Effect of In-Service Teacher Training Programs in the Use of Pedagogical Tools and Student Learning Outcomes in Social Studies in Public Primary Schools in Rwanda: A Case Study of Nyarugenge District

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Abstract: The proposed study examines how in-service teacher training programs affect student learning outcomes in social studies within public primary schools in Rwanda's Nyarugenge District. It focuses on three key aspects: the influence of teacher certification on student academic performance, the effect of changes in teaching methodologies on student motivation, and the impact of curriculum mastery on student participation. A descriptive survey design combining quantitative and qualitative methods was adopted. From a total population of 1,568, a sample of 326 participants was selected using the Yamane formula, including 316 teachers chosen by simple random sampling and 10 head teachers selected purposively.Data were collected using questionnaires and interview guides. Analysis involved descriptive statistics (frequencies, percentages, means, and standard deviations) and inferential statistics, particularly multiple regression, using SPSS version 21. Findings reveal a strong positive correlation between in-service teacher training and student learning outcomes, with 71.7% of performance variance explained by training programs. Among the training components, curriculum mastery showed the strongest correlation (0.719), highlighting its critical role in enhancing student engagement and understanding. Moderate positive relationships were also found between training and teacher certification (0.646), as well as adaptability in teaching methodologies (0.534). These results indicate that trained teachers tend to be more knowledgeable, certified, and flexible in their instructional approaches, which significantly improves teaching effectiveness. The study concludes that in-service teacher training is crucial for boosting student motivation, participation, and achievement in social studies. It recommends that the Ministry of Education and other stakeholders prioritize investment in teacher development programs, emphasizing curriculum mastery, certification, and active teaching strategies. Continuous professional development should be supported as a direct means of enhancing both teaching quality and student learning outcomes in public primary schools.

Keywords: In-Service Teacher, Training Programs, Pedagogical Tools, Learning Outcomes, Public Primary Schools, Nyarugenge District.

I. INTRODUCTION

In Mexico, in-service teachers training in basic education is a priority for the educational authorities. By virtue of the National Agreement for the Education Update in-service teacher training achieved more importance; further, we cannot leave out the contribution of the Emerging Programme of Teachers Update and the Programme of Teachers Update to the 2015 creation of the National Programme for the Basic Education Teachers' Permanent Update (Ayvaz-Tuncel, & Çobanoğlu, 2018).

For the above-mentioned reasons, and others pointed out by Randall and Anderson (2016), in-service teacher training gained greater relevance. These authors describe policies targeted to teachers' training in various Latin American countries, which are aimed at identifying specific barriers that teachers face in their professionalization. They also show how the Federal Net of in-service training in Argentina was created to gather training institutions that offer in-service teachers training. In Brazil the project In-service Teachers Training aims to promote teachers' professional development. Other training initiatives are located in Colombia and in Chile. These initiatives show different teachers' networks and national and international internships for teachers (Ávalos, 2022).

Around the world, the idea of in-service teacher training is to encourage teachers' professional development. More specifically, the training has been put in place to facilitate the continuous professional growth of teaching staff members, remove discrepancies in teachers' backgrounds in education, and keep the teaching profession up to date with new knowledge., promote the carrying out of innovative ideas and make it simpler for educators to assume duties associated with the changing nature of the learning environment (Osamwonyi, 2016). According to Cömert (2018), in-service training is defined as the systematic development of attitudes, knowledge, skills, and behavior patterns that teachers require to carry out their given duties or occupations efficiently and raise their students' social studies performance.

Uganda's education system was restructured in 1987 in response to the political instability that had led to its collapse. Among other things, this involved starting up in-service teacher training again. The Education Policy Review Commission (EPRC) was appointed with the intention of assessing the educational system and making recommendation for the enhancement and restoration of policies. Important measures of Uganda's educational quality, including teacher attrition, student-teacher ratios, and cohort survival rates, have gotten worse to the point where the country's current educational system was unable to achieve its goals (Nzarirwehi, & Atuhumuze (2019). In order to strengthen the teaching workforce, in 2015, Teacher Development and Management System (TDMS) were developed in responding to the realization that the previous approach was ineffective. The implementation of TDMS has the only goal of enhancing primary education delivery equity and quality through enhanced school.

An analysis of literature found that implementing student-centered instruction effectively requires skills well beyond those of a great many educators. Rwanda has currently changed its basic and secondary school curricula, including the mandatory extra course on entrepreneurship, by emphasizing practical skills and engaging methods in recognition of the problematic nature of the country's youth labor market (Iwasaki, Sugiyama, Mutsinzi & Morita, 2015). For teachers to properly implement a new curriculum, just directing its acceptance without providing sufficient training may not be sufficient. 72% of young people in Rwanda who are working work for family-owned enterprises or are independent contractors (African Development Bank, 2017). These results highlight the possibility that students in schools are not learning the skills required to start and expand small enterprises or work in the formal sector. This study investigated the effects of in-service teacher training programs on student learning outcomes in social studies within Rwandan public primary schools in the Nyarugenge District, Rwanda. The main objective of this study was to assess the Effects of In-Service Teacher Training Programs on Students' Learning Outcomes in Social Studies in Public Primary Schools in Rwanda, A Case of Nyarugenge District.

II. RESEARCH METHODOLOGY

Research Design

Using both quantitative and qualitative methods, the study used a descriptive survey design. It is a technique for gathering data that involves interviewing or surveying a sample of people.

Target Population

According to the statistical data from the District Education Officer (2024), the target population from which the sample was drawn consists of 1499 teachers who teach 62009 students (Male: 31392, Female: 30617) in public primary schools, and 69 head teachers from 69 public primary schools in Nyarugenge District. The sample size of teachers and head teachers was drawn from the sampled schools in ten sectors of the Nyarugenge District.

Sample Design

Due to the large number of the target population, the researcher found it impossible for using the entire population due to insufficient time and means. Accordingly, the researcher selected some elements of the population who gave data for the research and the results were generalized to get a view of the current situation throughout the district. The researcher randomly and purposively selected 326 participants to form the sample.

Sample Size Determination

The study used a sample size of 316 teachers and 10 head teachers from 10 sampled public primary schools in the Nyarugenge District. The sample size of teachers and head teachers was drawn from sampled schools in ten sectors of the Nyarugenge District.

Table 1: Target Population and Proportionate Sample Size

Respondents	Population	Sample size
Teachers	1499	316
Head teachers	69	10
Total	1568	326

Source: Educational Statistical Data from District Education Officer (2024)

The research used the formula that Yamane Taro (1967), as cited by Agbionu (2016); to determine a sample.

$$n = \frac{N}{1+N(e)^2}$$

The above formula was used to determine the number of teachers who participated in the research, where e is the level of significance or margin of error (5%), n is the sample size, and N is the sample frame, at a 95% confidence level to obtain:

$$n = \frac{1499}{1+1499(0.05)^2} = 315.74 = 316$$

Sampling Techniques

For the quantitative approach, the study used simple random sampling design in selecting the schools to be included in the study. The teachers of the sample schools became respondents to the study. For the qualitative approach, the study used purposive sampling. Therefore, the head teachers of the sampled schools were interviewed to support the quantitative data.

Data Collection Methods

The researcher used different data collection instruments to collect the data for research.

Data Collection Instruments

The study collected primary data using questionnaires and interview guide. The researcher constructed close-ended questionnaire, which were administered to teachers. The researcher used questionnaire because large amount of information needs to be collected from a large portion of a group. Due to the number of respondents expected, the questionnaire is the most appropriate research instrument that were used.

For the qualitative approach, the researcher used an interview guide and a voice recorder to collect data. This tool enables the researcher to obtain more authentic information to support or negate data from the quantitative approach on in-service teacher training programs and student learning outcomes in social studies in public primary schools beyond the limited questionnaire since respondents tend to give more specific information and this tool enables the researcher to have the advantage of comparing both the questionnaire and response from the interview questions.

Administration of Data Collection Instruments

The researcher's data collection plan for the study involves a two-step process. First, they secure permits. Approval from Mount Kenya University was given, due to the researcher's affiliation, and from the Nyarugenge District Mayor as the research involves participants within that district. This two-pronged approach ensures the research adheres to ethical guidelines set by the university and gains local government support.

For data collection itself, the researcher utilized a combination of questionnaires and interviews. Questionnaires were administered directly to teachers within their schools. The researcher distributed questionnaires and oversee completion. Interviews, however, conducted solely with the head teachers. To minimize disruption to the school schedule, appointments were being made beforehand to secure the head teachers' time.

Data Analysis Procedure

In order to tabulate and statistically evaluate the data, descriptive statistics like means, frequencies, and percentages were used. Descriptive statistics are meant to help the researcher interpret the results in a meaningful way. Tables with the frequency and percentage of the data was displayed. The Statistical Package for the Social Sciences, or SPSS, version 21.0, was used for the study's data analysis. Multiple regression analysis was used to determine the effect of independent variables on the dependent variables.

III. RESEARCH FINDINGS

1. Respondents Questionnaire Return Rate

The research findings are more reliable and precise due to a high response rate, which is consistent with previous studies that highlight the significance of minimizing non-response bias and obtaining representative samples through high response rates (Groves et al., 2019). The speed at which the participants responded to and submitted the questionnaires is outlined below.

Table 1: Response Rate

		Distributed questionnaires	Returned questionnaires	Frequency (%)	Cumulative Percent
Valid	Teachers	316	316	96.9	96.9
	Head teachers	10	10	3.1	100
	Total	**326**	**326**	**100**	

Field data (2024)

The table shows a high response rate for the distributed questionnaires, with all 326 questionnaires returned, representing a full 100% response rate. Teachers accounted for the majority, with 316 responses, making up 96.9% of the total, while head teachers contributed 10 responses, or 3.1%. The cumulative percentage indicates that teachers' responses reached nearly all of the total response rate, with head teachers completing the remainder to reach a full response rate. This high response rate suggests strong engagement from both teachers and head teachers, providing a reliable and comprehensive dataset for the study.

Gender of Respondents

The researcher investigated the gender of participants to ensure that the findings are broader and reflect the diverse experiences of all individuals, free from any gender biases.
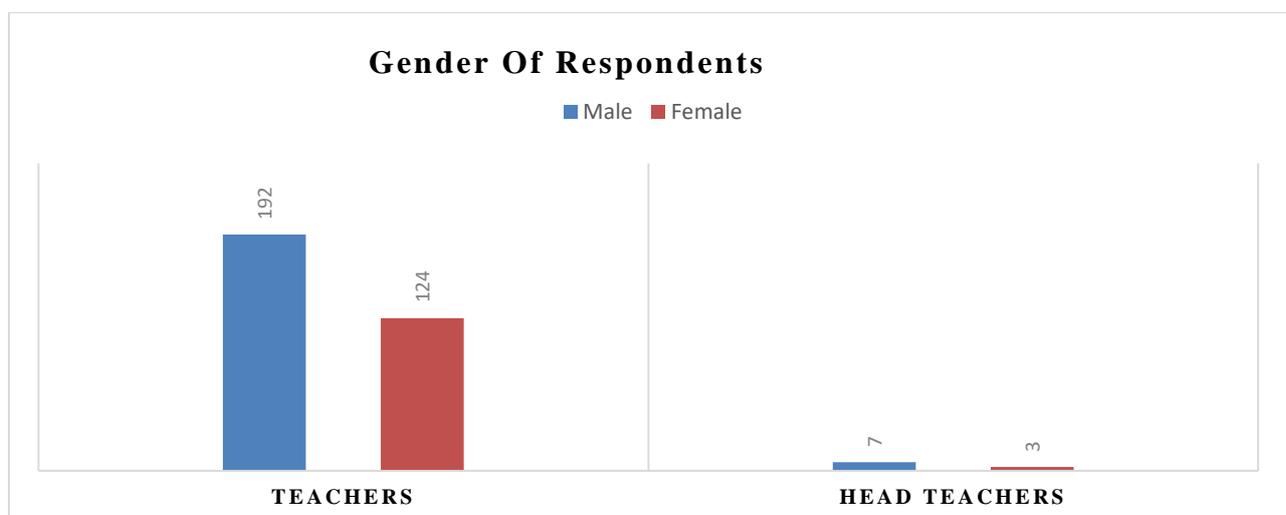

Figure 1: Gender of Respondents

The figure1 presents the gender distribution of respondents among teachers and head teachers. Among teachers, there is a notable gender disparity, with 192 males and 124 females, indicating that male teachers are more prevalent in the sample. Similarly, in the category of head teachers, males also outnumber females, with 7 male head teachers compared to only 3 females. This gender imbalance suggests that males hold a higher representation in both teaching and leadership roles within the study sample, possibly reflecting broader gender trends in the educational workforce or specific context of the research area.

2. Presentation of Findings

This segment outlines the research results and examines them within the thematic structure of the research goals. The emphasis of the research was to examine the influence of teacher certification on student academic performance in public primary schools the Nyarugenge District, Rwanda, to determine the effects of teacher's change of teaching methodologies on student's learning motivation in public primary schools the Nyarugenge District, Rwanda, to assess the influence of teacher's curriculum mastery on student's participation in learning in public primary schools the Nyarugenge District, Rwanda. Data were gathered in alignment with the specific objectives stated previously. The research results were displayed in tables, and discussions were conducted according to the study objectives.

2.1 Influence of Teacher Certification on Students' Academic Performance

The first objective of the study was to examine the influence of teacher certification on student academic performance in public primary schools in Nyarugenge district, Rwanda. To achieve this goal, the researcher developed a questionnaire for educators and also conducted an interview guide with school principals. The table offers a detailed perspective, illustrating the breakdown of responses among various categories by evaluating different statements using a scale where 1 signifies strongly disagree (SD), 2 represents disagree (D), 3 stands for neutral (N), 4 indicates agree (A), and 5 denotes strongly agree (SA). Every statement was evaluated for its frequency, percentage mean, and standard deviation, offering insights into the level of consensus or dissent among participants.

Table 2. Influence of Teacher Certification on Students' Academic Performance

Statements	SD		D		N		A		SA		Mean	St. Dev
	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
Students with certified teachers are better equipped to understand complex subject matter in social studies.	35	11.1	32	10.1	0	0.0	42	13.3	207	65.5	4.120	1.431
A teacher's certification ensures they can effectively explain concepts in a way that enhances student learning in social studies.	16	5.1	56	17.7	6	1.9	56	17.7	182	57.6	4.050	1.327
Social studies test scores are a better indicator of a teacher's effectiveness than their certification status.	8	2.5	24	7.6	3	0.9	38	12.0	243	76.9	4.531	1.015
Students learn best from teachers who are experts in social studies.	14	4.4	36	11.4	0	0.0	18	5.7	248	78.5	4.424	1.209

Field data (2024)

The table 2 provides insights into teachers' perceptions of how teacher certification impacts student academic performance in social studies in public primary schools in Nyarugenge district. The first statement, "Students with certified teachers are better equipped to understand complex subject matter in social studies," received strong agreement, with 65.5% of teachers strongly agreeing and 13.3% agreeing, resulting in a high mean score of 4.120. This suggests that a majority of teachers believe certification is essential for helping students grasp challenging content. A small portion of respondents disagreed (10.1%) or strongly disagreed (11.1%), indicating a minority view that certification may not be as influential.

For the statement, "A teacher's certification ensures they can effectively explain concepts in a way that enhances student learning in social studies," a majority of teachers also showed agreement, with 57.6% strongly agreeing and 17.7% agreeing, leading to a mean score of 4.050. This reflects a prevalent belief that certification contributes positively to teaching effectiveness. However, 17.7% of respondents disagreed, and a few strongly disagreed (5.1%), suggesting that while certification is generally valued, some teachers may question its impact on teaching quality.

The third statement, "Social studies test scores are a better indicator of a teacher's effectiveness than their certification status," had the highest agreement levels, with 76.9% strongly agreeing and 12.0% agreeing, giving a mean score of 4.531. This suggests a strong perception among teachers that student test scores may more accurately reflect teaching effectiveness than certification alone. Lastly, for the statement, "Students learn best from teachers who are experts in social studies," the majority of teachers expressed strong agreement, with 78.5% strongly agreeing and 5.7% agreeing, resulting in a high mean score of 4.424. This indicates a prevailing belief that subject expertise, potentially more than certification, plays a crucial role in enhancing student learning. The data suggests that teachers in Nyarugenge district value both certification and subject expertise in teaching social studies.

Through the interview, head teachers were asked how professional development programs for teachers impact student learning in social studies. Majority of head teachers answered that professional development programs for teachers have a significant impact on student learning in social studies. These programs equip teachers with updated instructional strategies, which are essential for engaging students with complex social studies content. For instance, training on differentiated instruction enables teachers to tailor their approaches to meet diverse learning needs, making topics like history, geography, and civics more accessible and relevant. When teachers gain new strategies for fostering critical thinking, they are better able to encourage students to analyze social studies material thoughtfully, thereby deepening their understanding and retention of key concepts.

Moreover, professional development programs enhance teachers' confidence and motivation, which directly benefits students. When teachers feel supported and competent, they are more likely to deliver lessons that inspire curiosity and active participation among students. Professional development also fosters collaboration among teachers, allowing them to share best practices and resources, which ultimately enriches the learning environment. In social studies, where context and current events are continually evolving, professional development ensures that teachers are well-prepared to address contemporary issues, connect lessons to real-world situations, and help students develop informed perspectives—critical skills for responsible citizenship.

The findings in Table 4.7 align with research by Desimone (2019), Yoon et al. (2017), and Cochran et al. (2019), which emphasizes the positive impact of teacher certification and subject expertise on student learning outcomes. A consensus among the majority of teachers in this study echoes Desimone's findings that certified teachers are more effective in facilitating student comprehension of complex content, likely due to enhanced pedagogical skills. Similarly, Yoon et al. (2017) argued that certification supports a teacher's ability to deliver subject matter effectively, resonating with the high agreement seen for statements about certification's role in explaining concepts in social studies. However, in line with Cochran et al. (2019), there is a notable preference among participants for student test scores as an indicator of teacher effectiveness over certification status alone, underscoring a belief that student outcomes are a more direct measure of teaching success. Collectively, these findings reinforce the significance of certification while acknowledging that expertise and tangible student results are also critical indicators of teacher effectiveness.

2.2 Effects of Teachers' Change of Teaching Methodologies on Students' Learning Motivation

The second objective of this study was to determine the effects of teachers' change of teaching methodologies on students' learning motivation in public primary schools in Nyarugenge district, Rwanda. The researcher pursued this goal by utilizing surveys and conducting interviews. Participants needed to express their agreement or disagreement with various statements evaluating the objective assigned to them. The evaluation of statements corresponds to the scale of 1 for strongly disagree (SD), 2 for disagree (D), 3 for neutral (N), 4 for agree (A), and 5 for strongly agree (SA). Every statement was evaluated for its frequency, percentage, mean, and standard deviation, yielding insights into the level of consensus or dissent among participants.

Table 3. Teachers' Answers on the Effects of Teachers' Change of Teaching Methodologies on Students' Learning Motivation

Statements	SD		D		N		A		SA		Mean	St. Dev
	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
When teachers use a variety of methods to teach social studies, students are more likely to find the subject interesting and stay motivated.	8	2.5	38	12.0	0	0.0	72	22.8	198	62.7	4.310	1.114
Students can become disengaged from social studies if the teacher relies solely on lectures and textbooks.	17	5.4	46	14.6	0	0.0	63	19.9	190	60.1	4.148	1.284
Incorporating simulations, debates, and group projects into social studies lessons can be more motivating for students than traditional methods.	14	4.4	3	0.9	0	0.0	47	14.9	252	79.7	4.645	.905
The best way to motivate students in social studies is not just by making the subject itself interesting, but also by using engaging teaching methods.	11	3.5	24	7.6	6	1.9	52	16.5	223	70.6	4.430	1.077

Field data (2024)

The table 3 reflects teachers' perceptions of how changing teaching methodologies can influence students' motivation to learn social studies in public primary schools in Nyarugenge district. In response to the statement, "When teachers use a variety of methods to teach social studies, students are more likely to find the subject interesting and stay motivated," 62.7% of teachers strongly agreed and 22.8% agreed, yielding a high mean score of 4.310. This indicates a strong belief among teachers that varied instructional approaches can enhance student interest and motivation, underscoring the importance of adaptability in teaching methods for maintaining student engagement.

For the statement, "Students can become disengaged from social studies if the teacher relies solely on lectures and textbooks," the majority of respondents agreed, with 60.1% strongly agreeing and 19.9% agreeing, resulting in a mean of 4.148. This suggests that many teachers recognize the limitations of traditional lecture-based approaches, which may lead to student disengagement if not complemented by more interactive methods. Teachers seem aware that an overreliance on passive learning materials like textbooks can hinder students' enthusiasm for social studies.

In response to, "Incorporating simulations, debates, and group projects into social studies lessons can be more motivating for students than traditional methods," a significant majority of teachers expressed strong agreement, with 79.7% strongly agreeing and 14.9% agreeing, yielding the highest mean score of 4.645. This overwhelming agreement reflects a strong preference for interactive and experiential learning activities, suggesting that teachers believe these methods are particularly effective in fostering student motivation by making learning active and relatable.

Lastly, for the statement, "The best way to motivate students in social studies is not just by making the subject itself interesting, but also by using engaging teaching methods," 70.6% of teachers strongly agreed and 16.5% agreed, resulting in a high mean score of 4.430. This response highlights teachers' belief that motivation in social studies depends not only on the content but also on the delivery. Teachers appear to support the notion that instructional techniques play a crucial role in capturing students' interest and motivation. These data reveal that teachers in Nyarugenge district widely recognize the positive impact of diverse and interactive teaching methodologies on student motivation in social studies.

Majority of school head teachers, through the interview, responded that they have observed a noticeable difference in how students engage with social studies when teachers implement new teaching strategies acquired through in-service training programs. When teachers bring in fresh, interactive methods—such as group discussions, simulations, role-playing, and project-based learning—students seem to respond with heightened interest and enthusiasm. Rather than passively absorbing information, students actively participate in the learning process, which deepens their understanding of complex social

studies topics. For instance, in lessons where teachers incorporate debates or case studies, students become more involved and eager to express their opinions, connect historical events to current issues, and critically analyze different perspectives. This level of engagement is rarely seen in traditional, lecture-based lessons.

Moreover, these new strategies have positively affected students' motivation and confidence. Teachers who have undergone in-service training are often better equipped to create inclusive classrooms where every student feels valued and encouraged to contribute. By implementing varied instructional techniques that cater to different learning styles, they make social studies more accessible and enjoyable for all students. As a result, I have seen students who were previously uninterested or struggling with social studies begin to actively participate and show genuine curiosity about the subject. This shift in engagement not only enhances learning outcomes but also helps students develop skills like critical thinking, collaboration, and empathy, which are essential for their overall growth and success. In my experience, in-service training programs are invaluable in empowering teachers to create dynamic learning environments that foster meaningful student engagement in social studies.

The findings in Table 4.8 resonate with research by Walsh (2021), Ingersoll (2023), and Sanders & Rivers (2016), who all emphasize the significance of diverse teaching methods on student motivation and engagement. Walsh (2021) highlights that students are more responsive and motivated when teachers use interactive approaches, which aligns with the high agreement among teachers in this study on the value of varied instructional methods. Similarly, Ingersoll (2023) found that traditional methods, like lectures, can lead to disengagement—echoed by the majority of teachers here who acknowledged the limitations of relying solely on textbooks. Sanders & Rivers (2016) further support these findings by demonstrating that techniques such as simulations and group activities foster active learning and deeper comprehension. The consensus across studies and the present findings underlines that diverse, engaging methodologies are essential for cultivating sustained student interest and enhancing motivation in social studies.

2.3 Influence of Teacher's Curriculum Mastery on Students' Participation in Learning

The third objective of the study focuses on assessment of the influence of teachers' curriculum mastery on students' participation in learning in public primary schools the Nyarugenge district, Rwanda. To reach the objectives, the researcher created questionnaires for both students and teachers, as well as an interview guide for school principals. Participants were asked to evaluate the statements according to their level of agreement on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree) to convey their opinions. The survey posed multiple questions to the participants to assess their views, and the results are presented in tables.

Table 4: Curriculum Mastery and Students' Participation in Learning

Statements	SD Fr	%	D Fr	%	N Fr	%	A Fr	%	SA Fr	%	Mean	St. Dev
My strong understanding of the social studies curriculum allows me to create engaging lessons that encourage student participation in discussions.	0	0.0	6	1.9	0	0.0	34	10.8	276	87.3	4.835	.502
When I struggle with specific social studies concepts, it's more difficult to facilitate class activities and foster meaningful student engagement.	18	5.7	23	7.3	11	3.5	46	14.6	218	69.0	4.338	1.190
Feeling confident in my social studies knowledge allows me to better answer student questions and guide their analysis of primary sources, which increases participation.	17	5.4	17	5.4	4	1.3	42	13.3	236	74.7	4.465	1.116
Students are more likely to be actively engaged in my social studies class when they sense my passion for the subject and my expertise in the curriculum.	13	4.1	25	7.9	3	.9	51	16.1	224	70.9	4.417	1.111

Field data (2024)

The table 4 illustrates teachers' perceptions regarding the impact of their curriculum mastery on students' participation in social studies learning in public primary schools in Nyarugenge district. In response to the statement, "My strong understanding of the social studies curriculum allows me to create engaging lessons that encourage student participation in discussions," the overwhelming majority of teachers agreed, with 87.3% strongly agreeing and 10.8% agreeing, yielding a high mean score of 4.835. This consensus indicates that teachers believe a deep mastery of the curriculum enables them to deliver lessons that actively involve students, fostering meaningful discussions and engagement.

For the statement, "When I struggle with specific social studies concepts, it's more difficult to facilitate class activities and foster meaningful student engagement," 69% of teachers strongly agreed, and 14.6% agreed, resulting in a mean of 4.338. This response suggests that teachers recognize the challenges of student engagement when they are less confident in their subject knowledge. The perceived difficulty in conducting interactive activities and maintaining engagement highlights the importance of curriculum mastery for effective teaching and student involvement.

Regarding the statement, "Feeling confident in my social studies knowledge allows me to better answer student questions and guide their analysis of primary sources, which increases participation," the majority of teachers also expressed agreement, with 74.7% strongly agreeing and 13.3% agreeing, giving a mean score of 4.465.

This indicates that confidence in subject knowledge is seen as essential for guiding students effectively, answering their questions thoroughly, and enhancing their analytical skills. Such confidence appears to play a crucial role in promoting active participation in learning activities. Finally, for the statement, "Students are more likely to be actively engaged in my social studies class when they sense my passion for the subject and my expertise in the curriculum," 70.9% of teachers strongly agreed, and 16.1% agreed, resulting in a mean score of 4.417. This response reflects the belief that teachers' enthusiasm and expertise positively influence student engagement, as students are more motivated when they perceive their teacher's passion and knowledge. Teachers believe that their confidence and passion for the subject, along with a strong grasp of curriculum content, are essential for fostering an engaging learning environment. This aligns with the idea that well-prepared and knowledgeable teachers are better able to inspire active student involvement and meaningful classroom discussions.

An interview with head teachers revealed that in-service training programs that focus on inclusive teaching practices and effective classroom management are the most valuable for helping teachers create welcoming environments in social studies classrooms. Training sessions that emphasize understanding diverse learning needs and cultural backgrounds equip teachers with strategies to make all students feel seen, valued, and respected. For instance, sessions on cultural competence help teachers acknowledge and celebrate students' backgrounds, allowing them to incorporate relevant examples and perspectives into social studies lessons. This inclusive approach fosters a classroom atmosphere where students feel more comfortable sharing their own views and engaging in discussions without fear of judgment or exclusion. Additionally, in-service training on active listening and communication skills is particularly beneficial for creating a supportive classroom environment. When teachers learn to listen to students attentively and respond thoughtfully, students feel more encouraged to participate. Training that introduces strategies for facilitating respectful discussions, such as setting clear expectations for interactions and using positive reinforcement, also helps build students' confidence in sharing their ideas. Furthermore, sessions that focus on collaborative learning techniques, like group projects and peer discussions, are valuable for establishing a sense of community in the classroom. These activities help students feel that their contributions matter and that learning is a shared experience, enhancing their willingness to engage and voice their perspectives on social studies topics.

The findings from Table 4 align with previous research by Fredricks et al. (2019), Wang & Reeves (2016), and Clark (2019), which emphasize the role of curriculum mastery in fostering student engagement. Fredricks et al. (2019) argue that teachers who have a strong understanding of curriculum content can deliver more engaging lessons, mirroring the high percentage of teachers in this study who believe their curriculum expertise enhances student participation. Similarly, Wang & Reeves (2016) highlight that when teachers struggle with subject knowledge, it hinders their ability to facilitate interactive activities, resonating with responses here where teachers reported challenges in fostering engagement when unsure of specific concepts. Clark (2019) further supports these findings by illustrating that teachers' confidence and passion for a subject significantly boost student motivation. The alignment across these studies and the current findings underscore that teachers' curriculum mastery not only bolsters student engagement but also enhances participation by making classroom discussions more meaningful and inclusive.

Correlation Analysis

This research focused on two broad variables namely dependent and independent variables. The independent variable was measured in terms of In-service teacher training, Teacher certifications, Teacher's change of teaching methodologies, Teacher's curriculum mastery. The dependent variable was students' learning outcomes in social studies and was measured by Students learning outcomes, Increased academic performance (e.g. grades, score), Improved learner's motivation, Improved learner's participation. In analyzing the effect of hands-on skills laboratory practices on students' skills achievement in physics, the determination of association of these variables is important by conducting correlation analysis to ascertain whether they are positively associated or negatively associated.

Table 5 Correlation Coefficients In-service Teacher Training Programs on Students' Learning Outcomes in Social Studies

Statement		In-service teacher training	Teacher certifications	Teacher's change of teaching methodologies	Teacher's curriculum mastery
In-service teacher training	Pearson correlation	1	.646**	.534**	.719**
	Sig. (2-tailed)		.060	.062	.068
	N	316	316	316	316
Teacher certifications	Pearson correlation	.646**	1	.327**	.528**
	Sig.(2-tailed)	.060		.046	.061
	N	316	316	316	316
Teacher's change of teaching methodologies	Pearson correlation	.534**	.627**	1	.535**
	Sig.(2-tailed)	.062	.046		.058
	N	316	316	316	316
Teacher's curriculum mastery	Pearson Correlation	.719**	.528**	.535**	1
	Sig.(2-tailed)	.068	.061	.058	
	N	316	316	316	316

** Correlation is significance at the 0.01 level (2-tailed)

Field data (2024)

The table presents correlation coefficients that examine the relationships between in-service teacher training programs and various teacher factors, such as certifications, changes in teaching methodologies, and curriculum mastery, in relation to student learning outcomes in social studies. The Pearson correlation coefficient for in-service teacher training and teacher curriculum mastery is notably high at 0.719, indicating a strong positive relationship. This suggests that teachers who participate in in-service training programs tend to develop a stronger mastery of the curriculum, which is essential for improving students' understanding and engagement in social studies. Although the p-value for this correlation is 0.068, slightly above the typical 0.05 threshold, it still suggests a meaningful relationship, emphasizing the value of in-service training for enhancing teachers' curriculum knowledge.

In-service teacher training also shows a moderate positive correlation with teacher certifications (0.646) and teacher changes in teaching methodologies (0.534). This implies that teachers who engage in in-service training may be more likely to pursue certifications and adapt their teaching strategies, both of which are linked to improved student learning outcomes. The correlation between in-service training and teacher certification, with a significance value of 0.060, highlights the potential impact of professional development on encouraging further formal qualifications, which can enrich classroom instruction. Similarly, the relationship between in-service training and changes in teaching methodologies (p=0.062) suggests that training programs may encourage teachers to diversify and improve their instructional approaches, promoting a more dynamic learning environment for students.

Lastly, the positive correlation between teacher certifications and changes in teaching methodologies (0.327) indicates that certified teachers are more likely to modify and innovate in their teaching methods. Meanwhile, curriculum mastery is positively correlated with both in-service training (0.719) and change of teaching methodologies (0.535), reinforcing the idea that teachers with comprehensive curriculum knowledge can better adapt their teaching methods to meet students' needs. Overall, these correlations suggest that in-service training, teacher certifications, changes in teaching methods, and curriculum mastery are interrelated factors that collectively contribute to enhancing students' learning outcomes in social studies. The data indicates that strengthening teacher development in these areas could have a synergistic effect on student engagement and achievement.

Table 6: Regression Analysis Model

Model	R	R Square	Adjusted R Square	Std. Error of the estimate	Durbin-Watson
1	.855[a]	.717	.811	.21325	.742

a. Predictors: (Constant), In-service Teacher Training Programs

b. Dependent Variable: Students' Learning Outcomes in Social Studies

Field data (2024)

The regression table shows the relationship between in-service teacher training programs (predictor variable) and students' learning outcomes in social studies (dependent variable). The R value of 0.855 indicates a strong positive correlation between in-service teacher training and students' learning outcomes, suggesting that these training programs are closely associated with improved student performance in social studies. The R Square value of 0.717 reveals that 71.7% of the variance in students' learning outcomes can be explained by in-service teacher training programs alone, highlighting the significant impact of these programs. The adjusted R Square value of 0.811, which is close to the R Square, suggests that the model is a good fit and would likely generalize well to other data sets. Additionally, the Durbin-Watson value of 0.742 indicates that there may be some positive autocorrelation in the residuals, which could affect the reliability of the model but would need further investigation. Overall, the data suggest that in-service teacher training plays a critical role in enhancing students' learning outcomes in social studies.

IV. CONCLUSION

The findings of this study provide clear insights into the effects of teacher certification, teaching methods, and curriculum mastery on student engagement and performance in Rwandan public primary schools. Regarding the first research question on the impact of teacher certification, the study reveals that higher levels of teacher certification are positively associated with student academic performance. Certified teachers appear more adept at managing classroom dynamics, assessing student needs, and applying effective teaching strategies. This results in a more conducive learning environment that fosters student understanding and achievement. The evidence suggests that teacher certification is not only a marker of formal qualifications but also a critical factor in enhancing instructional quality and ultimately improving student outcomes.

In addressing the second research question, the study highlights the significant influence of varying teaching methods on student motivation. When teachers incorporate diverse instructional techniques—such as group discussions, interactive simulations, and project-based learning—students demonstrate increased interest and sustained motivation in their studies. Teachers who rely solely on traditional lecture-based approaches often observe lower student engagement, whereas the adoption of active and collaborative methods appears to boost enthusiasm for learning. This finding underscores the importance of adaptive and varied teaching methodologies in creating an engaging learning atmosphere, which is instrumental in motivating students and enhancing their learning experiences.

Finally, regarding the third research question on curriculum mastery, the study finds that teachers' deep understanding of the curriculum is essential for fostering active student participation. Teachers who have strong content knowledge can design more engaging lessons and are better equipped to answer student questions, thus encouraging students to participate more confidently in discussions and learning activities. Conversely, teachers who struggle with certain curriculum concepts find it challenging to facilitate meaningful classroom interactions. This highlights the critical role of curriculum mastery in making learning relatable and inclusive, ultimately increasing student engagement and fostering a more interactive and participatory classroom environment. Collectively, these findings suggest that teacher qualifications, adaptive teaching methods, and curriculum expertise are integral to improving student outcomes in Rwandan public primary schools.

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