded with written consent and transcribed verbatim.

The trustworthiness of the inquiry was established in line with Lincoln and Guba's (1985) criteria. Credibility was supported through prolonged engagement, member checking with five participants who reviewed their transcripts and the preliminary themes, and peer debriefing with a fellow educational researcher. Dependability was strengthened through a detailed audit trail documenting all methodological decisions. Transferability was addressed by providing thick descriptions of context and participants. Confirmability was supported by the practice of epoché, in which the researcher journaled assumptions and prior beliefs about professional development before and during data collection in order to bracket their influence on interpretation.

The study followed the ethical guidelines of the American Psychological Association (2017). Institutional ethical clearance was secured, and written informed consent was obtained from all participants after they were briefed on the purpose, voluntary nature, and confidentiality of the study, including their right to withdraw at any stage without consequence. Pseudonyms were assigned to participants and schools, and identifying details were removed from transcripts and analytic memos.

Data were analyzed through Moustakas's (1994) modified Stevick-Colaizzi-Keen method. The researcher first engaged in epoché, recording personal experiences and assumptions about professional development. Each transcript was then read multiple times to obtain a sense of the whole, after which significant statements relevant to the phenomenon were extracted in a process called horizonalization, in which all relevant statements are treated as equally significant. The statements were grouped into meaning units and clustered into themes. Textural descriptions were constructed to convey what participants had experienced, and structural descriptions were developed to capture how they had experienced it. Finally, textural and structural descriptions were synthesized into a composite essence statement representing the shared lived experience of the participants. The qualitative analysis software NVivo Version 14 was used to support data management, coding, and theme development.

IV. RESULTS

Five essential themes emerged from the analysis, each capturing a distinct facet of the shared lived experience while contributing to a unified composite essence.

The first theme, fragmented exposure to one-off training, captured the dominant pattern of professional development described by participants. Most teachers recounted attending short, often externally mandated workshops, summer in-service courses, and one-time seminars that introduced new ideas without subsequent follow-up, mentoring, or classroom application support. Participants described these experiences as informative but rarely transformative. As one participant remarked, repeated training sessions blurred together over the years, leaving fragments of ideas without a coherent professional growth pathway.

The second theme, the transformative power of sustained collaborative learning, captured a contrasting and more positive dimension of teachers' experiences. Participants who had taken part in school-based learning communities, peer-coaching arrangements, or sustained subject networks reported strong influences on their instructional practice. They described iterative cycles of trying ideas, observing peers, exchanging feedback, and refining lessons over time as the most powerful avenue through which their teaching changed. These accounts emphasized continuity, trust, and a sense of shared professional inquiry as distinguishing features.

The third theme, the role of school leadership in enabling instructional change, captured the perceived importance of principals and academic coordinators in shaping the conditions under which professional learning translates into instruction. Teachers spoke positively of leaders who protected time for professional dialogue, modeled instructional curiosity, and used supervision as developmental rather than evaluative. Conversely, environments in which leadership treated professional development as a compliance exercise were associated with low transfer of learning into classroom practice.

The fourth theme, the gap between training content and classroom realities, captured a recurring source of frustration. Participants described professional development sessions whose content was generic, theoretically dense, or pitched to ideal classroom conditions that bore little resemblance to their own large, mixed-ability, resource-constrained classes. The disjuncture often left teachers uncertain about how to translate ideas into their everyday work, particularly when training was delivered by facilitators with limited recent classroom experience.

The fifth theme, the centrality of reflection in translating learning into practice, captured the cognitive and emotional process through which teachers internalized and adapted professional learning. Participants who described their teaching as having improved most significantly were those who actively reflected on their practice through journals, post-lesson conversations with colleagues, or guided reflection within learning communities. Reflection emerged not as an optional add-on but as the mechanism through which abstract training content became personally meaningful and practically useful.

The composite essence statement that synthesized these themes is as follows: For these secondary school teachers, the lived experience of professional development as a contributor to instructional quality is one of episodic, often disconnected exposure to ideas, made transformative only when situated within sustained collaborative settings, supported by enabling school leadership, grounded in classroom realities, and made meaningful through ongoing reflective practice.

V. DISCUSSION

The findings of this study illuminate why teacher professional development so often falls short of its promise and what makes it effective when it succeeds. The dominance of fragmented, one-off training in participants' accounts confirms a long-standing critique of conventional professional development models (Borko, 2004; Kennedy, 2016) and resonates with Desimone's (2009) framework, which identifies sustained duration and coherence as essential features of effective professional development that are routinely absent from short workshops.

The strong presence of the theme on sustained collaborative learning supports the consistent finding in international research that professional learning communities, peer coaching, and lesson study yield more durable changes in instructional practice than discrete training events (Vescio et al., 2008). Teachers' descriptions of iterative cycles of trying, observing, and refining lessons closely mirror the conditions that adult learning theory identifies as conducive to meaningful change, including active engagement, social interaction, and connection to authentic problems of practice (Mezirow, 1997).

The emphasis participants placed on school leadership echoes Fullan's (2016) argument that the conditions for change are at least as important as the content of change. Leaders who treat supervision as developmental and who protect time for collaborative inquiry create the relational and structural infrastructure within which professional development takes root. The contrasting accounts of compliance-oriented environments serve as a cautionary reminder that policy investments in professional development are wasted when school cultures do not support the transfer of learning into practice.

The gap between training content and classroom realities is a particularly important finding for policy and program design. It suggests that professional development must be planned with deep knowledge of the actual teaching contexts in which participants work, including class size, learner diversity, and material constraints. Training that ignores these conditions risks being experienced as irrelevant, even when its content is intellectually sound.

Finally, the centrality of reflection underscores that professional development is not transmitted but constructed. Teachers translate inputs into improved instruction through cognitive and emotional processes that require time, structure, and a sense of professional safety. Schools that build reflective routines into their professional learning are likely to see more durable improvements in instructional quality than those that rely on intellectual content alone.

The study has several limitations. The use of a small purposive sample, while appropriate for phenomenological inquiry, limits statistical generalizability. The reliance on self-report introduces the possibility of recall and social desirability biases. The study also focused on secondary school teachers with at least five years of experience, and the experiences of novice teachers and primary school teachers may differ. Future research could extend the inquiry to these populations and integrate observational data on instructional practice to triangulate teachers' accounts.

VI. CONCLUSION

The lived experiences of secondary school teachers reveal that professional development influences instructional quality not through the accumulation of training events but through sustained, collaborative, contextually grounded, and reflectively engaged learning experiences. Episodic exposure to ideas, though common, contributes little to enduring instructional change. Schools, school systems, and policymakers seeking to raise instructional quality should therefore reconfigure professional development around school-based learning communities, supported by enabling leadership, content that respects classroom realities, and routines that institutionalize reflective practice. Investments aligned with these conditions are likely to yield significantly stronger returns than continued reliance on one-off seminars.

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Enhancing Learners' Critical Thinking Skills through Cooperative Learning Strategies: A Classroom-Based Action Research

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Abstract

The cultivation of critical thinking is widely recognized as a central goal of 21st-century education, yet many classrooms continue to privilege rote learning and lower-order cognitive tasks. This study explored how cooperative learning strategies, implemented systematically over time, can enhance learners' critical thinking skills in a Grade 10 social studies classroom. A classroom-based action research design, anchored on the Kemmis and McTaggart (2014) spiral of planning, acting, observing, and reflecting, was employed across three cycles spanning 12 weeks. The participants comprised 36 Grade 10 learners and the teacher-researcher. Data were collected through a critical thinking pre-test and post-test based on the Watson-Glaser-style item set, structured classroom observations, learners' written outputs, and the teacher-researcher's reflective journal. Quantitative data were analyzed using descriptive statistics and a paired-samples *t* test, and qualitative data were analyzed thematically. Results showed a statistically significant improvement in learners' critical thinking scores between the pre-test and post-test ($t(35) = 8.42$, $p < .001$, $d = 1.40$), with the strongest gains observed in evaluation and inference. Qualitative findings highlighted the role of structured cooperative tasks, learner accountability, and teacher questioning in deepening reasoning. Implications for classroom practice, teacher self-improvement, and the integration of cooperative learning into the secondary curriculum are discussed.

Keywords: - Cooperative Learning, Critical thinking, Action Research, Secondary Education, Teacher Inquiry

I. INTRODUCTION

The cultivation of critical thinking, that is, the disciplined process of analyzing, evaluating, inferring, and reasoning about information in a reflective and purposeful manner, has long been recognized as a central goal of education (Ennis, 1996; Facione, 2011). Within the broader 21st-century skills agenda, it occupies a particularly important position alongside communication, collaboration, and creativity (Trilling & Fadel, 2009). Yet many classrooms continue to emphasize the recall of facts and the completion of low-level cognitive tasks, leaving learners with limited opportunities to engage deeply with content, weigh competing claims, or construct reasoned arguments.

Cooperative learning, which involves learners working together in structured small groups toward a shared goal, has been advocated as a powerful pedagogical strategy for promoting both academic achievement and higher-order thinking (Johnson & Johnson, 2009; Slavin, 2014). Drawing on social constructivist principles articulated by Vygotsky (1978), cooperative learning posits that knowledge is constructed through dialogue, negotiation, and joint problem-solving with more capable peers and supportive teachers. When well structured, cooperative tasks can scaffold the kind of cognitive elaboration, perspective-taking, and reasoned argumentation that critical thinking requires (Gillies, 2016).

Despite the well-established theoretical basis for cooperative learning, its translation into routine classroom practice remains uneven. Many teachers report challenges in designing tasks that require genuine interdependence, distributing accountability, and managing groups of mixed ability and motivation (Buchs et al., 2017). Without these structural features, group work risks collapsing into surface collaboration or unequal participation, which yields limited cognitive benefit. Action research, with its emphasis on the practitioner-researcher iteratively planning, acting, observing, and reflecting on classroom

interventions, offers a particularly suitable methodological framework for refining and evaluating cooperative learning in real classroom conditions (Kemmis & McTaggart, 2014).

The present study was undertaken by the teacher of a Grade 10 social studies class to investigate how cooperative learning strategies, designed and refined over multiple cycles, can enhance learners' critical thinking skills. The study is theoretically anchored on Vygotsky's (1978) sociocultural theory and Johnson and Johnson's (2009) social interdependence theory, with critical thinking conceptualized through Facione's (2011) core dimensions of interpretation, analysis, evaluation, inference, explanation, and self-regulation.

II. OBJECTIVES OF THE STUDY

The general objective of the study was to enhance learners' critical thinking skills through the systematic implementation and refinement of cooperative learning strategies in a Grade 10 social studies classroom. Specifically, the study sought to:

- Determine learners' baseline critical thinking skills before the implementation of cooperative learning strategies.
- Design and implement cooperative learning interventions across three iterative action research cycles.
- Compare learners' critical thinking performance before and after the intervention period.
- Identify which cooperative learning structures and instructional moves contribute most to the development of critical thinking.
- Document the teacher-researcher's professional learning and the practical adjustments needed to sustain effective cooperative learning in routine classroom conditions.

III. METHODOLOGY

This study employed a classroom-based action research design framed by the Kemmis and McTaggart (2014) spiral of planning, acting, observing, and reflecting. Action research was deemed appropriate because the inquiry was undertaken by the classroom teacher in the very setting in which the intervention was to take effect, with the dual goals of generating practical improvement and producing transferable insight. The cyclical structure permitted the deliberate refinement of cooperative learning strategies in response to ongoing observations and reflective analysis, rather than testing a single fixed intervention.

The study was conducted in one Grade 10 social studies class consisting of 36 learners, of whom 19 were female and 17 were male, in a public secondary school. The teacher-researcher had taught the class for the entire academic year prior to the intervention, which provided ecological validity but also required reflexive vigilance to mitigate the bias inherent in researching one's own practice. The class represented a typical mixed-ability group, with prior academic performance distributed approximately along a normal curve.

The action research was implemented over 12 weeks across three cycles of four weeks each. The first cycle introduced foundational cooperative learning structures, namely Think-Pair-Share, Numbered Heads Together, and basic Jigsaw, embedded in lesson units on social institutions and governance. The second cycle deepened cooperative engagement by introducing structured controversy and Group Investigation tasks designed to require learners to analyze multiple perspectives and build evidence-based arguments. The third cycle integrated peer assessment, structured argumentation protocols, and Socratic questioning into cooperative tasks in order to foreground evaluative and inferential reasoning. Each cycle concluded with a reflective phase in which the teacher-researcher analyzed observations, learner outputs, and journal entries, and used the insights to redesign the subsequent cycle.

Multiple data collection methods were used to triangulate evidence, in line with action research practice (Stringer, 2014). The first source was a critical thinking test consisting of 30 items modeled on Watson-Glaser-style assessments, addressing inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. The test was content-validated by a panel of three expert teachers and pilot-tested with a non-participating Grade 10 class of 30 learners, yielding a Kuder-Richardson 20 reliability coefficient of .82. The second source was a structured classroom observation protocol completed by a colleague during selected cooperative learning lessons, capturing dimensions such as positive interdependence, individual accountability, equal participation, and quality of academic discourse. The third source was a corpus of learners' written outputs from cooperative tasks, including argument maps, position papers, and peer-evaluation responses. The fourth source was the teacher-researcher's reflective journal, maintained throughout the intervention to record observations, decisions, doubts, and insights at the end of each lesson and cycle.

The trustworthiness of the qualitative components was strengthened in line with Lincoln and Guba's (1985) criteria. Credibility was supported through methodological triangulation, peer debriefing with a colleague who served as a critical friend throughout the cycles, and member checking with learners during cycle transitions. Dependability was reinforced through a detailed audit trail of cycle plans, reflective entries, and analytic memos. Confirmability was supported by the researcher's reflexive journal, which documented assumptions and decisions throughout the process. Transferability was addressed through thick description of context, learners, and instructional moves.

The study followed the ethical guidelines of the American Psychological Association (2017). Institutional ethical clearance was obtained, and written informed consent was secured from parents, with assent obtained from the learners themselves. The intervention was delivered to the entire class as part of regular instruction, and learners were assured that participation in the research components, such as the test and reviewed outputs, would not affect their grades. Pseudonyms were used in all reports, and data were stored securely.

Data were analyzed using both quantitative and qualitative approaches. Quantitative analysis using IBM SPSS Statistics Version 27 included descriptive statistics for pre-test and post-test scores, a paired-samples *t* test to determine the significance of the change, and Cohen's *d* to estimate the magnitude of the effect. Subscale scores corresponding to the dimensions of critical thinking were examined to identify the areas of greatest and least improvement. Qualitative data from observations,

learner outputs, and the reflective journal were analyzed thematically using Braun and Clarke's (2006) reflexive thematic analysis, with codes and themes refined progressively across cycles. Quantitative and qualitative findings were integrated at the interpretation stage in order to construct a coherent account of how and why cooperative learning influenced critical thinking.

IV. RESULTS

Pre-test results indicated a moderate baseline level of critical thinking among learners, with a mean score of 14.11 out of 30 (SD = 3.92), or approximately 47%. Performance was strongest on items assessing interpretation and weakest on items assessing evaluation of arguments and inference, suggesting that learners could identify information but had difficulty weighing the soundness of arguments or drawing supported conclusions from data.

Post-test results recorded a substantial improvement, with a mean score of 21.47 out of 30 (SD = 4.18), or approximately 72%. The paired-samples t test indicated that the difference was statistically significant ($t(35) = 8.42$, $p < .001$), and Cohen's d of 1.40 indicated a large practical effect. Subscale analysis showed that the largest gains were achieved on evaluation of arguments (Mgain = 2.61) and inference (Mgain = 2.34), the very dimensions that had registered the lowest baseline scores. Gains were more modest on interpretation and recognition of assumptions, although still positive.

Qualitative analysis revealed four interrelated themes that helped explain the quantitative gains. The first theme, the structuring power of cooperative protocols, captured the consistent observation that protocols such as Think-Pair-Share, structured controversy, and Group Investigation provided learners with predictable cognitive routines that scaffolded reasoning. Learner outputs evolved from descriptive statements in the early weeks to position papers with evidence and counter-arguments in the later weeks. The second theme, the role of accountability in deepening engagement, captured the shift observed once individual accountability mechanisms, such as randomly selected reporters and individual reflective entries, were introduced in the second cycle. Observation notes recorded a marked decrease in passive participation and an increase in dispersed contribution. The third theme, the catalytic effect of teacher questioning, highlighted the influence of moves such as "what is the strongest counter-argument?" and "what evidence would change your mind?", which appeared to redirect learner reasoning toward evaluation and inference. The fourth theme, productive struggle and metacognition, captured learners' growing willingness to revise their thinking, articulate uncertainty, and explain their reasoning processes, particularly in the third cycle.

The teacher-researcher's reflective journal documented a parallel professional learning trajectory. Early entries focused on managerial concerns such as group composition, time allocation, and noise. Mid-intervention entries shifted toward instructional concerns such as the design of cognitively demanding tasks and the calibration of teacher questioning. Final entries reflected a more integrated stance in which task design, group structures, accountability, and questioning were viewed as interlocking levers for promoting critical thinking.

V. DISCUSSION

The findings indicate that cooperative learning, when systematically structured and refined across iterative cycles, produces substantial improvements in learners' critical thinking skills. The large effect size, d = 1.40, exceeds the typical effects reported for cooperative learning in international research (Slavin, 2014) and aligns with the broader evidence that well-designed cooperative tasks can promote higher-order thinking by leveraging social interaction and cognitive elaboration (Gillies, 2016; Vygotsky, 1978). The pattern of gains, in which the largest improvements were registered in evaluation and inference, is particularly significant because these dimensions are widely considered the most demanding and the least developed in conventional classrooms (Facione, 2011).

The qualitative findings clarify the conditions under which cooperative learning produces these gains. Structured protocols emerged as essential for translating the principle of cooperation into reliable cognitive routines, supporting Johnson and Johnson's (2009) emphasis on positive interdependence and individual accountability as defining features of effective cooperative learning. The catalytic role of teacher questioning resonates with research on dialogic teaching and Socratic instruction, which highlights how strategically posed questions provoke the analytical and evaluative work characteristic of critical thinking (Alexander, 2018). The emergence of productive struggle and metacognition by the third cycle suggests that learners had begun to internalize habits of reasoning rather than merely complying with task formats.

The cyclical structure of action research proved especially valuable for surfacing the challenges of implementation in real classroom conditions. The first cycle revealed problems of unequal participation and time pressure that were not anticipated at the planning stage. The second cycle addressed these through accountability mechanisms but exposed new challenges related to task complexity and learner readiness. The third cycle integrated lessons from the previous two and represented the most coherent enactment of cooperative learning. This trajectory underscores the central insight of action research, namely that pedagogical innovations rarely succeed in their first form and require iterative refinement informed by classroom evidence and reflection (Kemmis & McTaggart, 2014).

This study has several limitations. First, the sample comprised a single intact class taught by the teacher-researcher, which limits generalizability and introduces the possibility of researcher bias despite the safeguards used. Second, the absence of a control group precludes strict causal inference; gains may reflect maturation, instructional intensity, or other unmeasured factors in addition to the cooperative structures themselves. Third, the critical thinking test, although carefully constructed, captures a particular set of dimensions and may not reflect transfer to other domains. Future research could employ multi-class action research collaborations, comparative designs, and broader assessments of critical thinking transfer across subject areas.

VI. CONCLUSION

Cooperative learning, when systematically structured around principles of positive interdependence, individual accountability, and rigorous teacher questioning, significantly enhances learners' critical thinking skills, particularly in evaluation and inference. The action research process not only improved learner outcomes but also deepened the teacher-researcher's professional understanding of how cooperative tasks function and how they need to be refined to be effective. Schools and teacher-education programs should therefore equip teachers with both the technical skill to design cooperative tasks and the reflective stance required to refine them in practice. Sustained classroom-based inquiry, supported by collegial collaboration and adequate planning time, offers a particularly promising pathway for embedding critical thinking development into routine secondary school instruction.

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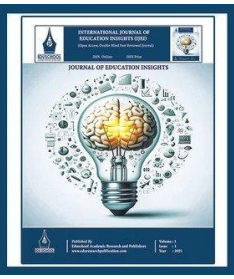

Effects of Differentiated Instruction on Learner Achievement in Mixed-Ability Classrooms: A Quasi-Experimental Study

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Abstract

The diversity of learners in contemporary classrooms has placed increasing pressure on teachers to adapt instruction to varied readiness levels, interests, and learning profiles. Differentiated instruction has been widely advocated as a pedagogical response, yet rigorous experimental evidence of its effectiveness in mixed-ability classrooms remains limited, particularly in mainstream public-school settings. This study examined the effect of differentiated instruction on learner achievement in mixed-ability classrooms in junior secondary schools. A quasi-experimental, non-equivalent control group design with pre-test and post-test measures was employed. Two intact Grade 8 classes ($N = 78$) were assigned to an experimental group exposed to a six-week differentiated instruction program and a control group taught through conventional whole-class instruction. Achievement was measured using a researcher-constructed test validated by experts and pilot-tested for reliability. Independent-samples t tests, analysis of covariance (ANCOVA), and effect-size estimation were used to analyze the data. The experimental group recorded significantly higher post-test scores than the control group ($F(1, 75) = 28.41$, $p < .001$, partial $\eta^2 = .27$, $d = 0.94$), indicating a large practical effect. Gains were strongest among low-achieving learners, suggesting that differentiated instruction narrows performance gaps in mixed-ability classrooms. Implications for instructional planning, teacher preparation, and curriculum policy are discussed.

Keywords: - Differentiated Instruction, Learner Achievement, Mixed-Ability Classrooms, Quasi-Experimental Design, Secondary Education

I. INTRODUCTION

Classrooms today are characterized by increasing diversity in learners' academic readiness, interests, language backgrounds, and learning profiles (Tomlinson, 2017). The persistent challenge for teachers is to deliver instruction that is responsive to this diversity without compromising the curriculum's depth or rigor. Traditional one-size-fits-all instruction has been widely criticized for under-serving both struggling and high-achieving learners, as it tends to pace lessons to the perceived middle of the class while leaving students at the extremes either bored or overwhelmed (Subban, 2006).

Differentiated instruction has emerged as a leading pedagogical response to this challenge. Tomlinson (2017) defines it as a teacher's proactive response to learners' needs, expressed through systematic variation in content, process, product, and learning environment, in order to meet learners at their respective readiness levels. The approach is grounded in Vygotsky's (1978) zone of proximal development, which highlights the importance of pitching instruction within the range where learners can succeed with appropriate support, and in Gardner's (1983) theory of multiple intelligences, which acknowledges the variety of ways in which learners process and demonstrate understanding.

Empirical studies have generally supported the effectiveness of differentiated instruction in raising achievement and engagement (Bondie et al., 2019; Pozas et al., 2020). Hattie's (2009) syntheses suggest that strategies aligned with differentiation, such as formative assessment, flexible grouping, and feedback, exert moderate to large effects on learning outcomes. However, several reviews caution that differentiated instruction is conceptually broad, complex to implement consistently, and demanding of teacher expertise, time, and institutional support (Smale-Jacobse et al., 2019). Many teachers

report difficulty translating the principle of differentiation into daily classroom routines, particularly in large or under-resourced classes.

Within South and Southeast Asian educational contexts, evidence on differentiated instruction at the secondary school level remains comparatively limited, although policy reforms increasingly emphasize learner-centered pedagogy. The present study contributes to this body of evidence by testing the effect of a structured differentiated-instruction program on learner achievement in mixed-ability junior secondary classrooms, while also examining whether the approach narrows performance gaps among learners of different initial achievement levels. The study is anchored on Tomlinson's (2017) framework of differentiated instruction and informed by Vygotsky's (1978) sociocultural theory and Gardner's (1983) multiple intelligences theory.

II. OBJECTIVES OF THE STUDY

The general objective of the study was to determine the effect of differentiated instruction on learner achievement in mixed-ability classrooms, and to examine whether the approach yields equitable gains across achievement levels. Specifically, the study sought to:

- Determine the pre-test and post-test achievement levels of learners in the experimental and control groups.
- Compare the post-test achievement of learners exposed to differentiated instruction with that of learners taught through conventional whole-class instruction.
- Estimate the magnitude of the effect of differentiated instruction on learner achievement.
- Determine whether the effect of differentiated instruction differs across high-achieving, average, and low-achieving learners.
- Identify pedagogical practices within differentiated instruction that contribute most to observed learning gains.

III. METHODOLOGY

This study employed a quasi-experimental, non-equivalent control group design with pre-test and post-test measures. The design was deemed appropriate because random assignment of learners to groups was not feasible in an authentic school setting, where intact classes are administratively fixed (Creswell & Creswell, 2018). The design nonetheless permitted controlled comparison between groups while preserving ecological validity.

The study was conducted in a public junior secondary school selected through purposive sampling on the basis of its mixed-ability enrolment and the principal's willingness to host the intervention. Two intact Grade 8 classes participated, with one randomly designated as the experimental group ($n = 39$) and the other as the control group ($n = 39$). The two classes were comparable in age, gender distribution, and prior academic performance, as confirmed by an independent-samples t test on baseline grades ($t(76) = 0.43$, $p = .67$). Both classes were taught the same English Language unit on reading comprehension and grammar by teachers with comparable qualifications and experience, who were trained by the researcher prior to the intervention.

Two main instruments were used to gather data. The first was the Reading and Language Achievement Test, a 40-item researcher-constructed instrument aligned with the curriculum learning competencies, comprising multiple-choice and short-response items distributed across the cognitive domains of remembering, understanding, applying, and analyzing in line with Anderson and Krathwohl's (2001) revised Bloom's taxonomy. The second was a structured observation checklist used by the researcher to monitor fidelity of implementation in the experimental class. The achievement test was content-validated by a panel of three teachers and one curriculum specialist, and was pilot-tested with a non-participating Grade 8 class of 30 learners. The pilot data yielded a Kuder-Richardson 20 reliability coefficient of .84, indicating high internal consistency, and item analysis confirmed acceptable difficulty and discrimination indices.

The intervention lasted six weeks, with five 40-minute sessions per week. The experimental group was taught through differentiated instruction, in which content was tiered to three readiness levels, processes included flexible grouping and choice boards, and products allowed varied modes of demonstrating mastery, including written, oral, and visual outputs. The classroom environment incorporated routines for self-pacing and peer support. The control group received conventional whole-class instruction with uniform tasks, pacing, and outputs, taught by the same lesson sequence and using the same materials minus the differentiation features. Both groups completed the achievement test as a pre-test in the week preceding the intervention and again as a post-test in the week immediately after.

The study followed the ethical guidelines of the American Psychological Association (2017). Institutional ethical clearance, school administrative approval, parental informed consent, and learner assent were obtained prior to data collection. Confidentiality was maintained through the use of code numbers, and the control group received an abridged differentiated-instruction unit at the conclusion of the study to ensure equity of educational opportunity.

Quantitative data were analyzed using IBM SPSS Statistics Version 27. Descriptive statistics summarized pre-test and post-test scores. Independent-samples t tests examined baseline equivalence and post-test differences between groups. Analysis of covariance (ANCOVA), with pre-test scores as the covariate, was used to test the main hypothesis while controlling for any residual baseline differences. Effect sizes were estimated using partial eta squared and Cohen's d, interpreted in line with Cohen's (1988) conventions. To examine whether gains differed across achievement levels, learners were classified into low, average, and high achievers based on pre-test scores, and a two-way analysis of variance was conducted with group and achievement level as factors. Assumptions of normality, homogeneity of variance, and homogeneity of regression slopes were tested and met. Statistical significance was set at $p < .05$.

IV. RESULTS

Pre-test scores indicated baseline equivalence between the experimental and control groups, with mean scores of 19.74 (SD = 5.21) and 19.36 (SD = 5.04) respectively, and no statistically significant difference ($t(76) = 0.33$, $p = .74$). Following the six-week intervention, post-test scores diverged considerably. The experimental group recorded a mean post-test score of 30.92 (SD = 5.74), compared with 24.10 (SD = 5.39) for the control group.

Independent-samples t test confirmed that the post-test difference was statistically significant ($t(76) = 5.42$, $p < .001$). Analysis of covariance, controlling for pre-test scores, similarly indicated a significant main effect of instructional approach on post-test achievement ($F(1, 75) = 28.41$, $p < .001$, partial $\eta^2 = .27$). Cohen's d of 0.94 indicated a large practical effect.

Two-way analysis of variance revealed a significant interaction between instructional approach and prior achievement level ($F(2, 72) = 4.62$, $p = .013$, partial $\eta^2 = .11$). Low-achieving learners in the experimental group showed the largest mean gain (Mgain = 13.21), followed by average achievers (Mgain = 11.07) and high achievers (Mgain = 9.82). In the control group, gains were comparatively modest and least pronounced among low achievers. These patterns suggest that differentiated instruction not only produced higher overall gains but also narrowed the performance gap among learners of different readiness levels.

The implementation fidelity checklist confirmed that 92% of the planned differentiation components were enacted as intended. Practices most frequently associated with high-quality lessons, as recorded in the observation logs, were tiered tasks aligned with readiness levels, flexible grouping for guided practice, and varied product options for the assessment of understanding.

V. DISCUSSION

The findings demonstrate that differentiated instruction produced significantly higher learning gains than conventional whole-class instruction in a mixed-ability junior secondary classroom. The large effect size, d = 0.94, exceeds the typical effects reported in educational interventions, which average around d = 0.40 (Hattie, 2009), and aligns with the more focused effects reported in recent reviews of differentiation (Bondie et al., 2019; Smale-Jacobse et al., 2019). The result supports Tomlinson's (2017) assertion that responsive instruction, when grounded in clear learning goals and ongoing formative assessment, can yield substantial improvements in achievement.

The strongest gains observed among low-achieving learners are pedagogically and ethically significant. They suggest that differentiated instruction operates not merely as an enrichment strategy but as an equity strategy capable of closing performance gaps in mixed-ability classrooms. This pattern is consistent with Vygotsky's (1978) zone of proximal development, in that tiered tasks and scaffolded support pitched instruction within the reach of struggling learners while continuing to challenge those at higher readiness levels. The varied product options also align with Gardner's (1983) thesis that learners demonstrate understanding through multiple modalities, broadening the avenues through which competence can be exhibited.

The finding that high achievers gained less than low achievers should not be interpreted as a ceiling effect against advanced learners but rather as the natural result of the test's difficulty range and the substantial distance lower-achieving learners had to travel. Future studies might use achievement tests with greater discrimination at the upper range to more sensitively detect gains among high achievers.

This study has several limitations. First, the use of intact classes, although necessary in school settings, limits the strength of causal inference. Second, the intervention period of six weeks captured short-term effects; longer interventions and follow-up assessments are needed to determine retention. Third, the study was conducted in a single subject area in one school, which limits generalizability. Fourth, although fidelity of implementation was monitored, the influence of teacher quality cannot be entirely ruled out. Future research could employ randomized cluster designs, broader subject coverage, and multiple sites to extend these findings.

VI. CONCLUSION

Differentiated instruction significantly improves learner achievement in mixed-ability classrooms and offers particular promise as a strategy for narrowing performance gaps among learners of different readiness levels. The combination of tiered tasks, flexible grouping, and varied products allows teachers to address the diversity of their learners while maintaining curricular integrity. Schools and teacher-education programs should therefore prioritize structured training in differentiated instruction, supported by adequate planning time, instructional resources, and school leadership. Future research should explore the long-term effects of differentiated instruction across subjects, grade levels, and contexts, and should examine how teacher development, class size, and school culture mediate its successful implementation.

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