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The Impact of Project RIPPLES on the Performance of Junior High School Science Teachers in Nueva Vizcaya

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A B S T R A C T

This study assessed the impact of Project RIPPLES (Realizing Improvement in Science Performance and Professional Development through Learning Action Cell and Engagement of Science Educators and Leaders) on the performance of permanent Junior High School Science teachers in the Northern District Secondary Schools of the Schools Division Office (SDO) of Nueva Vizcaya, as the basis for a proposed Developmental Plan. Utilizing a quantitative descriptive-comparative research design, the study analyzed teachers' Individual Performance Commitment and Review Form (IPCRF) ratings, while responses from semi-structured interviews were subjected to thematic analysis to provide additional context for the quantitative findings. Data were gathered from 66 permanent Junior High School Science teachers through complete enumeration. Quantitative performance data were obtained from IPCRF ratings across the Key Result Areas (KRAs) and Plus Factor over a four-school-year period. Frequency count, percentage, weighted mean, standard deviation, independent samples t-test, one-way analysis of variance (ANOVA), Scheffé post hoc test, and paired samples t-test were employed to analyze the data.

Findings revealed that the respondents demonstrated an Outstanding level of performance both before and during the implementation of Project RIPPLES. Prior to implementation, statistically significant differences were observed only when teachers were grouped according to years in teaching and school category in selected indicators; age and sex did not significantly influence performance. During implementation, school category remained the only profile variable showing significant differences in selected KRAs, while age, sex, and years in teaching showed no significant differences. Using proportional mean scores to account for differences in IPCRF weights across years, the comparison revealed significant changes in Key Result Area 1, Key Result Area 2, Key Result Area 3, and the Overall Rating. Scores increased in Key Result Area 1 and the Overall Rating, decreased in Key Result Area 2 and Key Result Area 3, and remained unchanged in Key Result Area 4 and the Plus Factor. Interview responses further indicated that while Project RIPPLES contributed to instructional improvement and professional growth, performance was also shaped by school leadership, collegial collaboration, mentoring, teaching experience, resource availability, and participation in other professional development activities.

The study concludes that Project RIPPLES served as a valuable professional development initiative that supported teachers' competence and sustained their high performance. However, outcomes reflected the combined influence of the project and broader professional and contextual factors rather than the project alone. It is recommended that the Schools Division Office sustain Project RIPPLES while strengthening mentoring systems, collaborative learning, differentiated support, curriculum planning, and school-based mechanisms through the proposed Developmental Plan.

Keywords: Learning Action Cell, professional development, IPCRF, science education, Nueva Vizcaya

1. Introduction

Quality education is central to sustainable development, with the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2014) affirming that progress begins with learning — a commitment further anchored in United Nations Sustainable Development Goal 4, which seeks inclusive, equitable quality education for all. In the Philippines, the Philippine Professional Standards for Teachers (PPST) recognizes that quality learning depends fundamentally on quality teaching, making teacher professional development a national priority. Yet student achievement remains a persistent concern: declining National Achievement Test (NAT) results and low standing in the Programme for International Student Assessment (PISA) highlight gaps in science education that demand targeted, evidence-based intervention (Morallo & Abay, 2019; Añar, Barroso, & Manlagaylay, 2023; OECD, 2023).

Teacher performance encompasses more than instructional delivery; it reflects professional competence, classroom practice, and student outcomes, shaped by leadership, school culture, and sustained professional growth (Wongmahesak et al., 2025; AlAli & Al-Barakat, 2025; Kanya et al., 2021). To measure this, the Department of Education (DepEd) uses the Individual Performance Commitment and Review Form (IPCRF) under the Results-Based Performance Management System (RPMS), aligned with the PPST and covering content knowledge, learning environment, curriculum planning, assessment, and professional development (DepEd Order No. 2, s. 2015). While the suspension of RPMS under Executive Order No. 61, s. 2024 aimed to streamline workload, the tool remains a valid, comprehensive measure of year-round teacher performance and was resumed in July 2025. Studies

confirm that frameworks such as the PPST guide more meaningful evaluation and improvement, making the IPCRF a reliable basis for tracking progress over time (Gepila, 2020).

Professional development programs (PDPs) are recognized globally as essential to strengthening teaching practice and student learning. Effective PDPs are sustained, collaborative, context-responsive, and practice-focused — combining content mastery, active learning, and collective participation rather than one-time workshops (Desimone, 2009; Darling-Hammond et al., 2017; Bautista & Ortega-Ruíz, 2015). In the Philippines, the Learning Action Cell (LAC), institutionalized through DepEd Order No. 35, s. 2016 as a school-based professional learning community, embodies this approach. Adapted from Japan's Lesson Study and aligned with Republic Act No. 10533 (K to 12 Basic Education Act), LAC operates through planning, implementation, and reflection phases, enabling teachers to collaboratively address real instructional challenges (Mendoza et al., 2017). Evidence nationally shows LAC improves professional skills, content knowledge, instructional practice, and performance ratings (Cortejo, 2022; Verbo, 2020; Magundayao, 2023; Binauhan, 2021; Macayanan & Abalos, 2023; Hilario, 2024; Aquino et al., 2023).

In the Schools Division of Nueva Vizcaya, these principles guided the launch of Project RIPPLES (Realizing Improvement in Science Performance and Professional Development through Learning Action Cell and Engagement of Science Educators and Leaders), established under Division Memorandum No. 78, s. 2019. As a science-specific, division-led contextualized LAC initiative, it standardizes topics while allowing school-level adaptation, later organized under the SCIENTIA framework to focus on literacy, innovation, materials development, and laboratory improvement. Implemented through School Learning Action Cells (SLAC) and integrated into School Improvement Plans, the program continued through virtual sessions during the COVID-19 pandemic and remains a core strategy for supporting secondary science teachers.

However, the impact of Project RIPPLES over time has not yet been systematically assessed. While LAC studies elsewhere report positive outcomes, challenges persist: workload burden, scheduling conflicts, resource limitations, misalignment with actual teacher needs, and variable implementation quality can weaken program effectiveness (Guskey, 2002; Grape, 2024; Sales, 2024; Vega, 2020; Ramli et al., 2024). Some studies find only modest or weak correlation between LAC participation and performance ratings, suggesting that context, duration, and implementation fidelity matter greatly (Gulben, 2025; Acerit, 2025). Most existing LAC research focuses on single schools, short-term observation tools such as the Classroom Observation Tool (COT–RPMS), or general teaching areas — not specialized science programs. No published study has yet examined Project RIPPLES' influence on teacher performance across multiple years using comprehensive, year-end IPCRF ratings as a sustained measure.

Addressing this gap, the present study evaluates changes in science teacher performance before and during the implementation of Project RIPPLES in the Northern District of SDO Nueva Vizcaya. Drawing on four consecutive school years of IPCRF data, it examines whether participation correlates with improved performance, identifies strengths and implementation gaps, and produces evidence-based findings to inform a Proposed Developmental Plan. By widening geographic and participant coverage and extending assessment beyond short-term observation, this work builds on Hilario (2024), Magundayao (2023), and Vega (2020) to offer deeper insight into how contextualized, division-led professional development can strengthen science teaching and learning outcomes in the region.

1.1 Objectives of the Study

The primary objective of this study was to evaluate the long-term impact of Project RIPPLES on the performance rating of secondary science teachers in the Northern Districts of SDO Nueva Vizcaya over its three-year implementation. This study aimed to:

1. determine the profile of the respondents in terms of age, sex, years in teaching, and school category.
2. determine the level of performance of the respondents in their performance rating before the implementation of Project RIPPLES in the following areas:
    - 2.1. Content Knowledge and Pedagogy
    - 2.2. Learning Environment and Diversity of Learners
    - 2.3. Curriculum and Planning
    - 2.4. Assessment and Reporting
    - 2.5. Plus Factor
    - 2.6. Overall Rating
3. Determine the average level of performance of the respondents in the performance rating after the implementation of Project RIPPLES in the following areas:
    - 3.1. Content Knowledge and Pedagogy
    - 3.2. Learning Environment and Diversity of Learners
    - 3.3. Curriculum and Planning
    - 3.4. Assessment and Reporting

3.5. Plus Factor

3.6. Overall Rating

4. Determine if there is a significant difference in the performance rating of the respondents before the implementation of Project RIPPLES when grouped according to the profile variables.
5. Determine if there is a significant difference in the performance rating of the respondents after the implementation of Project RIPPLES when grouped according to the profile variables.
6. Determine the difference in the performance rating of the respondents before and after the implementation of Project RIPPLES.
7. Craft a developmental plan based on the study's findings to strengthen the implementation of Project RIPPLES.

1.2 Hypotheses

The hypotheses that were tested in this study are:

1. There is no significant difference in the performance rating of the respondents before the implementation of Project RIPPLES when grouped according to the profile variables.
2. There is no significant difference in the performance rating of the respondents during the implementation of Project RIPPLES when grouped according to the profile variables.
3. There is no significant difference in the performance rating of the respondents before and during the implementation of Project RIPPLES.

1.3 Conceptual Framework

This study's conceptual framework is based on Social Learning Theory (SLT), proposed by Albert Bandura. SLT suggests that learning occurs within a social context through observation, imitation, and modeling. It highlights the significance of social interactions and the environment in shaping individuals' learning processes and behaviors (TechTarget, 2024).

In the field of professional development for teachers, SLT provides a strong foundation for understanding how educators acquire new skills and knowledge. By observing and interacting with peers, mentors, and experts, teachers can model effective practices and integrate them into their own teaching. This process is particularly relevant in initiatives like Project RIPPLES, where collaborative learning and shared experiences are central to professional growth.

A systematic literature review by Aquino et al. (2023) supports this framework, showing that active participation in SLAC sessions correlates with increased teacher self-efficacy, as evidenced by greater confidence in implementing innovative pedagogical strategies. SLAC sessions also act as catalysts for tangible changes in instructional practices, fostering adaptability among educators and leading to improved student engagement and learning outcomes. Additionally, SLAC sessions are crucial in building a collaborative professional community. These professional development activities provide teachers with ongoing opportunities to refine their skills and apply new knowledge, essential for continuous improvement in teaching practices.

Figure 1 presents the study's conceptual framework using the Input–Process–Output–Outcome (I-P-O-O) model. It illustrates how Project RIPPLES as Input is implemented through LAC sessions and related activities as Process, resulting in measured changes in IPCRF performance ratings, before and after implementation, as Output. These findings then serve as the basis for a Proposed Development Plan as Outcome, designed to further strengthen science teacher professional development.

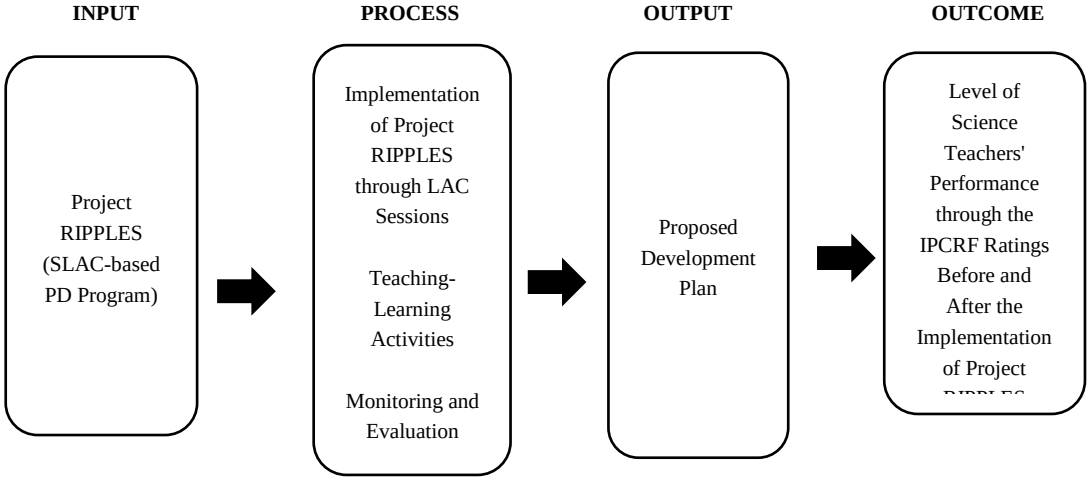


Figure 1. Impact of Project RIPPLES on Teacher Performance

2. METHODOLOGY

2.1 Research Design

This study employed a quantitative descriptive-correlational research design supplemented by qualitative data through semi-structured interviews, to examine the impact of Project RIPPLES on Junior High School (JHS) public Science teachers' performance in the Northern District of the Schools Division Office (SDO) of Nueva Vizcaya. Quantitative data obtained from the Individual Performance Commitment and Review Form (IPCRF) ratings served as the primary source of information, while qualitative data gathered through semi-structured interviews provided additional insights and explanations regarding the findings.

The descriptive aspect of the study was utilized to describe the respondents' profile in terms of age, sex, years in teaching, and school category, as well as to determine the level of teachers' performance before and after the implementation of Project RIPPLES. Frequency counts, percentages, means, and standard deviations were used to summarize and present the data.

The correlational aspect of the study focused on examining variations in teacher performance across profile variables and implementation periods using inferential statistical procedures. Specifically, the independent samples t-test and one-way analysis of variance (ANOVA) were employed to determine whether significant differences existed in teachers' performance when grouped according to profile variables, while the paired samples t-test was used to determine whether significant differences existed between teachers' performance before and after the implementation of Project RIPPLES. These analyses provided empirical evidence regarding the impact of the project on teacher performance.

2.2 Sampling Procedure

This study employed complete enumeration in selecting the respondents. The target population consisted of all permanent public Junior High School (JHS) science teachers assigned to the 18 secondary schools in the Northern District of the Schools Division Office (SDO) of Nueva Vizcaya, Philippines.

Prior to final selection, the population was screened for eligibility. Two schools (1 small school and 1 medium school) were excluded from the sampling frame because they had no permanent JHS science teachers who met the inclusion criteria. Additionally, the researcher was excluded to prevent potential conflict of interest and ensure objectivity. After these exclusions, the final eligible population consisted of 66 permanent science teachers, distributed across 16 participating schools and categorized by school enrollment size as Small, Medium, Large, and Very Large.

Given the relatively small and bounded population size ($N = 66$), complete enumeration was determined to be the most appropriate sampling strategy. This approach ensures that every eligible teacher was invited to participate, thereby eliminating sampling error and maximizing the comprehensiveness and representativeness of the data.

2.3 Research Instrument

The primary instrument is the IPCRF-based questionnaire, designed to capture teacher performance ratings across the official Key Result Areas (KRAs) used by the Department of Education. Specifically, the instrument gathers ratings for KRA 1 (Content Knowledge and Pedagogy); KRA 2 (Learning Environment and Diversity of Learners); KRA 3 (Curriculum and Planning); KRA 4 (Assessment and Reporting); and the Plus Factor. Consistent with the scope of this study, KRA 5 was excluded due to inconsistencies in indicators and rating criteria across the school years covered. The instrument collects performance ratings for the baseline period (SY 2020–2021) and the three-year implementation period (SY 2021–2022, SY 2022–2023, and SY 2023–2024), allowing for direct before-and-after comparison.

The IPCRF ratings are interpreted using DepEd's official performance scale such as Outstanding (4.500–5.000), Very Satisfactory (3.500–4.499), Satisfactory (2.500–3.499), Fair (1.500–2.499), and Needs Improvement (1.000–1.499). The questionnaire also includes a section to gather the respondents' profile — age, sex, years in teaching, and school category — to support comparative analysis.

As a supplementary instrument, semi-structured questions were included to elicit teachers' experiences, observations, and perceptions regarding Project RIPPLES and its implementation. These open-ended responses provide context and explanation for the quantitative trends observed, offering a more comprehensive understanding of the program's impact.

Originally, the researcher intended to collect data through direct document scanning of official IPCRF records. However, due to teachers' concerns regarding the confidentiality of their individual ratings, the method was revised in consultation with the research adviser. Instead, respondents provided their own aggregated performance ratings through the questionnaire, ensuring privacy while maintaining data integrity. Both printed and Google Form versions of the instrument were made available to accommodate respondents in both accessible and remote schools.

To ensure validity, the instrument was patterned directly after the official DepEd IPCRF structure and content, aligned with the study's objectives and research questions. The semi-structured questions were reviewed and approved by the research adviser for clarity and relevance. Reliability was maintained through standardized questions and uniform administration across all respondents, whether in printed or digital form. Throughout the process, strict confidentiality and anonymity were observed; all data were reported in aggregate form, and no personal identifiers were included in the analysis.

2.4 Data Analysis

Data were analyzed using descriptive statistics and inferential statistics. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe teachers' demographic profile, performance levels across Key Result Areas (KRAs), and the overall rating before and during the implementation of Project RIPPLES. The IPCRF scoring system was standardized across periods — DepEd Order No. 2, s. 2015 (baseline) and DepEd Order No. 12, s. 2020 (implementation) — by converting scores to a common proportional scale to enable direct comparison; KRA 5 was excluded due to inconsistent indicators. Inferential statistics — independent-samples t-test, one-way ANOVA with Scheffé post hoc, and paired-samples t-test — were employed to examine performance differences by profile variables, identify which groups significantly differ, and measure changes in ratings from baseline to implementation, with significance set at 0.05. Thematic analysis was used to process insights from semi-structured questions and provide deeper context to the quantitative results. Standardized rating ranges appear in Tables 1 and 2.

Table 1 - Standardized Qualitative Descriptions Based on Weighted Scores Across all Performance Indicators and the Overall Rating in the Academic Year 2020-2021

Performance Indicators	Weight	Max Score	Qualitative Description				
			Outstanding	Very Satisfactory	Satisfactory	Unsatisfactory	Poor
KRA 1 – Content Knowledge & Pedagogy	24%	1.20	1.09–1.20	0.84–1.08	0.60–0.83	0.36–0.59	<0.36
KRA 2 – Learning Environment & Diversity of Learners	24%	1.20	1.09–1.20	0.84–1.08	0.60–0.83	0.36–0.59	<0.36
KRA 3 – Curriculum & Planning	16%	0.80	0.72–0.80	0.56–0.71	0.40–0.55	0.24–0.39	<0.24
KRA 4 – Assessment and Reporting	24%	1.20	1.09–1.20	0.84–1.08	0.60–0.83	0.36–0.59	<0.36
Plus Factor	12%	0.60	0.54–0.60	0.42–0.53	0.30–0.41	0.18–0.29	<0.18
Overall Rating	100%	5.00	4.500-5.000	3.500-4.499	2.500-3.499	1.500-2.499	<1.499

Table 2. Standardized Qualitative Descriptions Based on Weighted Scores Across all Performance Indicators and the Overall Rating in the Academic Year 2021-2024

Performance Indicators	Weight	Max Score	Qualitative Description				
			Outstanding	Very Satisfactory	Satisfactory	Unsatisfactory	Poor
KRA 1 – Content Knowledge & Pedagogy	23%	1.15	1.04-1.15	0.81-1.03	0.58-0.8	0.35-0.57	<0.35
KRA 2 – Learning Environment & Diversity of Learners	27%	1.35	1.22-1.35	0.95-1.21	0.68-0.94	0.41-0.67	<0.41
KRA 3 – Curriculum & Planning	21%	1.05	0.95–1.05	0.74–0.94	0.53–0.73	0.32–0.52	<0.32
KRA 4 – Assessment and Reporting	24%	1.20	1.09–1.20	0.84–1.08	0.60–0.83	0.36–0.59	<0.36
Plus Factor	5%	0.25	0.23-0.25	0.18-0.22	0.13-0.17	0.08-0.12	<0.08
Overall Rating	100%	5.00	4.500-5.000	3.500-4.499	2.500-3.499	1.500-2.499	<1.499

3. RESULTS AND DISCUSSION

Demographic Profile of the Respondents

Table 3. Frequency and percentage distribution of the profile of the respondents

Profile		Frequency	Percentage (%)
Age	25-30	9	13.60
	31-35	17	25.80
	36-40	7	10.60

Profile		Frequency	Percentage (%)
	41-45	10	15.20
	46-50	14	21.20
	51-55	3	4.50
	over 55 years old	6	9.10
Sex	Male	17	25.80
	Female	49	74.20
Years in Teaching	4-10 years	28	42.40
	More than 10 years	38	57.60
School Category	Small	3	4.50
	Medium	11	16.70
	Large	27	40.90
	Very Large	25	37.90

Level of Performance Before the Implementation of Project RIPPLES

Using the mean and standard deviation, the results indicate that teachers already demonstrated a high level of performance even before the implementation of Project RIPPLES with an overall mean rating of 4.64 (SD = 0.24), which falls under the Outstanding level of performance. Across all performance indicators, most science teacher respondents fall under the "Outstanding" level of performance.

Specifically, Key Result Area 3 (Curriculum and Planning) recorded the highest proportion of Outstanding ratings at 95.5% (f = 63), followed by the Plus Factor at 86.4% (f = 57), Key Result Area 4 (Assessment and Reporting) at 68.2% (f = 45), Key Result Area 1 (Content and Pedagogy) at 63.6% (f = 42), and Key Result Area 2 (Learning Environment and Diversity of Learners) at 53.0% (f = 35). Standard deviation values across all indicators were consistently low, ranging from SD = 0.05 to SD = 0.09, with the overall SD at 0.24.

The high concentration of Outstanding ratings, particularly in Key Result Area 3 (Curriculum and Planning), suggests strong competence in curriculum planning and instructional alignment. Meanwhile, the slightly higher proportion of Very Satisfactory ratings in Key Result Area 2 (Learning Environment and Diversity of Learners) at 47.0% points to relatively more variation in how teachers manage the learning environment and address learner diversity. The uniformly low standard deviation values across all Key Result Areas imply that performance levels were consistent and closely clustered around the mean, meaning the respondents shared generally comparable performance standings before the project began.

The high baseline performance observed in this study indicates that the teachers entered the intervention period already well-equipped with the necessary professional competencies. This outcome is consistent with the findings of Macayanan and Abalos (2023), who reported that public secondary school teachers typically maintain high IPCRF ratings because of accumulated teaching experience, regular in-service training, and participation in school-based professional development over time. Similarly, Kini and Podolsky (2016) explained that teacher effectiveness grows gradually throughout one's career, shaped by years of practice, mentoring, and exposure to various capacity-building opportunities — suggesting that the Outstanding ratings seen here reflect cumulative professional growth rather than chance.

This explanation is further supported by the qualitative responses gathered from the semi-structured interviews. Several teachers shared that their performance had been strengthened long before Project RIPPLES through supportive leadership, collegial collaboration, and prior professional development — factors identified under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings). For instance, Teacher 01 from a Small School stated*: "Supportive, industrious, and intelligent school head"* as key influences that helped her maintain high performance even before the project was introduced. This account confirms that the strong baseline performance was built upon existing school support systems, consistent with the observation of Darling-Hammond et al. (2017) that positive school culture and instructional leadership significantly contribute to teacher performance independent of specific intervention programs.

The relatively lower Outstanding rating in Key Result Area 2 (Learning Environment and Diversity of Learners) compared to other indicators also aligns with Verbo's (2020) observation that managing inclusive learning environments and addressing learner diversity are areas teachers develop more gradually, often requiring additional time and targeted support. This context helps explain why Key Result Area 2 (Learning Environment and Diversity of Learners) showed the highest proportion of Very Satisfactory ratings at baseline — it represents an area where growth was already underway but had not yet reached uniform Outstanding levels across all respondents.

Table 4. Level of teacher performance across all performance indicators and overall rating BEFORE the Implementation of Project RIPPLES

Performance Indicators		Level of Performance					
		Outstanding	Very Satisfactory	Satisfactory	$\overline{X}$	Std. Dev.	Level of Performance
KRA 1 (Content Knowledge and Pedagogy) – 24%	f	42	24	-	1.13	0.08	Outstanding
	%	63.6	36.4	-			
KRA 2 (Learning Environment & Diversity of Learners) – 24%	f	35	31	-	1.09	0.09	Outstanding
	%	53.0	47.0	-			
KRA 3 (Curriculum and Planning) – 16%	f	63	3	-	0.77	0.05	Outstanding
	%	95.5	4.5	-			
KRA 4 (Assessment and Reporting) – 24%	f	45	21	-	1.12	0.07	Outstanding
	%	68.2	31.8	-			
Plus Factor – 12%	f	57	7	2	0.54	0.05	Outstanding
	%	86.4	10.6	3.0			
Overall Rating – 100%	f	46	20	-	4.64	0.24	Outstanding
	%	69.7	30.3	-			

Level of Performance After the Implementation of Project RIPPLES

Table 5 presents the level of performance of the science teacher respondents during the implementation of Project RIPPLES using the mean and standard deviation.

Table 5. Level of teacher performance across the Key Result Areas (KRAs) and overall rating AFTER Project RIPPLES

Performance Indicators		Level of Performance					
		Outstanding	VS	Outstanding	$\overline{X}$	Outstanding	Level of Performance
KRA 1 (Content Knowledge and Pedagogy) – 24%	f	62	4	-	1.13	0.08	Outstanding
	%	93.9	6.1	-			
KRA 2 (Learning Environment & Diversity of Learners) – 24%	f	-	64	2	1.09	0.09	Outstanding
	%	-	97.0	3.0			
KRA 3 (Curriculum and Planning) – 16%	f	55	11	-	0.77	0.05	Outstanding
	%	83.3	16.7	-			
KRA 4 (Assessment and Reporting) – 24%	f	45	21	-	1.12	0.07	Outstanding
	%	68.2	31.8	-			
Plus Factor – 12%	f	39	27	-	0.54	0.05	Outstanding
	%	59.1	40.9	-			
Overall Rating – 100%	f	40	26	-	4.56	0.14	Outstanding
	%	60.6	39.4	-			

It can be seen that in KRA 1 (Content Knowledge and Pedagogy), 62 science teacher respondents or 93.9% were rated Outstanding, with a mean of 1.13 (SD = 0.08). In KRA 3 (Curriculum and Planning), 83.3% (f = 55) were rated Outstanding, with a mean of 0.77 (SD = 0.05). Key Result Area 4 (Assessment and Reporting) recorded 68.2% Outstanding ratings (f = 45), with a mean of 1.12 (SD = 0.07), while the Plus Factor showed 59.1% Outstanding ratings (f = 39), with a mean of 0.54 (SD = 0.05). Conversely, Key Result Area 2 (Learning Environment and Diversity of Learners) presents a different pattern: 97.0% (f = 64) fell under the Very Satisfactory category rather than Outstanding, with a mean of 1.09 (SD = 0.09). The overall mean rating was 4.56 (SD = 0.14), which falls within the Outstanding level. Standard deviation values across all indicators remained relatively low, ranging from SD = 0.05 to SD = 0.09.

These numerical values indicate that the level of performance of the respondents was sustained at a high level during the implementation of Project RIPPLES. The substantial increase in Outstanding ratings in Key Result Area 1 from 63.6% before to 93.9% during implementation, clearly indicates strengthened competence in content knowledge and pedagogy. Key Result Area 3 also sustained strong performance, while Key Result Area 4 and the Plus Factor maintained the high proficiency observed at baseline. However, Key Result Area 2 shows a distinct trend: although performance remained consistently high, nearly all respondents were rated Very Satisfactory rather than Outstanding. This suggests that while teachers maintained good practice in managing the learning environment, progress toward the Outstanding level in this Key Result Area was not as pronounced as in other areas. The low standard deviation values across all indicators imply that performance levels remained consistent among the respondents throughout the implementation period.

Generally, these results suggest that Project RIPPLES contributed to strengthening teachers' instructional competencies and professional practices throughout the implementation period. This finding supports Darling-Hammond et al. (2017), who emphasized that effective professional development improves teaching practices over time when it is content-focused, promotes active learning, encourages collaboration, provides coaching and feedback, and is sustained rather than delivered as a one-time activity. The sustained high performance and measurable improvements observed in this study are consistent with these characteristics, as Project RIPPLES provided continuous opportunities for teachers to enhance their pedagogical knowledge and instructional practices.

These quantitative results are further explained and supported by the qualitative findings from the semi-structured interviews. Under Theme 1 (Improvement in Teacher Performance and IPCRF Ratings) and Theme 2 (Project RIPPLES' Positive Influence on KRA Objectives), teachers consistently reported improved strategies, better planning, increased learner engagement, and enhanced performance across Key Result Areas. For instance, a teacher respondent from a Very Large School shared: *"With the implementation of Project RIPPLES, my ratings improved in all KRAs…"* while a teacher respondent from a Large School stated: *"My rating improved from Very Satisfactory to Outstanding."* These firsthand accounts directly affirm the improvements observed in the quantitative data, particularly the substantial gains seen in Key Result Area 1.

At the same time, the pattern observed in Key Result Area 2, where performance remained at Very Satisfactory despite overall high ratings, may be understood considering the challenges also identified by the respondents. Under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings) and Theme 4 (Challenges and Limitations of Project RIPPLES), teachers noted that managing inclusive learning environments and addressing learner diversity often requires additional time, resources, and support beyond what the project could provide within the implementation period. As Guskey (2002) explained, changes in certain competencies develop gradually and may become fully visible in formal ratings only after sustained practice, meaning the progress in Key Result Area 2 is underway and consistent but may require more time to fully reflect at the Outstanding level.

Significant Differences in Performance Based on Profile Variables Before the Implementation of Project RIPPLES

This section presents the analysis of differences in the level of performance of the JHS science teacher-respondents before the implementation of Project RIPPLES when grouped according to profile variables.

Age

Table 6. Significant difference in teacher performance when grouped according to Age

Performance Indicators	Age	$\overline{X}$	SD	F	Sig.
KRA 1: Content Knowledge and Pedagogy	25 to 35 years old	1.11	0.09	1.499	0.231
	36 to 45 years old	1.11	0.08		
	46 years old and above	1.15	0.07		
KRA 2: Learning Environment and Diversity of Learners	25 to 35 years old	1.06	0.09	1.738	0.184
	36 to 45 years old	1.10	0.09		
	46 years old and above	1.11	0.09		
KRA 3: Curriculum and Planning	25 to 35 years old	0.76	0.05	0.245	0.783
	36 to 45 years old	0.77	0.05		

Performance Indicators	Age	$\overline{X}$	SD	F	Sig.
	46 years old and above	0.77	0.05		
	25 to 35 years old	1.11	0.08	0.218	0.805
KRA 4: Assessment and Reporting	36 to 45 years old	1.12	0.07		
	46 years old and above	1.12	0.06		
	25 to 35 years old	0.54	0.04	0.464	0.631
Plus Factor	36 to 45 years old	0.55	0.03		
	46 years old and above	0.54	0.06		
	25 to 35 years old	4.59	0.25	0.988	0.378
Overall Rating	36 to 45 years old	4.66	0.24		
	46 years old and above	4.69	0.22		

Using one-way ANOVA, the results reveal that there are no statistically significant differences in teacher performance when grouped according to age across all performance indicators and the overall rating, as all p-values exceed the 0.05 level of significance. Specifically, Key Result Area 1, Key Result Area 2, Key Result Area 3, Key Result Area 4, Plus Factor and the overall rating have the p-values of 0.231, 0.184, 0.783, 0.805, 0.631, and 0.378 respectively. This indicates that age does not appear to influence teacher performance prior to the implementation of Project RIPPLES. Despite slight variations in mean scores, these differences are not substantial enough to be considered statistically meaningful. This suggests that age does not appear to influence teacher performance prior to the implementation of Project RIPPLES.

This finding aligns with Macayanan and Abalos (2023), who found that teacher performance is not determined by age alone but by the extent of professional engagement and continuous participation in development opportunities. This is further supported by the qualitative findings under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), where respondents identified experience and teaching background, prior professional development, and school leadership support, rather than age, as the key factors that shaped their baseline performance. This explains why teachers across different age groups demonstrated comparable performance levels: they shared similar foundational support and professional growth opportunities regardless of age.

Sex

Using the independent samples t-test, Key Result Area 1 (p=0.802), KRA 2 (p=0.142), Key Result Area 3 (p=0.105), Key Result Area 4 (p=0.875), Plus Factor (p=0.676), and the Overall Rating (p=0.922) has p-values that exceeds 0.05 indicating no significant differences between male and female teachers when performance is grouped according to sex as shown in Table 7.

The result suggests that performance is relatively consistent regardless of gender, reinforcing the notion that professional competence is not determined by sex. This finding supports Alnahdi and Schwab (2023), who emphasized that teaching effectiveness is influenced more by professional practice, training, and experience than by demographic variables such as sex. The qualitative findings reinforce this conclusion: the supportive and challenging factors identified under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), including *"leadership support", "collegial collaboration", "workload",* and *"resource limitations",* were cited consistently by teachers regardless of sex. No gender-specific patterns emerged in the interview responses, indicating that male and female teachers in this study operated under similar conditions and demonstrated comparable professional competence.

Table 7. Significant difference when grouped according to Sex

Performance Indicators	**Sex**	$\overline{X}$	**SD**	**t**	**Sig.**
KRA 1: Content Knowledge and Pedagogy	Male	1.13	0.07	0.252	0.802
	Female	1.12	0.08		
KRA 2: Learning Environment and Diversity of Learners	Male	1.06	0.09	-1.499	0.142
	Female	1.10	0.09		
KRA 3: Curriculum and Planning	Male	0.78	0.03	1.653	0.105
	Female	0.76	0.06		
KRA 4: Assessment and Reporting	Male	1.12	0.07	0.158	0.875

Performance Indicators	**Sex**	$\overline{X}$	**SD**	**t**	**Sig.**
	Female	1.12	0.07		
Plus Factor	Male	0.55	0.04	0.420	0.676
	Female	0.54	0.05		
Overall Rating	Male	4.64	0.23	-0.099	0.922
	Female	4.65	0.24		

Years in Teaching

Using the independent samples t-test, Table 8 showed that most performance indicators show no significant difference when grouped according to years in teaching. In particular, Key Result Area 1 (p=0.056), Key Result Area 3 (p=0.126), Key Result Area 4 (p=0.096), Plus Factor (p=0.685) recorded p-values that is greater than 0.005. However, significant differences are observed in Key Result Area 2 (p=0.011) and in the Overall Rating (p=0.017). In terms of mean, it is observed that teachers with more than 10 years of experience tend to have slightly higher mean scores in these areas compared to those with fewer years of experience.

This finding supports Kini and Podolsky (2016), who highlighted that teaching experience progressively improves teaching effectiveness, particularly in areas such as classroom management and inclusive practices that develop over time. This quantitative result is directly reinforced by the qualitative findings under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), where respondents explicitly identified *"experience and teaching background"* and *"prior classroom experience"* as factors that strengthened their baseline performance. As teachers accumulate years of practice, they become more adept at managing the learning environment and addressing diverse learner needs, which explains why Key Result Area 2 showed the clearest advantage among more experienced teachers. Additionally, a teacher respondent from a Small School affirmed the value of accumulated professional support by stating: *"Supportive, industrious, and intelligent school head,"* reflecting how experience combined with consistent leadership contributes to sustained high performance.

Table 8. Significant difference when grouped according to Years in Teaching

Performance Indicators	**Years in Teaching**	$\overline{X}$	**SD**	**T**	**Sig.**
KRA 1: Content Knowledge and Pedagogy	4 to 10 years	1.10	0.08	-1.947	0.056
	More than 10 years	1.14	0.07		
KRA 2: Learning Environment and Diversity of Learners	4 to 10 years	1.06	0.09	-2.612*	0.011
	More than 10 years	1.11	0.09		
KRA 3: Curriculum and Planning	4 to 10 years	0.76	0.05	-1.551	0.126
	More than 10 years	0.78	0.05		
KRA 4: Assessment and Reporting	4 to 10 years	1.10	0.07	-1.691	0.096
	More than 10 years	1.13	0.06		
Plus Factor	4 to 10 years	0.55	0.04	0.408	0.685
	More than 10 years	0.54	0.05		
Overall Rating	4 to 10 years	4.56	0.24	-2.458*	0.017
	More than 10 years	4.70	0.22		

School Category

Table 9. Significant difference when grouped according to School Category

Performance Indicators	**School Type**	$\overline{X}$	**SD**	**F**	**Sig.**
KRA 1: Content Knowledge and Pedagogy	Small to Medium[ab]	1.11	0.07	4.059*	0.022
	Large[a]	1.16	0.08		
	Very Large[b]	1.10	0.07		

Performance Indicators	School Type	$\overline{X}$	SD	F	Sig.
KRA 2: Learning Environment and Diversity of Learners	Small to Medium	1.07	0.08	2.838	0.066
	Large	1.12	0.10		
	Very Large	1.07	0.09		
KRA 3: Curriculum and Planning	Small to Medium[ab]	0.74	0.07	5.394*	0.010
	Large[a]	0.79	0.03		
	Very Large[b]	0.76	0.05		
KRA 4: Assessment and Reporting	Small to Medium	1.09	0.07	2.595	0.083
	Large	1.14	0.07		
	Very Large	1.11	0.06		
Plus Factor	Small to Medium	0.52	0.06	1.302	0.287
	Large	0.55	0.04		
	Very Large	0.54	0.03		
Overall Rating	Small to Medium[a]	4.54	0.17	6.117**	0.004
	Large[b]	4.76	0.26		
	Very Large[a]	4.58	0.21		

Note. Different superscript letters indicate statistically significant differences between school categories based on the post hoc test (p < .05). Means with the same superscript are not significantly different.

The one-way ANOVA results, followed by the Scheffé post hoc test, showed significant differences in Key Result Area 1 (p = 0.022), Key Result Area 3 (p = 0.010), and Overall Rating (p = 0.004) as they all have p-values that is less than 0.05 level of significance. The superscripts indicate that under Key Result Area 1, the post hoc analysis revealed that teachers from Large schools ($\bar{x}$ = 1.16) differed significantly from those in Very Large schools ($\bar{x}$ = 1.10), as indicated by their different superscript letters (*a* and *b*). Meanwhile, teachers from Small to Medium schools ($\bar{x}$ = 1.11), which bear the superscript *ab*, did not differ significantly from either Large or Very Large schools. This indicates that the significant difference in content knowledge and pedagogy was observed only between teachers from Large and Very Large schools with teachers from Large schools obtaining the highest mean score among the three school categories, while teachers from Small to Medium schools demonstrated performance comparable to both groups.

For Key Result Area 3, the post hoc analysis revealed that teachers from Large schools ($\bar{x}$ = 0.79) differed significantly from those in Very Large schools ($\bar{x}$ = 0.76), as indicated by their different superscript letters (a and b). Meanwhile, teachers from Small to Medium schools ($\bar{x}$ = 0.74), which bear the superscript ab, did not differ significantly from either Large or Very Large schools. This indicates that the significant difference in curriculum planning performance was observed only between teachers from Large and Very Large schools, while teachers from Small to Medium schools demonstrated performance comparable to both groups. Teachers from Large schools also obtained the highest mean score ($\bar{x}$ = 0.79), suggesting relatively stronger performance in Curriculum and Planning.

For the Overall Rating, the post hoc analysis revealed that teachers from Large schools ($\bar{x}$ = 4.76) differed significantly from those in Small to Medium schools ($\bar{x}$ = 4.54) and Very Large schools ($\bar{x}$ = 4.58), as indicated by their different superscript letters (b and a). Meanwhile, teachers from Small to Medium and Very Large schools shared the same superscript (a), indicating that their overall performance ratings did not differ significantly from one another. This suggests that the significant difference in overall teacher performance was primarily attributed to teachers from Large schools, while teachers from Small to Medium and Very Large schools exhibited comparable levels of performance.

This pattern strongly aligns with the findings of Lee and Smith (1997), who established that school size directly influences teacher performance and outcomes. According to their research, medium to large schools achieve the highest performance levels because workloads are manageable, resources are adequate, and collaboration thrives without losing personal connections. This explains why Large school teachers in this study consistently recorded the highest ratings, they appear to operate under the most favorable conditions described in the literature: sufficient resources, reasonable enrollment size, and balanced support systems.

In contrast, Small to Medium schools face limitations that may constrain performance. As Lee and Smith (1997) further noted, smaller schools often have fewer course offerings, require teachers to handle multiple subjects or grade levels, and offer limited opportunities for specialized professional growth. This corresponds to the challenges identified under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), where respondents cited *"difficulty aligning topics for multi-grade or multi-area groups*" and *"lack of materials or access to tools"* — conditions that likely contributed to the comparatively lower ratings among Small to Medium school teachers.

Meanwhile, Very Large schools also recorded lower performance compared to Large schools, consistent with Lee and Smith's (1997) observation that very large institutions suffer from bureaucratic complexity, reduced collaboration, and greater teacher isolation despite having abundant resources. This helps explain why Very Large school teachers significantly underperformed their Large school counterparts in Key Result Area 1 and Key Result Area 3. As Kraft and Papay (2014) emphasized, resources alone do not improve performance , what matters is a supportive professional environment characterized by trust, shared leadership, collaboration, and constructive feedback. When schools become too large, these essential elements weaken, making it difficult for teachers to maintain the same level of performance seen in optimally sized schools. This is further illustrated by Teacher 49 from a Very Large School, who noted: *"I can see little difference in my IPCRF rating,"* suggesting that despite project participation, structural challenges inherent in very large schools may limit additional improvements.

Significant Differences in Performance Based on Profile Variables After Project RIPPLES

This section presents the results of the test conducted to determine whether there are significant differences in teacher performance during the implementation of Project RIPPLES when grouped according to the profile variables.

Age

Table 10. Significant difference after implementation when grouped according to Age

Performance Indicators	**Age**	$\overline{X}$	**SD**	**F**	**Sig.**
KRA 1: Content Knowledge and Pedagogy	25 to 35 years old	1.12	0.05	0.443	0.644
	36 to 45 years old	1.13	0.03		
	46 years old and above	1.12	0.04		
KRA 2: Learning Environment and Diversity of Learners	25 to 35 years old	1.10	0.06	1.193	0.314
	36 to 45 years old	1.12	0.03		
	46 years old and above	1.11	0.06		
KRA 3: Curriculum and Planning	25 to 35 years old	0.98	0.04	0.519	0.597
	36 to 45 years old	0.98	0.04		
	46 years old and above	0.99	0.04		
KRA 4: Assessment and Reporting	25 to 35 years old	1.12	0.07	0.454	0.637
	36 to 45 years old	1.10	0.07		
	46 years old and above	1.12	0.06		
Plus Factor	25 to 35 years old	0.25	0.09	0.079	0.924
	36 to 45 years old	0.24	0.06		
	46 years old and above	0.24	0.07		
Overall Rating	25 to 35 years old	4.56	0.14	0.123	0.885
	36 to 45 years old	4.55	0.14		
	46 years old and above	4.57	0.15		

During the implementation period, no significant differences in performance are observed across age groups using one-way analysis of variance (ANOVA). This finding suggests that teachers demonstrated comparable levels of performance during the implementation of Project RIPPLES regardless of age. Specifically, the computed F-values revealed no statistically significant differences across all performance indicators, as evidenced by p-values greater than the 0.05 level of significance. Key Result Area 1 yielded an F-value of 0.443 ($p = 0.644$), Key Result Area 2 obtained $F = 1.193$ ($p = 0.314$), Key Result Area 3 recorded $F = 0.519$ ($p = 0.597$), Key Result Area 4 obtained $F = 0.454$ ($p = 0.637$), the Plus Factor yielded $F = 0.079$ ($p = 0.924$), while the Overall Rating recorded $F = 0.123$ ($p = 0.885$). These findings indicate that teachers performed at relatively similar levels regardless of age during the implementation period.

In terms of mean and standard deviation, some age groups obtained slightly higher mean scores than the others across several performance indicators. However, these differences were minimal, indicating that the average performance of teachers was generally comparable regardless of age. Likewise, the

relatively low standard deviations across all groups suggest that the teachers' performance ratings were closely clustered around their respective means, reflecting consistency in performance within each age group.

This finding supports Pranoto et al. (2021), who emphasized that continuous professional development plays a more critical role in improving teaching competencies than demographic factors such as age. Similarly, Macayanan and Abalos (2023) found that while demographic variables may relate to performance, they do not necessarily produce significant differences when professional support systems are in place. This means Project RIPPLES successfully provided a shared professional development experience that leveled the playing field, all teachers improved comparably because they received the same guidance, LAC sessions, and support regardless of age. The qualitative findings further reinforce this: under Theme 2(Project RIPPLES' Positive Influence on KRA Objectives) and Theme 5 (Overall Perception and Takeaway on RIPPLES' Impact), teachers across all age groups similarly credited LAC sessions, peer collaboration, and new strategies for their growth, confirming that the project's influence, not age, became the primary driver of performance during implementation.

Sex

Table 11. Significant difference after implementation in terms of sex

Performance Indicators	**Sex**	$\overline{X}$	**SD**	**t**	**Sig.**
KRA 1 (Content Knowledge and Pedagogy)	Male	1.12	0.04	0.219	0.828
	Female	1.12	0.04		
KRA 2: Learning Environment and Diversity of Learners	Male	1.11	0.04	0.473	0.638
KRA 2 (Learning Environment and Diversity of Learners)	Female	1.10	0.06		
KRA 3: Curriculum and Planning	Male	1.00	0.03	1.544	0.128
	Female	0.98	0.04		
KRA 3 (Curriculum and Planning)	Male	1.12	0.08	-0.054	0.957
	Female	1.12	0.06		
Plus Factor	Male	0.25	0.08	0.123	0.832
	Female	0.24	0.07		
Overall Rating	Male	4.58	0.14	0.524	0.602
	Female	4.56	0.15		

Using the independent samples t-test, results show no significant differences between male and female teachers across all indicators. Key Result Area 1 ($t = 0.219$, $p = 0.828$), Key Result Area 2 ($t = 0.473$, $p = 0.638$), Key Result Area 3 ($t = 1.544$, $p = 0.128$), Key Result Area 4 ($t = -0.054$, $p = 0.957$), the Plus Factor ($t = 0.123$, $p = 0.832$), and the Overall Rating ($t = 0.524$, $p = 0.602$) all recorded p-values greater than 0.05. Mean scores are nearly identical, both groups scored 1.12 in Key Result Area 1 and Key Result Area 4, while male teachers showed a marginally higher mean in Key Result Area 3 (1.00 vs 0.98) and Overall Rating (4.58 vs 4.56). These differences are numerically negligible and statistically non-significant.

All computed p-values exceed the 0.05 level of significance, indicating that teachers' performance did not significantly differ according to sex across all Key Result Areas, the Plus Factor, and the Overall Rating. The consistently similar mean scores suggest that both male and female science teachers demonstrated comparable levels of competence during the implementation of Project RIPPLES. The project appears to have influenced male and female teachers equally, with no gender-based performance gaps emerging.

This finding is consistent with Alnahdi and Schwab (2023), who highlighted that while differences in teaching attitudes may exist, actual teaching performance and effectiveness are not determined by gender alone. Instead, opportunities for collaboration, reflection, and professional growth are more influential. The thematic findings further reinforce this result. Teachers did not report gender-related differences in their experiences. Instead, respondents commonly attributed improvements to participation in "*LAC sessions", "peer collaboration",* and *"exposure to new teaching strategies"*, as stated under Theme 2 (Project RIPPLES' Positive Influence on KRAs) and Theme 5 (Overall Perception and Takeaway on Project RIPPLES' Impact). Regardless of sex, teachers identified the same project activities as the source of their growth, confirming that Project RIPPLES delivered equitable professional development outcomes.

Years in Teaching

Table 12. Significant difference after implementation in terms of Years in Teaching

Performance Indicators	Years in Teaching	$\overline{X}$	SD	t	Sig.
KRA 1 (Content Knowledge and Pedagogy)	4 to 10 years	1.11	0.05	-1.120	0.269
	More than 10 years	1.13	0.03		
KRA 2: Learning Environment and Diversity of Learners KRA 2 (Learning Environment and Diversity of Learners)	4 to 10 years	1.10	0.05	-1.181	0.242
	More than 10 years	1.11	0.05		
KRA 3: Curriculum and Planning	4 to 10 years	0.97	0.04	-1.462	0.149
	More than 10 years	0.99	0.04		
KRA 3 (Curriculum and Planning)	4 to 10 years	1.11	0.07	-0.816	0.417
	More than 10 years	1.12	0.06		
Plus Factor	4 to 10 years	0.24	0.07	-0.585	0.561
	More than 10 years	0.25	0.08		
Overall Rating	4 to 10 years	4.54	0.15	-1.069	0.289
	More than 10 years	4.58	0.14		

Using the independent samples t-test, results show no statistically significant differences between experience groups across all performance indicators. Key RA 1 (t = -1.120, p = 0.269), KRA 2: Learning Environment and Diversity of Learners (t = -1.181, p = 0.242), KRA 3: Curriculum and Planning (t = -1.462, p = 0.149), KRA 4: Assessment and Reporting (t = -0.816, p = 0.417), the Plus Factor (t = -0.585, p = 0.561), and the Overall Rating (t = -1.069, p = 0.289) all recorded p-values above 0.05. Although teachers with more than 10 years of experience obtained slightly higher mean scores across all indicators than those with 4–10 years of experience, the differences are small and do not reach statistical significance.

While more experienced teachers tended to score marginally higher on average, years of teaching experience was not associated with statistically significant differences in performance during implementation. This means that Project RIPPLES appears to have effectively supported both newer and seasoned teachers, narrowing the performance gap that existed at baseline. The project's professional development influence was strong enough that experience alone no longer created a meaningful difference in outcomes.

This finding is particularly meaningful when compared to baseline, where Key Result Area 2 and Overall Rating showed significant advantages for experienced teachers. The disappearance of those gaps during implementation suggests that Project RIPPLES effectively strengthened the performance of less experienced teachers, bringing them to comparable levels with their more seasoned colleagues. The thematic analysis supports this interpretation: under Theme 2 (Project RIPPLES' Positive Influence on KRAs) and Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), teachers highlighted mentoring, peer collaboration, and shared learning opportunities within LAC sessions as key influences. These collaborative structures enabled less experienced teachers to learn from their colleagues, effectively compensating for fewer years in the profession. This aligns with Pranoto et al. (2021), who noted that continuous professional development can substantially enhance competencies regardless of prior experience.

School Category

Using one-way ANOVA, statistically significant differences were found in Key Result Area 3 (F = 15.580, p < 0.01), Key Result Area 4 (F = 7.436, p = 0.002), and the Overall Rating (F = 12.687, p < 0.01). No significant differences were found in Key Result Area 1 (F = 2.274, p = 0.111), Key Result Area 2 (F = 2.344, p = 0.104), or the Plus Factor (F = 0.153, p = 0.858).

Scheffé post-hoc analysis revealed that in Key Result Area 3, teachers from Large schools^{b} ($\bar{X}$ = 1.01) differed significantly from both Small to Medium schools^{a} ($\bar{X}$ = 0.96) and Very Large schools^{a} ($\bar{X}$ = 0.97). Small to Medium and Very Large schools share the same superscript a, indicating no significant difference between them. In KRA 4, teachers from Large schools^{b} ($\bar{X}$ = 1.15) differed significantly from both Small to Medium schools^{a} ($\bar{X}$ = 1.08) and Very Large schools^{a} ($\bar{X}$ = 1.10). Small to Medium and Very Large schools again showed comparable performance. And in Overall Rating, the analysis showed that teachers from Large schools^{b} ($\bar{X}$ = 4.65) differed significantly from both Small to Medium schools^{a} ($\bar{X}$ = 4.48) and Very Large schools^{a} ($\bar{X}$ = 4.51) while Small to Medium and Very Large schools did not differ significantly from one another. Across all significant indicators, Large school teachers consistently obtained the highest mean scores, with low standard deviations indicating consistent performance within each group.

The post-hoc results clearly show that during Project RIPPLES, teachers from Large schools significantly outperformed all other categories in Curriculum and Planning (KRA 3), Assessment and Reporting (KRA 4), and Overall Rating. Teachers from Small to Medium and Very Large schools performed at comparable levels with no significant difference between them. This pattern reinforces the baseline finding: Large schools provide the most favorable conditions for translating professional development into improved teacher performance. Meanwhile, the absence of significant differences in Key Result Area 1 and Key Result Area 2 suggests that Project RIPPLES positively influenced all school categories equally in content knowledge and learning environment management.

These findings are consistent with Lee and Smith (1997), who established that optimally sized schools achieve the highest performance gains because they balance adequate resources with manageable workloads and strong collaboration. Large schools in this study appear to have exactly that balance, enabling teachers to fully implement improvements in curriculum planning and assessment practices, which are precisely the areas where significant differences emerged. Additionally, Kraft and Papay (2014) argued that supportive school environments enhance teacher effectiveness over time. Teachers from Large schools likely benefited from stronger leadership, better resources, and more consistent implementation support, conditions that allowed them to translate Project RIPPLES activities into measurable performance gains in Key Result Area 3 and Key Result Area 4.

The thematic analysis strongly reinforces this result. Under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), respondents identified *"school support, leadership, and collaboration"* as key factors influencing their performance. Teachers from well-supported environments reported better access to materials, stronger collegial support, and more effective implementation of project activities. Conversely, challenges cited under Theme 4 (Challenges and Limitations of Project RIPPLES), such as *"limited materials, time constraints, and multi-subject workloads*", disproportionately affected Small to Medium and Very Large schools, likely limiting how fully their teachers could implement improvements in curriculum planning and assessment.

Notably, the disappearance of significant differences in Key Result Area 1 and Key Result Area 2 across all school categories suggests that Project RIPPLES successfully narrowed gaps in content knowledge and learning environment management, areas where the project provided direct, consistent support to all teachers regardless of school size. However, differences persisted in Key Result Area 3 and Key Result Area 4 because these Key Result Areas require resources, time, and school-level support that vary by school category.

Table 13. Significant difference after implementation when grouped according to School Category

Performance Indicators	School Type	$\overline{X}$	SD	F	Sig.
KRA 1 (Content Knowledge and Pedagogy)	Small to Medium	1.11	0.04	2.274	0.111
	Large	1.13	0.04		
	Very Large	1.11	0.03		
KRA 2 (Learning Environment and Diversity of Learners)	Small to Medium	1.09	0.07	2.344	0.104
	Large	1.12	0.05		
	Very Large	1.10	0.05		
KRA 3 (Curriculum and Planning)	Small to Medium[a]	0.96	0.03	15.580**	<0.01
	Large[b]	1.01	0.04		
	Very Large[a]	0.97	0.03		
KRA 4 (Assessment and Reporting)	Small to Medium[a]	1.08	0.04	7.436**	0.002
	Large[b]	1.15	0.08		
	Very Large[a]	1.10	0.05		
Plus Factor	Small to Medium	0.25	0.09	0.153	0.858
	Large	0.24	0.07		
	Very Large	0.25	0.07		
Overall Rating	Small to Medium[a]	4.48	0.11	12.687**	<0.01
	Large[b]	4.65	0.13		
	Very Large[a]	4.51	0.12		

Difference in Performance Rating Before and After the Implementation of Project RIPPLES

Based on the analysis, the results revealed that Key Result Area 1: Content Knowledge and Pedagogy exhibited a statistically significant increase from a baseline mean of 0.938 (SD = 0.066) to 0.974 (SD = 0.034) during the implementation of Project RIPPLES. The computed t-value of -4.612 is highly significant at $p < 0.01$. This upward shift in the proportional mean score suggests that teachers demonstrated higher levels of performance in content knowledge and pedagogy during the implementation period. Furthermore, the decrease in standard deviation — from 0.066 at baseline to 0.034 during implementation — indicates that teachers' ratings became more consistent, meaning performance levels converged and became more uniform across all respondents.

This improvement in content knowledge and pedagogy is consistent with Darling-Hammond et al. (2017), who established that effective professional development most directly strengthens teachers' subject-matter knowledge and instructional strategies — precisely the focus of Key Result Area 1. When professional development is content-focused and sustained over time, teachers demonstrate measurable improvements in how they deliver lessons and explain concepts to learners. This finding is further supported by Desimone (2009), who identified content focus as the single most critical characteristic of effective professional development — explaining why Key Result Area 1 showed the clearest and most consistent improvement in this study.

This quantitative result is strongly reinforced by the qualitative responses. Teachers explicitly attributed improvements in their instructional practices to Project RIPPLES. One participant shared, *"Project RIPPLES improved my performance as a teacher as seen in my IPCRF ratings"* (Teacher 01, Small School), while another explained, *"It enhanced my teaching strategies"* (Teacher 04, Medium School). These firsthand accounts align with the project's emphasis on content mastery and pedagogical renewal, confirming that the project's influence was most directly and positively felt in Key Result Area 1 — as highlighted under Theme 2 (Project RIPPLES' Positive Influence on KRA Objectives).

Correspondingly, the Overall Rating recorded a highly significant improvement ($t = -3.590$, $p < 0.01$), rising from a baseline mean of 0.929 to 0.968 during implementation. This holistic improvement demonstrates that Project RIPPLES contributed meaningfully to teachers' collective performance. As Mizell (2015) emphasized, high-quality professional development results in measurable improvements in teacher practice that accumulate over time — exactly the pattern observed here. Several respondents explicitly noted this overall improvement: *"My rating improved to Very Satisfactory to Outstanding (4.5–5.0)"* (Teacher 16, Large School), and *"With the implementation of Project RIPPLES, my ratings improved in all KRAs…"* (Teacher 53, Very Large School). These statements from Theme 1 (Improvement in Teacher Performance and IPCRF Ratings) directly validate the quantitative finding — the project contributed to measurable improvements in overall teacher performance.

In contrast, Key Result Area 2: Learning Environment and Diversity of Learners ($t = 9.789$, $p < 0.01$) and Key Result Area 3: Curriculum and Planning ($t = 2.915$, $p < 0.01$) showed statistically significant decreases in proportional mean scores. This seemingly contradictory pattern, where teachers reported positive project experiences yet scored lower in these areas, is best understood through Guskey's (2002) model of professional development, which explains that changes in beliefs and practices occur BEFORE changes in formal evaluation ratings. Improvements in classroom management, inclusive practices, and curriculum planning take longer to demonstrate measurable results because they require consistent application, adequate resources, and supportive conditions, not just new knowledge.

This explanation is further supported by the challenges identified under Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings) and Theme 4 (Challenges and Limitations of Project RIPPLES). Respondents cited limited instructional materials, time constraints, heavy workload, and internet/ICT limitations as persistent barriers. According to Pranoto et al. (2021), even when teachers acquire new competencies through professional development, resource limitations and contextual constraints can prevent those improvements from being fully reflected in performance ratings. In short: teachers improved their knowledge and intentions through Project RIPPLES, but external constraints prevented those improvements from being fully reflected in their IPCRF ratings for Key Result Area 2 and Key Result Area 3.

Meanwhile, Key Result Area 4: Assessment and Reporting showed no statistically significant change, and the Plus Factor increase was also not statistically significant. These findings are echoed in the interview responses. One participant noted, *"The same ratings in IPCRF however there was great improvement in the learning teaching process"* (Teacher 11, Medium School).

Overall, the paired samples t-test demonstrated that changes in performance were not uniform across all Key Result Areas. This variation is consistent with the findings of Aquino et al. (2023), who reported that LAC-based professional development strengthens different competencies at different rates, content knowledge improves first, while environment, planning, and assessment practices take longer to show measurable results. As reflected in Theme 3 (External Supportive and Challenging Factors Influencing IPCRF Ratings), teacher performance is shaped by multiple influences, school leadership, collegial collaboration, prior experience, and access to professional development beyond Project RIPPLES. Therefore, improvements in IPCRF ratings cannot be attributed to the project alone, nor should temporarily falls in certain KRAs be interpreted as project failure. Rather, Project RIPPLES served as a catalyst for professional growth, while external conditions, resources, time, and support, determined how fully that growth could be measured in formal performance ratings.

Table 14. Difference in Performance Before and After the Implementation of Project RIPPLES

Performance Indicators	Before		After		T	Sig.
	$\overline{X}$	SD	$\overline{X}$	SD		
KRA 1 (Content Knowledge and Pedagogy)	0.938	0.066	0.974	0.034	-4.612**	<0.01
KRA 2 (Learning Environment and Diversity of Learners)	0.908	0.078	0.820	0.039	9.789**	<0.01
KRA 3 (Curriculum and Planning)	0.959	0.064	0.936	0.039	2.915**	<0.01
KRA 4 (Assessment and Reporting)	0.931	0.057	0.930	0.056	0.124	0.902
Plus Factor	0.905	0.076	0.968	0.297	-1.546	0.127
Overall Rating	0.929	0.048	0.968	0.297	3.590**	<0.01

Note: Proportional scaling was used to maintain consistency in the performance indicators despite variations in the IPCRF weights across school years.

Developmental Plan

This section presents the Proposed Development Plan, formulated based on the study's findings, conclusions, and recommendations. It outlines targeted enhancements to Project RIPPLES, specifically addressing the area needing improvement identified in Key Result Area 2 (Learning Environment and Diversity of Learners). This plan proposes improvements to the project's existing activities so that Project RIPPLES may more effectively support teachers in strengthening their competencies in this area.

As revealed in the study, statistically significant improvements were observed in Key Result Area 1 and the Overall Rating during Project RIPPLES, showing a positive association between project participation and strengthened performance. However, Key Result Area 2 remained at the Very Satisfactory level and recorded a significant decrease in mean scores. This indicates that while the project strengthened content knowledge and pedagogy, it provided insufficient focus and resources for inclusive classroom management and learner support — the specific competencies under Key Result Area 2. Interviews further confirmed that large class sizes, diverse learner needs, time constraints, and limited materials limited improvements in this area.

Therefore, this Development Plan proposes enhancements to Project RIPPLES, integrating new focus areas, mentoring, and resource development into its regular LAC sessions. By prioritizing Key Result Area 2, the plan aims to make the project more balanced and effective in helping teachers achieve Outstanding performance across all Key Result Areas.

Table 15. Proposed Development Plan

Focus Area	**Development Need**	**Objective**	**Proposed Intervention**	**Timeline**	**Persons Involved**	**Resources Needed**	**Success Indicator**
KRA 2: Learning Environment and Diversity of Learners	Strengthen competence in inclusive classroom management, differentiated instruction, and learner support	To enhance Project RIPPLES activities by adding targeted support that improves teachers' skills in managing diverse learners and creating	**Enhanced LAC Sessions** Integrate sessions on inclusive education, differentiated instruction, and learner diversity into regular Project RIPPLES schedules	Whole School Year	District Office Officials, School Heads, Master Teachers, Science Coordinators/LAC Facilitators, Science Teachers, SPED Coordinator	Training guides, inclusive education references, classroom observation rubrics, material development templates	•Increased Outstanding ratings in Key Result Area 2 in IPCRF •Improved classroom observation scores in inclusive

Focus Area	**Development Need**	**Objective**	**Proposed Intervention**	**Timeline**	**Persons Involved**	**Resources Needed**	**Success Indicator**
		inclusive learning environments	**Mentoring & Classroom Observation** Add observation and feedback on inclusive teaching practices as part of regular project monitoring **Resource Development** Guide teachers in creating and sharing contextualized, inclusive learning materials as part of project outputs				practice indicators •Inclusive education components integrated into regular Project RIPPLES activities

4. CONCLUSION

The findings of the study revealed that Junior High School science teachers in the Northern District of SDO Nueva Vizcaya demonstrated an already outstanding level of performance across all Key Result Areas (KRAs) prior to the implementation of Project RIPPLES, with KRA 2 (Learning Environment and Diversity of Learners) the only area predominantly rated Very Satisfactory. During implementation, teachers sustained their high professional standards; KRA 1 (Content Knowledge and Pedagogy) and the Overall Rating improved significantly, confirming the project's strength in advancing instructional and content mastery, while KRA 2 and KRA 3 (Curriculum and Planning) recorded lower proportional mean scores, indicating areas constrained by resources, time, and workload. Comparatively, performance did not differ by age or sex at either stage; experience-based gaps evident before implementation disappeared during the program, showing Project RIPPLES effectively supported newer teachers through collaborative learning, though school category remained a persistent influence — teachers from Large schools consistently outperformed those from Small/Medium and Very Large schools across several indicators. Qualitative insights further revealed that while Project RIPPLES contributed to professional growth, outcomes were shaped by a broader set of factors including school leadership, collegial mentoring, material availability, and prior experience, meaning observed changes cannot be attributed to the project alone. Collectively, the study suggests that a division-wide LAC initiative can strengthen core teaching competencies and equalize performance across career stages, yet improvements remain uneven across domains, and structural school-level differences continue to mediate professional development impact even in supportive contexts.

5. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed to strengthen Project RIPPLES, enhance science teacher performance, and guide future research:

1. Sustain and expand Project RIPPLES with targeted sessions focused on KRA 2 and KRA 3 — specifically inclusive teaching practices, differentiated instruction, and resource-efficient curriculum planning — through classroom-based coaching, material development workshops, and sharing of best practices.
2. Provide equitable access to instructional resources, mentoring, and professional support across all school categories, prioritizing Small/Medium and Very Large schools to reduce persistent performance gaps and ensure all teachers benefit equally from division-wide initiatives.
3. Strengthen monitoring and feedback mechanisms to track practice-based improvements in KRA 2 beyond formal ratings, using classroom observation and formative review to capture growth that may not yet be reflected in year-end assessments.

4. Encourage science teachers to actively lead and participate in peer collaboration, reflective practice, and cross-school mentoring networks to further embed inclusive strategies and context-responsive planning into daily instruction.

5. Guide future researchers to conduct longitudinal or multi-division studies, incorporate additional variables such as resource adequacy and leadership style, and explore student-level outcomes to provide a more comprehensive understanding of how professional development programs translate into improved learning results.

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