**Moderating effect of In-service training between classroom management and students’ engagement of selected secondary schools of Kumba 1 municipality**

**Abstract:** The current study aimed at investigating the influence of classroom management on students’ engagement in learning and the moderating role of in-service training among selected Secondary schools in kumba 1 municipality. Specifically, it was purposed to find out the influence of exploratory teaching methods and students’ engagement in learning, to investigate how communication influences students’ engagement in learning, to determine the effect of reinforcement on students’ engagement in learning, to explore the influence of classroom environment on students’ engagement in learning and to examine the moderating role of in-service training in the relationship between classroom management and students’ engagement in learning. By use of a status cross-sectional quantitative research design, data for 132 secondary school students’ and 20 teachers in Kumba 1 municipality gathered using questionnaires. Data was analyzed using SPSS PROCESS macro. The results showed that exploratory teaching methods and classroom environment have significant positive influences on students’ engagement in learning. Thus, these findings emphasize the importance of learner-centered pedagogy and conducive classroom settings in promoting active learning. On the contrary, reinforcement and communication did not show statistically significant effects, although communication showed a near-significant positive trend. The findings further suggest that effective classroom management can substantially improve student engagement, particularly when mediated through continuous in-service training. Thus, comprehensive classroom management remain crucial for enhancing student engagement in learning.

**Keywords:** Classroom Management, Students’ engagement, in-service training, moderating variable

**Introduction**

Classroom management has evolved significantly over time, reflecting changes in educational philosophies, societal norms, and pedagogical approaches. Initially, classroom management focused on discipline and control, with strict rules and punishment for non-compliance (Jones, 2007). In the late 19th and early 20th centuries, the ‘teacher-centered’ approach prevailed, emphasizing authority and obedience (Evertson & Weinstein, 2006). However, in the mid-20th century, progressive educators like John Dewey advocated for a more student-centered approach, promoting active learning and individualized instruction (Dewey, 1938; Freiberg & Driscoll, 2005). This led to a shift in classroom management towards fostering collaboration, critical thinking, and self-regulation (Marzano & Marzano, 2003).With the advent of technology and globalization in the late 20th and early 21st centuries, classroom management evolved to incorporate digital tools and cross-cultural understanding. Teachers began integrating technology into lessons and adapting management strategies to address emerging issues such as cyberbullying and digital distractions (Lewin *et al.,* 2009). Today, classroom management continues to evolve, with an emphasis on creating inclusive, culturally responsive learning environments that cater to diverse student needs and promote social-emotional learning (Emmer & Evertson, 2017; Gay, 2018). Strategies now include positive behaviour reinforcement, restorative practices, and differentiated instruction to accommodate various learning styles and abilities (Tomlinson, 2014; Gregory & Fergus, 2017).

Engagement in learning, during the ancient educational period in Greece and Rome, was primarily reserved for the elite. Philosophers like Socrates emphasized active participation through dialogue and questioning, laying the foundation for intellectual engagement (Bizzell & Herzberg, 2001). In the medieval period, education was largely rote-based and religious in nature, with limited emphasis on student engagement as we understand it today (Cobban, 1975). Students were passive recipients of knowledge, with little focus on their interests or active involvement.

Also, the advent of the Industrial Revolution and early formal education in the 19th century, schooling became more widespread, but it often mirrored industrial systems, emphasizing efficiency, discipline, and standardized learning (Tyack, 1974). Engagement was largely compliance-based, focusing on memorization and strict classroom discipline, with little regard for curiosity or intrinsic motivation (Cuban, 1990).

In the late 19th to early 20th centuries, reformers like John Dewey introduced the idea of ‘learning by doing,’ promoting experiential, hands-on activities to actively engage students (Dewey, 1938). Dewey emphasized making learning relevant to students’ lives and fostering collaboration, curiosity, and critical thinking marking a shift toward viewing engagement as essential for meaningful learning (Freiberg & Driscoll, 2005).

During the mid-20th century, behaviorists like B.F. Skinner proposed reinforcement theories, using rewards and punishments to shape behavior and encourage student participation (Skinner, 1953). Concurrently, humanistic psychologists such as Carl Rogers and Abraham Maslow emphasized the emotional and psychological needs of students, asserting that students must feel safe and valued in order to fully engage in learning (Maslow, 1943; Rogers, 1969).

Constructivist theorists like Jean Piaget and Lev Vygotsky argued that engagement occurs when students actively construct knowledge through meaningful interactions and social collaboration (Piaget, 1950; Vygotsky, 1978). These ideas led to participatory, student-centered learning approaches.

In the late 20th century, educational strategies further evolved to focus on students’ interests, needs, and learning styles. The concept of student agency became central to engagement (Reeve, 2012). Paulo Freire, for instance, highlighted the role of sociopolitical context in education, advocating for critical pedagogy that actively engaged students in questioning and transforming their realities (Freire, 1970).

However, during the Standardized Testing Era of the 1980s and 1990s, engagement often declined due to an overemphasis on test preparation, which many critics argued stifled creativity and intrinsic motivation (Au, 2007; Kohn, 2000). In the 21st century, the rise of digital tools transformed engagement through interactive, multimedia resources that cater to various learning preferences (Means et al., 2009). Modern educational approaches such as project-based learning emphasize collaboration, real-world problem-solving, and student ownership of learning (Thomas, 2000).

Additionally, the growing emphasis on Social-Emotional Learning (SEL) has led educators to recognize the influence of emotional well-being on engagement (Zins et al., 2004). As classrooms become increasingly diverse, culturally responsive teaching strategies that validate students’ identities and experiences have become critical to fostering meaningful engagement (Gay, 2018; Ladson-Billings, 1995).

Lastly, engagement is understood as a multi-dimensional construct encompassing behavioral, emotional, and cognitive dimensions. Behavioral engagement involves participation in academic and extracurricular activities; emotional engagement looks at positive relationships and interest in learning; and cognitive engagement entails investment in learning and a willingness to put in effort (Fredricks, Blumenfeld, & Paris, 2004). Therefore, educators aim to create inclusive, supportive, and stimulating environments that foster all three dimensions of engagement.

Furthermore, In-service training has historically been a cornerstone of professional development for teachers, designed to enhance their skills, knowledge, and instructional practices while they are actively engaged in the teaching profession. The concept emerged more formally in the mid-20th century, when education systems began to shift from seeing teacher preparation as a one-time, pre-service event to recognizing the importance of continuous professional growth (Day, 1999).

Early in-service programs were often workshop-based and focused on technical skills and curriculum updates. However, by the 1970s and 1980s, educational reforms worldwide emphasized the importance of equipping teachers with classroom management competencies and adaptive teaching strategies to respond to changing classroom dynamics and diverse student populations (Joyce & Showers, 1980; Fullan, 2015). These shifts acknowledged that teacher effectiveness is not static and must evolve with new pedagogical approaches, societal expectations, and learner needs.

In the 1990s and early 2000s, the role of in-service training in improving classroom practices gained further prominence. Researchers began to establish links between professional development and improved student outcomes, particularly where training targeted teachers’ instructional methods, classroom management, and student engagement techniques (Guskey, 2002). This period also saw a rise in the integration of reflective practice, mentoring, and collaborative learning in in-service models (Villegas-Reimers, 2003).

Today, in-service training is increasingly viewed not just as a tool for updating knowledge but as a mechanism for transforming classroom culture. Effective training equips teachers with modern classroom management skills such as differentiated instruction, formative assessment, behavioral reinforcement, and socio-emotional learning—all of which are essential for sustaining student engagement (Opfer & Pedder, 2011; Darling-Hammond et al., 2017). In challenging contexts, such as post-conflict or resource-limited settings, in-service training plays a moderating role by preparing teachers to manage overcrowded classes, trauma-affected learners, and limited instructional materials, thereby improving classroom stability and student engagement (UNESCO, 2015).

Thus, the evolution of in-service training reflects its growing importance in moderating the relationship between classroom management and learning engagement, by supporting teachers to adapt to evolving educational demands

In Cameroon, education is a critical pillar for national development, and classroom management is central to the effective delivery of the curriculum and student success. However, across many regions of the country, including urban and semi-urban areas, schools face substantial challenges in maintaining order, motivation, and engagement within the classroom. These challenges are exacerbated by factors such as large class sizes, limited infrastructure, shortage of instructional materials, and inconsistent teacher training, all of which hinder the ability of teachers to manage classrooms effectively (Moluayonge & Park, 2017).

The concept of student engagement which encompasses behavioral, emotional, and cognitive participation in learning is gaining increased attention in Cameroon’s education sector as a determinant of academic achievement and long-term success. Yet, in many secondary schools, students’ disengagement manifests in low motivation, absenteeism, inattentiveness, and declining academic performance (Tambo, 2014). These issues are often linked to poor classroom management practices, such as over reliance on authoritarian teaching, lack of interactive methods, limited reinforcement techniques, and minimal student-centered approaches.

Compounding these challenges is the limited exposure of teachers to continuous professional development. In-service training programs, which are designed to equip teachers with up-to-date pedagogical skills and management strategies, are not uniformly implemented across the country. Many teachers in public schools, especially in underserved or conflict-affected regions, go for long periods without participating in formal training workshops or refresher courses (Folefac & Ani, 2022). As a result, classroom practices remain outdated and ill-suited to the evolving needs of learners.

In conflict affected areas such as the Southwest Region—where Kumba 1 Municipality is located the situation is even more complex. The ongoing Anglophone crisis has disrupted educational activities and created psychological distress among both students and teachers. Many schools in Kumba 1 accommodate internally displaced students, leading to overcrowded classrooms and further straining teachers’ capacity to maintain an effective learning environment. Within this context, the role of in-service training as a moderating factor becomes even more significant, as it can potentially empower teachers with strategies to foster inclusive, resilient, and engaging classrooms.

Therefore, within the Cameroonian context, especially in regions experiencing sociopolitical unrest, it is essential to explore how classroom management influences student engagement and to what extent in-service training can enhance this relationship. Understanding these dynamics is vital for improving teaching quality and learner outcomes across the country.

### Statement of the problem

The quality of education is a critical factor in shaping the future of individuals and societies (UNESCO, 2015). Central to this process is the classroom, where daily interactions between teachers and students form the foundation of learning. However, the classroom environment is complex and influenced by multiple interrelated factors that include teaching methods such as exploratory teaching method, communication styles, reinforcement practices, and the overall classroom environment (Marzano & Marzano, 2003; Evertson & Weinstein, 2006; Samaddar & Sikdar, 2023).

In many educational settings, teachers may not fully recognize the impact of their classroom management on students’ participation, motivation, and emotional involvement in the learning process (Stronge, 2018). Through observation of some selected secondary schools in kumba 1 municipality, with the ongoing anglophone crisis that has affected many parts of the country particularly Kumba in the South West region, has created a fragile and unpredictable educational environment that has led to school closures, displacement of families, psychological stress among learners, and overcrowded classrooms due to an influx of internally displaced students (Human Rights Watch, 2021). Many schools lack adequate infrastructure and teaching resources, and the prevailing insecurity has disrupted regular academic activities.

In such contexts, classroom management becomes increasingly difficult, and students' engagement in learning is often compromised. Thus, in Kumba 1, the intersection of weak classroom management and the socio-political crisis presents a pressing concern regarding students’ ability to remain meaningfully engaged in their learning process.

### General objectives

The purpose of this study seeks to find out the influence of classroom management on students’ engagement in learning among selected secondary schools in kumba 1 municipality and the moderating role of in-service training.

### Specific Objectives

1. To find out the influence of exploratory teaching methods on students’ engagement in learning.
2. To investigate how communication influences students’ engagement in learning.
3. To determine the effect of reinforcement on students’ engagement in learning.
4. To explore the influence of classroom environment on students’ engagement in learning.
5. To examine the moderating role of in-service training in the relationship between classroom management and students’ engagement in learning.

### General Research Hypothesis

Ha: There is a significant relationship between classroom management and students’ engagement in learning.

### Specific Research Hypothesis

Ha1: There is a significant influence of exploratory teaching methods and students’ engagement in learning.

Ha2: Communication has a significant influence on students’ engagement in learning.

Ha3: There is a significant influence between reinforcement and students’ engagement in learning.

Ha4: Classroom environment has a significant influence on students’ engagement in learning.

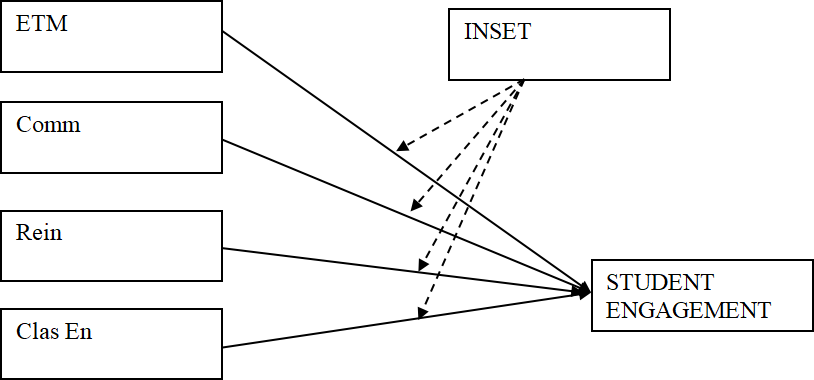
Ha5: In-service training moderate the influence between classroom management and students’ engagement in learning.

Ho5: In-service training does not moderate the influence between classroom management and students’ engagement in learning.

**Research Methodology**

### Research Design

The quantitative approach was used, specifically a cross-sectional survey design with correlational analysis to examine the causal relationships between variables and regression analysis to explain the nature of the relationship between classroom management on students’' engagement and moderating role of in-service training. Below, is the research model of this study.



**Figure 1: Research model**

### Population of the Study

The overall population of the study was made up of all secondary schools in Kumba 1 Municipality. The researcher targeted two government, one private and one mission secondary schools in Kumba 1 Municipality. The respondents targeted were students in form five, lower sixth, upper sixth and teachers in all the four targeted schools. Students of age 13years old and above while teachers <25years and above. These classes were chosen because they would easily understand the questions and respond accordingly. The accessible population for this study comprised both students from form five, lower sixth, upper sixth and teachers of any field of study in the four selected secondary schools in Kumba 1 municipality. The schools were; Government Bilingual High School Kimba- town, Victory Comprehensive College Bonge road, Government High School Kumba-mbeng and Saint John College Kumba-mbeng. These schools were all easily accessible and transportation was affordable.

### Sampling procedures

The simple random sampling technique was used to get the secondary schools while the purposive sampling technique was used to choose the classes that were involved in the study. That is the researcher decided that only the form five, lower sixth and upper sixth students were allowed to participate in the study. This is because the researcher considers them as mature and would easily understand the questions and respond accordingly. Also, the simple random sampling technique was used to select the participants in each class. All the form five and high school students had equal chance to participate in the study. First those who were willing to partake were now the focus and with this, the researcher used scramble papers enough for everyone available to pick one. Some papers read “participant” and others read “non-participant”. All students’ who picked non- participant did not participate in the study, while those who picked participant were those who participated in the study. This is because the population was too much, so a portion of the students had to represent the whole class.

Meanwhile, on the part for teachers, they were randomly selected based on those available at the time of data collection. The researcher met the teachers and explained the questionnaire to them and those who were willing and free to respond did while those who were not willing or occupied did not respond to it.

### Sampling Size

The sample was made up of 132 participants of form five, lower sixth and upper sixth students’ and 20 teachers from all the selected secondary schools in the Kumba 1 Municipality. The tables1 illustrates students’ and teachers sampled population from the four selected schools.

**Table 1: Sampled population for both students’ and teachers**

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | **Schools** | **Students’ population** | **Teachers’ population** |
| 1  2  3  4 | V.C.C Bonge Road  GBHS Kumba-Town  GHS Kumba-mbeng  St John College Kumba-mbeng  **Total** | 33  33  33  33  132 | 5  5  5  5  20 |

**Table 2: Profile of Respondents for students’**

|  |  |  |  |
| --- | --- | --- | --- |
| **Construct** | **Sub- category** | **Frequency** | **%** |
| Gender  Age  Class Level  School type | Male  Female  13-17  18-22  23 above  Form 5  Lowersixth  Upersixth  Public  Private  Mission | 36  96  73  57  2  56  34  42  60  45  27 | 27.3  72.7  55.3  43.2  1.5  42.4  25.8  31.8  45.5  34.1  20.4 |

**Table 3: Profile of respondents for teachers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Construct** | **Sub- construct** | **Frequency** | **%** |
| Gender  Age  Years of service  Educational level  School type | Male  Female  <25  25-35  35 above  <5  5-10  Above 10  A-level  BSc  MSc  Others  Public  Private  Mission | 11  9  2  4  14  4  7  9  1  10  5  4  10  5  5 | 55  45  10  20  70  20  35  45  5  50  25  20  50  25  25 |

### 

### Instrument

The instruments used for this study were questionnaires addressing classroom management and teachers’ in-service training. The questionnaire on classroom management was adapted from established instruments developed by Joyce et al. (2015), Wiggins and McTighe (2005), and Keller (1987). This tool assessed five constructs: Exploratory Teaching Method (ETM), Communication, Reinforcement, Classroom Environment (CRE), and Students’ engagement in learning and questionnaire on teachers’ In-service training was adapted from Barry et al. (1998). It was designed to examine the moderating role of professional development on classroom management. These questionnaires were divided into two main parts.

Part One captured demographic information including age, gender, type of school, class taught., years of teaching experience, educational qualification, subject taught, type of school, and current position

Part two of classroom management questionnaire was further divided into two sections:

Section A focused on the independent variable (classroom management) and consisted of four sub-sections reflecting the research objectives: exploratory teaching method, communication, reinforcement, and classroom environment. Each sub-section contained ten items, totaling 40 items.

Section B addressed the dependent variable students' engagement in learning with 10 items. In total, the classroom management questionnaire comprised 50 items and that of in-service training had five items, all measured on a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

### Data analysis

Prior to the data analysis, the validity and reliability of the construct items were tested. Cronbach alpha was used to test the reliability of the measures. All Cronbach alpha values were above 0.7 though reinforcement and classroom environment had values below 0.7 which stll indicates good reliability as the constructs measured what it is supposed to measure consistently with insignificant difference in the results (Creswell, 2014). This can be seen in table (4) below. The prior analysis further reported that there was no common method bias in the research tools used, since the common method variance [CMV] was 21.873 which is less than 50% (Podsakoff et al., 2003; Podsakoff et al., 2012). Therefore, the data for this study was suitable for analysis as observed in table 4. Also, The descriptive and correlation were performed using SPSS (Hayes, 2013) while Multiple linear regression analysis using ordinary least squares path analysis was performed using model one (Hayes, 2013) of macro in SPSS was done to examine the effect of the independent variable on the dependent variable.

Lastly, in order to verify the moderating effect of in-service training by teachers in the relation between classroom management and students’ engagement in learning, bootstrap analysis based on 5,000 corrected bootstrap samples was performed at 95% confidence level and test of highest order unconditional interaction was performed, plus the moderation effect. Bootstrapping was performed at 95% confidence level based on 5000 corrected bootstrap samples to verify the direct effect and moderating role.

**Table 4: KMO`s, composite reliability, reliability and CMV values for main constructs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **KMO** | **Composite reliability (CR)** | **Reliability (α)** | **Common Method Variance (CMV)** |
| **CM** | 0.782 | 0.939 |  | **21.873%** |
| **ETM** | 0.787 | 0.819 | 0.874 |
| **COM** | 0.773 | 0.760 | 0.765 |
| **REIN**  **CRE**  **SEL**  **INSer** | 0.650  0.834  0.855  **0.722** | 0.737  0.844  0.878  0.988 | 0.687  0.599  0.822  **0.984** |

Source: author. CM: Classroom Management; ETM: Exploratory Teaching Method; COM: Communication; REIN: Reinforcement; CRE: Classroom Environment; SEL: Students’ engagement in learning; INSer: In-service training.

### Result:

Prior to testing the objectives of the study, descriptive statistics and correlation was done to get an insight into the data.

Descriptive Statistics

**Table 5: Descriptive statistics for main and sub constructs**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | N | Mean | Standard  Deviation | Skewness | | Kurtosis | |
| Statistic | Standard Error | Statistic | Standard Error |
| Classroom management | 132 | **2.922** | 0.422 | -1.058 | 0.211 | 1.540 | 0.419 |
| Exploratory teaching method | 132 | 3.074 | 0.515 | -1.211 | 0.211 | 1.1998 | 0.419 |
| Communication | 132 | 2.892 | 0.511 | -0.729 | 0.211 | 1.020 | 0.419 |
| Reinforcement | 132 | 2.604 | 0.488 | -0.015 | 0.211 | 0.260 | 0.419 |
| Classroom environment | 132 | 3.059 | 0.585 | -0.090 | 0.211 | 1.255 | 0.419 |
| Students’ engagement in learning | 132 | 3.133 | 0.633 | -0.909 | 0.211 | 0.697 | 0.419 |
| In-service training | 20 | 1.392 | 0.227 | 1.188 | 0.211 | 0.730 | 0.419 |

Source: field work

From table 5, descriptive statistics revealed that all the absolute values of Skewness were less than 3 while those of kurtosis were less than 7 (George & Mallery, 2010; Byrne, 2013) implying that the data points were normally distributed and thus the data support the rule of standard normal Distribution.

From table 5 above, descriptive statistics revealed that classroom management (M = 2.922, SD = 0.422), exploratory teaching method (M = 3.074, SD = 0.515), communication (M = 2.892, SD = 0.511), reinforcement (M = 2.604, SD = 0.488), classroom environment (M = 3.059, SD = 0.585), and students’' engagement in learning (M = 3.133, SD = 0.633) all recorded mean scores between 2.51 and 3.25, indicating high levels. In contrast, in-service training had a mean score of 1.392 (SD = 0.227), falling within the 1.00 to 1.75 range, which signifies a low level in-service training.

In a nutshell, the results revealed a moderate level of classroom engagement while highlighting a notable gap in teachers’ participation in in-service training in the selected secondary schools in kumba 1 municipality.

### Correlation of the main variables

Pearson correlation coefficients among the main and sub-variables of the study were performed. Pearson’s values range from -1 to +1, where values closer to +1 indicate a strong positive relationship, values near -1 indicate a strong negative relationship, and values around 0 indicate no linear relationship. Statistical significance was considered at p < 0.5 levels.

SEL

CM

\*

INSer

INSer

CM

**Table 6:** Correlation analysis of main study variables: classroom management (CM), student engagement in learning (SEL), and in-service training (INSer)

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | 1(CM) | 2(SEL) | 3(INSer) |
| 1. Classroom Management (CM) | 1 |  |  |
| 2. Student engagement in learning (SEL) | 0.641\*\*\* | 1 |  |
| 3. In-service training (INSer) | 0.038 | 0.137 | 1 |

\*\*\*p<0.001. P>0.05

As gleaned in table 6, results indicate a strong positive correlation between classroom management and student engagement in learning (r = 0.641, p < 0.001). Furthermore, the correlation between classroom management and in-service training is positive but not statistically significant at (r = 0.038, p >0.05). Similarly, the relation between student engagement in learning and in-service training at 95% confidence level was not significant (r = 0.137, p >0.05).

In summary, the findings from the correlation analysis highlight that among the variables examined, classroom management had a very strong correlation with students’ engagement in learning.

### Correlation (r) of sub-Variables

**Table 7: Correlation of main and sub variables of the study.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **1** | **2** | **3** | **4** | **5** | **6** |
| ETM | 1 |  |  |  |  |  |
| COM | 0.601\*\*\* | 1 |  |  |  |  |
| REIN | 0.335\*\*\* | 0.486\*\*\* | 1 |  |  |  |
| CRE | 0.607\*\*\* | 0.637\*\*\* | 0.435\*\*\* | 1 |  |  |
| SEL | 0.548\*\*\* | 0.546\*\*\* | 0.290\*\* | 0.643\*\*\* | 1 |  |
| INSer | 0.112 | 0.010 | -0.053 | 0.0.47 |  | 1 |

\*\*\*p<0.001; ETM: Exploratory teaching method; COM: Communication; REIN: Reinforcement; CRE: Classroom Environment; SEL: Students’ Engagement in learning; INSer: in-service training.

From Table 7, several significant statistically significant relationships were observed among t variables:

Exploratory Teaching Method (ETM) showed statistically significant relationships with Communication (COM) (r = 0.601, p < .001), reinforcement (REIN) (r = 0.335, p < 0.001), classroom environment (CRE) (r = 0.607, p < 0.001), and students’ engagement in Learning (SEL) (r = 0.546, p < 0.001) and no significant positive correlation with in-service training (INSer) (r=0.112, P >0.05). In summary, the findings revealed that the Exploratory Teaching Method (ETM) strongly supports key aspects of classroom management, particularly communication and the classroom environment.

**Result according to main objective: To investigate how classroom management influence students’ engagement in learning.**

In order to investigate how classroom management influence students’ engagement in learning, linear regression analysis was performed as seen from table 8.

Regression analysis

**Table 8: Results according to main objective**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | |  |
| Model  Summary | **R** | **R-square** | **AdjR2** | **SE** | **F** | **df1** | **df2** | P-value |
| 0.641 | 0. 411 | 0. 407 | 0488 | 90.951 | 1 | 1 30 | 0.000 |
|  | | | | | | | |  |
| **Variable** | **B** | **SE** | **Β** | **T** | **P-value** | | | |
| Constant | 0.324 | 0.298 | - | 1.089 | 0.278  0.000 | | | |
| CM | 0.242 | 0.025 | 0.641 | 9.532 |

Linear regression analysis revealed that classroom management has a significant positive influence on student engagement in learning. This effect was significant at 99% confidence level (**β** =0.641, P<0.001). Classroom management explain 41.1% of the variance in student engagement in learning. An increase in the level of classroom management by one point will cause 0.641 increase in the level of student engagement in learning.

Normal probability plot of the regression standardized residuals shows a linear relationship with a standard normal distribution as demonstrated in figure 2.

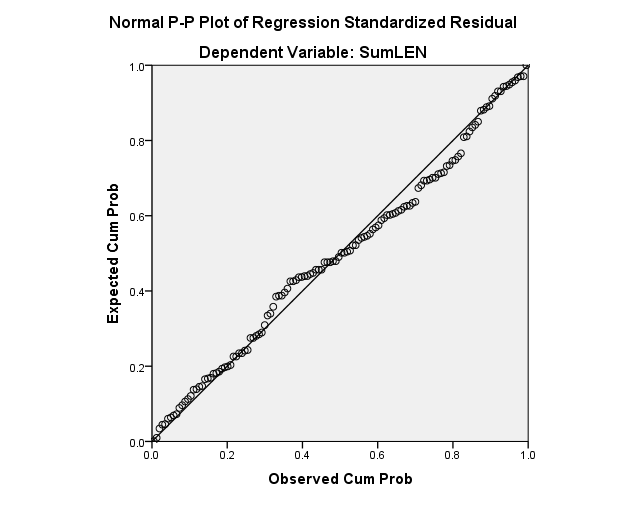


Figure 2: Normal probability plot of the regression standardized residuals.

## 

**Results according to specific objectives**

In this section, multiple linear regression was performed to investigate specific objectives 1, 2, 3 & 4. The results are presented in table 9.

**Table 9: Regression analysis results**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | |
| Model  Summary | **R** | **R-square** | **MSE** | **F** | **Df1** | **Df2** | **p-value** |
| 0.684 | 0.468 | 0.468 | **27.890** | **4** | 127 | 0.000 |
|  | | | | | | | |
| **Variable** | **B** | **SE** | **Β** | **T** | **P-Value** | | |
| Constant | 0.494 | 0.294 | - | 1.681 | 0.095  **0.026**  0.061  0.507  **0.000** | | |
| ETM | 0.241 | 0.107 | 0.196 | 2.255 |
| COM | 0.219 | 0.116 | 0.177 | 1.891 |
| REIN | -0.065 | 0.098 | -0.050 | -0.661 |
| CRE | 0.468 | 0.099 | 0.433 | 4.724 |

The table 9 shows results of multiple linear regression. The results obtained are interpreted in order of the research objectives.

**Result according to specific objective 1**: To find out the influence of exploratory teaching methods on students’ engagement in learning.

In order to investigate research objective 1,which was to find out the influence of exploratory teaching methods on students’ engagement in learning, linear regression analysis was performed.

As gleaned from table 9, multiple linear regression analysis results revealed that at 95% confidence level, Exploratory teaching method used by teachers had a significant positive influence on student engagement in learning (β=0.196, P<0.05). This implies increase in levels of exploratory teaching method by one point causes a positive change by 0.196 units in the level of students’ engagement in learning.

### Result according to specific objective 2: To investigate how communication influences students’ engagement in learning.

Multiple linear regression analysis reviewed that at 95% confidence level, the extent of communication by teachers did not have a significant effect on student engagement in learning (β=0.177, p>0.05). This indicates that the current data for this study did not provide evidence that communication influences student engagement in learning.

### Result according to specific objective 3: To determine the effect of reinforcement on students’’ engagement in learning.

As shown in table 9, multiple linear regression analysis result revealed that the extent of reinforcement method of teaching did not significantly influence students’ engagement in learning at 95% confidence level (β= - 0.050, p > 0.05).

### Result according to specific objective 4: To explore the influence of classroom environment on students’ engagement in learning.

As can be seen from table 9, multiple linear regression analysis result revealed that at 99% confidence level, the current data provided evidence that extent of management of classroom environment in teaching had a significant positive influence of student engagement in learning. Multiple linear regression analysis further revealed that if the extent to which teachers manage the classroom environment increases by one point, a positive change of 0.433 points increase is observed in the perception level of student engagement in learning (β=0.433, P<0.001).

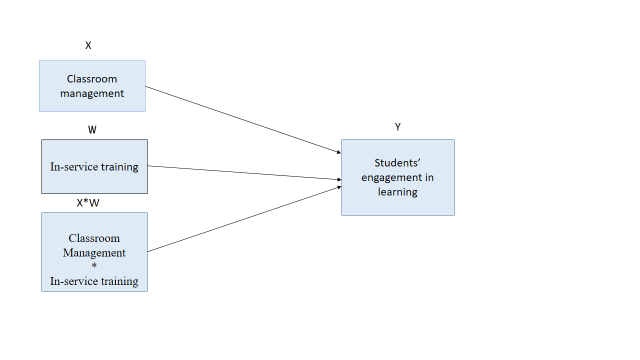
### Result of specific objective 5: To examine the moderating role of in-service training in the relationship between classroom management and students’ engagement in learning.

In order to investigate the moderating role of in-service training in the relationship between classroom management and student engagement in learning, Moderation analysis (Hayes, 2013), using ordinary least squares path analysis was performed.

Moderation Analysis

**Table 10: Path analysis on the moderating effect of in-service training**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Outcome variable Students’ engagement in learning (SEL)** | | | | | | | |
| Model summary | **R** | **R-square** | **MSE** | **F** | **Df1** | **Df2** | **P-value** |
|  |  |  |  |  |  |  |
| Model | **B** | **SE** | **T** | **P-value** | **LLCI** | **ULCI** |  |
| Constant | 0.141 | 0.041 | 77.435 | 0.000 | 3.061 | 3.221 |  |
| Classroom management | 0.944 | 0.097 | 9.748 | 0.000 | 0.753 | 1.136 |  |
| **INSer** | 0.402 | 0.184 | 2.190 | 0.030 | 0.039 | 0.766 |  |
| Int\_1 (x.w) | -1.498 | 0.477 | -3.143 | 0.002 | -2.442 | -0.555 |  |
| **Test of highest order unconditional interaction** | | | | | | | |
|  | R2-change | F-value | Df1 | Df2 | p-value |  |  |
| **CM\*INser** | 0.041 | **9.880** | 1 | 128 | 0.002 |  |  |

**Source Fieldwork 2025**

**Figure 3: Statistical diagram of objective five**

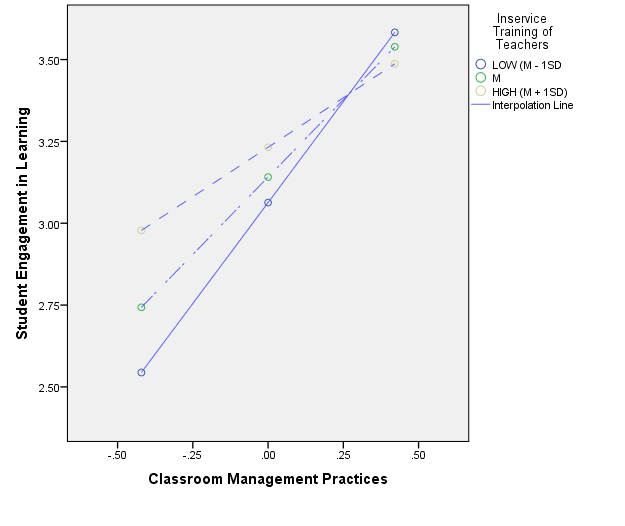
In order to investigate whether teacher in-service training moderate the relation between classroom management and student engagement in learning, moderation analysis using ordinary least squares path analysis was performed. Using model 1(Hayes 2013) of Process Macro in SPSS the moderation analysis was performed and results presented in table 10.

Either viewed from table 10 or from figure 3, moderation analysis revealed that in-service training of teachers is a significant moderator in the relationship between teachers’ classroom management and students’ engagement in learning as the interaction effect between classroom management and in-service training revealed (CS\*INSer: B= -1.498, P<0.01).

### Verification of the moderating effect

As seen on table 10, based on 5,000 corrected bootstrap samples the interaction effect (-1.498) was significant as bootstrap confidence interval was entirely below zero (-2.442 2 - 0.555). Therefore, it is evident that in-service training of teachers moderated the relationship between classroom management and student engagement in learning. In other words, in-service training of teachers is a good intervention in the relation between classroom management and student engagement in learning.

Furthermore, the researcher also verified at which values of the moderator was the moderating effect significant as gleaned below.



**Figure 4: Visual representation of the moderating effect of in-service training**

Again, the moderating effect of in-service training was visualized as shown in figure 4. As visualized, at low values (M – 1SD) of the moderator in-service training and at low values of the focal antecedent classroom management, the level of student’s engagement in learning is 2.55. Then as the value of the moderator in-service training changes to average (M), and at average values of the focal antecedent classroom management, the level of students’ engagement in learning increases to 2.70. Then, lastly, as the level of the moderator in-service training increases to high (M + 1SD), and at high level (M + 1SD) of classroom management, the level of students’’ engagement in learning increases further to 2.95. These finding suggest that as perceived by the respondents of the current study, low levels of students’ engagement in learning were associated to low levels of classroom management as a result of low levels of in-service training, and also the higher levels of students’ engagement in learning were associated to higher levels of classroom management and higher levels of in-service training.

### Discussions

With respect to objective one, which investigated how exploratory teaching method affects students’ engagement in learning, the current findings reported that exploratory teaching method had a significant positive influence on student engagement. This indicates that exploratory teaching method or student-centered methods such as group discussions, problem-solving, inquiry-based tasks, and learner-centered projects used by teachers, increased learners’ engagement as reported by participants in the study. The significant effect of exploratory teaching method aligns with the work of Prince and Felder (2006), who noted that active, student-driven teaching strategies such as inquiry-based learning and problem-solving significantly enhance student engagement and motivation. Also, the positive effect of exploratory teaching method is consistent with Vygotsky’s (1978) social constructivist theory, which emphasizes learning through interaction and exploration. This suggests that teachers among these selected secondary schools in kumba 1, should move away from traditional, teacher-centered instruction toward more active and participatory pedagogies such as incorporating project-based learning to encourage students to explore content independently or in groups, encourage lesson planning that includes real-life problem-solving and inquiry-based learning activities.

Also, communication as reported by participants**,** had no significant effect on students’ engagement in learning. This implies that teachers’ communication skills, as perceived by the students, did not notably contribute to enhancing their learning engagement. Although communication is generally recognized as a vital aspect of teaching, in this study, it was not a determining factor influencing how engaged students felt in their academic activities. This could suggest that students may prioritize other classroom dynamics such as how lessons are structured, the level of interaction, or the classroom environment over communication style alone. This result is consistent with the study by Pianta et all. (2012), who found that while teacher communication plays a role in classroom interactions, its direct impact on student engagement can be minimal when not reinforced by other elements such as emotional support and instructional quality. Similarly, Wang and Holcombe (2010) concluded that students tend to respond more positively to teaching approaches that promote autonomy and task relevance, which have a more substantial impact on engagement than communication alone. This implies that communication skills alone may not be sufficient to boost student engagement. Therefore, school administrators and teacher training programs should consider a more holistic approach that emphasizes interactive teaching methods, classroom climate, and student-centered learning strategies and teachers should be encouraged to combine effective communication with practices that foster autonomy, relevance, and emotional connection, to meaningfully enhance student engagement in learning.

The findings indicated that reinforcement exhibited a non-significant and slightly negative relationship with students’ engagement in learning. This suggests that the use of reinforcement strategies by teachers, as currently practiced in the classroom, does not play a significant role in promoting student engagement. The slightly negative trend of the result may imply that certain reinforcement techniques might even be perceived by students as ineffective or possibly demotivating, especially if they are inconsistent or not aligned with students’ individual needs and expectations. This result corroborates with the findings of Deci, Koestner, and Ryan (2001), who argue that extrinsic rewards when overused or not thoughtfully applied can undermine intrinsic motivation, which is a key driver of engagement. They found that reinforcement in the form of external rewards may shift students’ focus from the value of learning to the pursuit of rewards, which can reduce genuine interest and participation. Similarly, Reeve (2006) emphasized that controlling reinforcement methods for example using praise or rewards to manipulate behavior can hinder students’ autonomy and engagement in that, when reinforcement is used in a controlling way such as offering praises only when students behave exactly as expected, in can send a message that students are not trusted to take initiative or make their own learning choices. These perspectives reinforce the idea that the way reinforcement is applied matters greatly. When used ineffectively, it may not produce the intended positive effects on learning engagement. This suggests that teachers may need to re-evaluate how reinforcement strategies are implemented in the classroom.

Also, instead of relying heavily on extrinsic rewards, educators should consider adopting more autonomy-supportive practices that encourages intrinsic motivation such as providing meaningful feedback, acknowledging student effort, and creating a sense of purpose in learning tasks.

Additionally, classroom environment emerged as the most significant predictor of students’ engagement in learning, confirming that a supportive, well-structured, and inclusive learning environment significantly boosts students’ engagement in learning activities. The importance of classroom environment is supported by Fraser (2012), who found that classroom environments characterized by mutual respect, inclusivity, and emotional support are critical for promoting engagement. Roorda et al. (2011) also noted that the quality of the classroom climate and teacher-student relationships significantly influence emotional and behavioral engagement. Also, this is consistent with studies by Weinstein (2006) and Marzano (2003), who emphasize that a safe, organized, and stimulating learning environment directly fosters active engagement and academic success. This finding emphasizes that teachers should prioritize classroom management strategies that promote a culture of respect, collaboration, and inclusion. Also, design classroom layouts and routines that minimize distractions and foster positive interactions and provide psychological support services or peer mentoring programs to address emotional and behavioral needs within the classroom context.

Lastly, the result revealed that in-service training had a significant moderating effect on the relationship between classroom management and students’ engagement in learning. This means that the extent to which classroom management influences students’ engagement depends on whether or not teachers have received in-service training. Specifically, teachers who had undergone relevant and up-to-date in-service training were more effective in using classroom management strategies to promote student engagement. The finding is consistent with Guskey (2002), who emphasized that professional development enhances teachers’ instructional practices, thereby improving student outcomes, including engagement. Similarly, Ono and Ferreira (2010) found that ongoing in-service training empowers teachers with innovative methods of classroom control and student motivation, which are critical to fostering active learning. These studies confirm that the presence of in-service training strengthens the effectiveness of teaching practices, including classroom management, by equipping teachers with skills aligned with current educational demands and learner needs. This implies that professional development should not be seen as optional, but rather as a necessary component of effective teaching. Educational stakeholders should prioritize regular and targeted in-service training programs that focus on practical classroom management and learner engagement strategies. This will ensure that teachers are better equipped to translate their management skills into meaningful student engagement. Without such training, even well-intentioned classroom management efforts may fall short of their potential to actively involve students in the learning process.

### Conclusion

This study investigated the influence of classroom management on students’ engagement in learning among selected secondary schools in Kumba I municipality and the moderating role of in-service training. Based on the results from specific objectives of multiple linear regression analysis, it was concluded that exploratory teaching methods and classroom environment have significant positive influences on students’ engagement in learning. Thus, these findings emphasize the importance of learner-centered pedagogy and conducive classroom settings in promoting active learning. Conversely, reinforcement and communication did not show statistically significant effects, although communication showed a near-significant positive trend. The findings further suggest that effective classroom management can substantially improve student engagement, particularly when mediated through continuous in-service training. Thus, comprehensive classroom management remain crucial for enhancing student engagement in learning.

### Recommendations

Based on the findings and conclusions, the following recommendations were made:

Firstly, policymakers and educational stakeholders, should develop and enforce policies that promote continuous professional development through in-service training that align with modern classroom management strategies. Also, allocate resources to improve classroom infrastructure and create environments that support student engagement for example proper lighting, seating arrangement, and learning aids.

Also, schools’ administrators must carefully design in-service programs to complement and not replace effective classroom management and evaluation mechanisms should be in place to assess how training affects both teaching behaviors and student engagement over time. Again, this in-service training should be provided regularly focused on effective classroom management practices, including the use of exploratory methods and environmental structuring, encourage peer observation and collaborative learning among teachers to improve communication techniques and classroom interaction skills.

Furthermore, teachers should accept professional growth that would help them improve on their classroom management in fostering student engagement, adopt and consistently implement exploratory teaching methods that actively involve students in the learning process, such as group discussions, problem-solving, and project-based learning. Equally, teachers should create and maintain positive classroom environments that support collaboration, respect, and psychological safety for all.

Additionally, to future researchers, further studies should explore whether the content, quality, or delivery mode of in-service training accounts for its differential moderating effect, conduct a qualitative studies to gain deeper insights into how communication and reinforcement are applied and perceived in different classroom contexts, a before and after study could be carried out, to see the pattern of change in the finding, same study could be carried out in all secondary schools in Kumba 1 municipality so that the findings can be generalized for all secondary schools in Kumba 1 municipality.

**Disclaimer (Artificial intelligence)**

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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