

Science Teachers' Research Orientation towards Teaching Practices and Students' Learning

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Abstract

This study investigates the correlation between teachers' profiles and their research orientation on teaching practices and student learning outcomes. It aims to explore demographic profiles of the teachers, assess the level of research orientation among science teachers, evaluated teachers' teaching practices, and student learning levels. By examining these, it sought to answer relationship between teachers' profile; teaching practices; students learning, relationship between research orientation to teaching practices and students learning. It is also, uncover insights into how teachers' backgrounds and research orientations influence their instructional methods and its relation to student learning outcomes in the science curriculum.

The study adopted the concurrent mixed method design. To gather essential data, a researcher-designed questionnaire served as the primary tool used to administer 64 science teachers from the Division of Laguna, District of Sta. Cruz, serving as respondents. Statistical analyses included calculating the mean, standard deviation, and Pearson correlation coefficient to assess hypotheses. While thematic analysis was performed to generate conclusion out of participant's responses.

From the study's data analysis, it was found that the majority of respondents fell within the age range of 26 to 35 years old, female-married teachers who are specialized in biological science and serving the education institution from 7 to 10 years. Additionally, it was revealed that teachers high obtained very high research orientation. Also, it is indicated that teachers excelled in teaching practice reflecting their ability to adapt approaches to meet diverse student needs through exposure to varied research activities. Moreover, it is evident that learners obtained very high performance in their level of understanding and retention, information literacy, attitude towards learning, self-efficacy and learning and engagement and participation. Teacher's profile was observed to have relationship to teaching practices as teachers teaching sciences and experiences in the field of teaching with ancillary loads aided teachers to develop different strategies in dealing students' needs. Moreover, teachers' profile also played significant predictors in students' learning thus signified that teacher's development improved student's learning experiences as they were able to craft different methods that captured students' interest in complex idea simplified with innovative approach.

Research orientation was observed to influence students learning thus signified rejection of the null hypothesis. Teacher's initiative in attending research related seminar and exchange of idea leaded them to their growth in the profession as they were able to perceived solutions in problems encountered in curriculum delivery and assessment through innovative strategies. Also, teachers' orientation affected the development of students' learning thus signified rejection of null hypothesis as the teachers' willingness to attend seminars and related activities to improve their professional knowledge in conducting action research aided the student's interest and learning experiences in sciences.

Based on the findings and conclusions made, the school can tailor inclusive training for diverse teachers, foster a research culture, offer incentives for teacher research, and adapt based on factors affecting research involvement.

Keywords: Learning Outcomes, Learning experiences, Teachers Initiative

1. Introduction

The competitive nature of the education system relied much on research methodologies. This spurred innovation among policymakers and those who were responsible for implementing curricula to craft the implementation practices and shaping trends in education. Hence, education adopted the competencies required for the graduates and developed students' capabilities through creative and innovative teaching practices which were evaluated and validated through research.

As globalization and technological integration transform educational norms, rapid shifts occur within the field. This includes research-based innovation in teaching practices to refine policies, enhance curriculum delivery for learners and elevate the quality of instruction (Tomaro, 2018).

Today, teachers are increasingly urged to produce professional-level research outcomes as per DepEd Memorandum 114 series of 2014. This directive mandates teachers to undertake action research or assessments in their subject domains. Notably, the school-based Action Research (SBAR) movement convenes annually underscoring the significance of this initiative.

Action research emerges as a primary research activity imposed by the Department of Education among teachers. It involves investigating the problems encountered in educational institutions and analyzing organizations' practices in dealing with challenges. This method provides teachers with an organized set of information to guide them in decision-making, in crafting effective alternative solutions to enhance program implementation, and sustain high-quality school operations (Codina & Robinson, 2024). Consequently, educators are empowered to swiftly and efficiently devise practical solutions to address these issues.

The Department of Education (DepEd) utilized action research to process systematic innovation in the teaching and learning practices while addressing operational challenges among schools that include facilities and practices. (DepEd Order No. 16 s. 2017). In recent years, numerous teachers have been involved in research activities within their respective schools aligning with their professional development and promotional requirements to specific positions. Due to the paradigm shift in education delivery, teachers are engaged in research procedures; hence, this engagement equips them with the necessary tools to test innovations, bridge learning gaps among students and ensure the effective delivery of the curriculum, ultimately fostering academic success.

But admittedly, most of the teachers in the District of Sta Cruz Division of Laguna have not engaged in research activities in recent years. Despite the requirement imposed by DepEd for promotion and annual performance evaluation, many hesitate to undertake the task of crafting their action research. Hence, this paper aims to know the underlying reasons behind this reluctance and assess the challenges, needs, and motivations experienced by teachers concerning action research. Furthermore, it seeks to explore the correlation between teachers' engagement in action research and its impact on students' learning outcomes and the enhancement of teaching practices, particularly among secondary science educators in Santa Cruz District, Schools Division of Laguna.

Identifying the barriers hindering teachers from conducting action research is crucial to understanding how school administrations can offer support and facilitate the upskilling of educators. By addressing these challenges and providing the necessary resources and guidance, schools can empower teachers to enhance the quality of education and cultivate a culture of research-oriented practices. Ultimately fostering teachers' self-esteem and confidence in their research abilities is paramount, as it is likely to contribute to the overall success in improving educational outcomes.

1.1 Statement of the Problem

This study investigated on the following questions:

1. What is the demographic profile of teachers in terms of.
 - 1.1 age;
 - 1.2 sex;

- 1.3 civil status;
- 1.4 number of years in service;
- 1.5 number of conducted action research; and
- 1.6 position?
2. What is the status of teachers' research orientation in terms of:
 - 2.1 seminar attended;
 - 2.2 research engagement;
 - 2.3 Peer Coaching; and
 - 2.4 personal growth?
3. What is the level of teachers' teaching practices in terms of:
 - 3.1 mastery learning;
 - 3.2 assessment feedback;
 - 3.3 lecture presentation; and
 - 3.4 use of appropriate material?
4. What is the level of student's learning in terms of:
 - 4.1 knowledge retention;
 - 4.2 information literacy;
 - 4.3 attitude Towards Learning;
 - 4.4 self-efficacy & learning; and
 - 4.5 engagement and participation?
5. Is there a significant relationship between the teachers' profile on teaching practices and students' learning?
6. Is there a significant relationship between research orientation to teaching practices and students' learning?

2. Methodology

The research design used in this study was a concurrent mixed-method design. The researcher simultaneously observed the research problem with quantitative and qualitative data and merged the data to integrate information interpretation.

This research design was appropriate for this study because this paper aimed to draw valid conclusions between science teachers' research orientation, teaching practices, and students' learning outcomes. The research design was also appropriate in drawing valid conclusions on the level of the findings between science teachers' research orientation, teaching practices, and students' learning outcomes.

3. Results and Discussion

This chapter outlines various outcomes and analyzes the findings obtained from analyzing the data collected in this research. It delves into the impacts of adopting an action research approach on both teaching practices and students' learning.

Demographic Profile of Teachers

Within the investigation, the level of teachers' demographic profiles pertains to their background information, including factors such as age, sex, civil status, undergraduate specialization, number of years in service, number of conducted action research, and professional position.

The following table reveals teacher's demographic profile, which shows the frequency and percentage of the population that includes verbal interpretation.

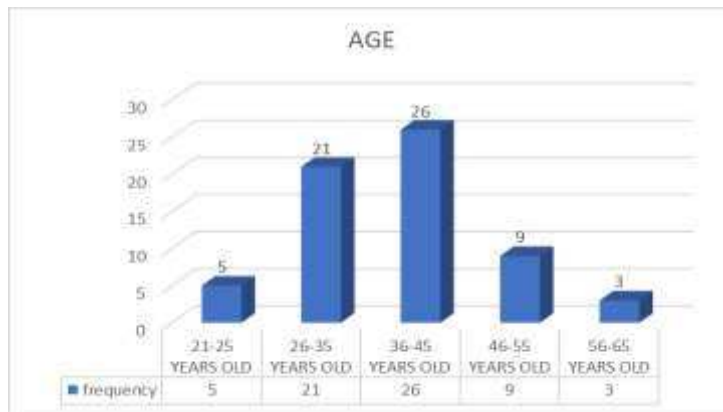


Figure 1 Demographic Profile of Teachers in Terms of Age

Out of the sixty-four respondents, the ages “36 to 45” received the highest frequency, twenty-six (26) of the total population. They were followed by the ages “26 to 35,” with twenty-one (21) respondents. The ages “56 to 65” received the lowest frequency, three (3) of the total population.

The study indicated that the majority of participants were adults. While time serves as a measure of an individual’s lifespan, it is also intertwined with the accumulation of life experiences that can influence professional practices, especially in terms of decision-making skills and perspectives.

These topics include whether aging is a disease that needs to be treated, whether it is better to be significantly older, and whether it is better to be older.

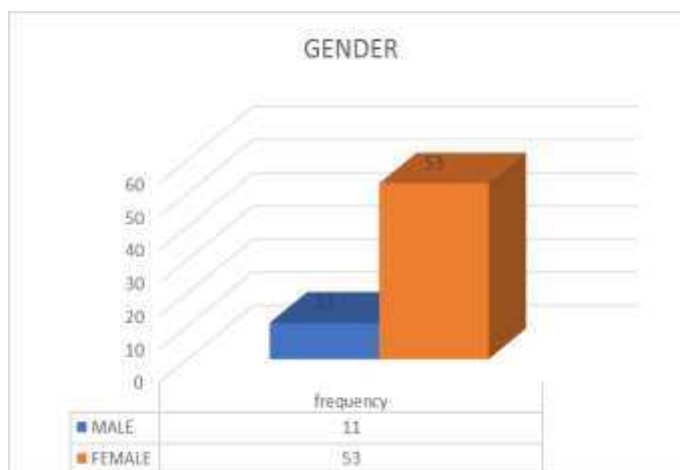


Figure 2 Demographic Profile of Teachers in Terms of Sex

Figure 2 presents the demographic profile of teachers in terms of sex. Out of sixty-four respondents, the female received the highest frequency of twenty-six (53) of the total population compared to its counterpart with twenty-one (11) respondents.

The study revealed that majority of the participants were female, influencing their habits in research and communication. It suggested that women were more commonly involved in research endeavors, often demonstrating a greater concern for the quality and substance of written ideas. This indicates a higher level of

engagement in research activities among female educators.

This suggests that the cultural context in which research is conducted and communicated influences its reception and perceived value within the academic community. Overall, the findings shed light on the complex interplay between gender, writing styles, and cultural factors in shaping academic discourse and impact within the marketing discipline.

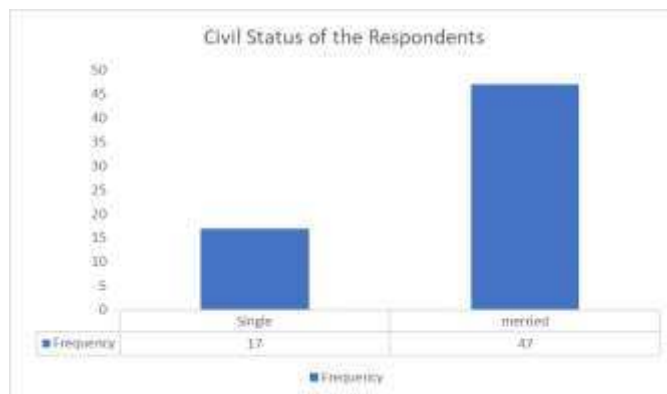


Figure 3 Demographic Profile of Teachers in Terms of Civil Status

Figure 3 presents the demographic profile of teachers in terms of civil status. Out of sixty-four respondents, married couples received the highest frequency of forty-seven (47) of the total population compared to their counterparts, who had seventeen (17) respondents.

The study revealed that a majority of the participants were married, potentially influencing their readiness to engage in the research activity due to additional responsibilities such as managing household duties and caring for children. This suggests that most of the teachers involved in the research were married and displayed a willingness to embrace new concepts despite perceived additional obligations.

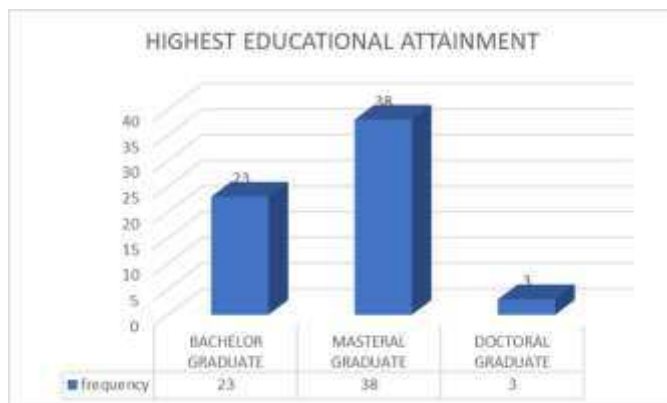


Figure 4 Demographic Profile of Teachers in Terms of Highest Educational Attainment

Figure 4 presents the demographic profile of teachers in terms of educational attainment. Out of the total number of sixty-four respondents, most of the teachers in Santa Cruz were master's graduates, with 38 respondents from the population. This was followed by 23 respondents who obtained their bachelor's degree and three who obtained their doctor's degree.

The table indicates that the majority of teachers who participated in research activities for professional development had completed graduate study programs. They undertook comprehensive studies focusing on research strategies tailored to their various areas of specialization.



Figure 5 Demographic Profile of Teachers in Terms of Number of Years in Service

Figure 5 presents the demographic profile of teachers in terms of years in service. The table shows that most teachers who participated in research activities served the Department of Education for 7 to 10 years, with 19 respondents out of 64. Teachers who served the Department of Education for 11 to 13 years and from 20 to 22 obtained the least number of teachers who participated in research activities, with three respondents from the population.

It is evident that teachers with fewer years of service in the Department of Education are more inclined to participate in research activities, likely because they are still acquainted with research practices. Newly hired teachers frequently attend research seminars and activities, reflecting the organization's culture of nurturing young professionals, who are perceived to benefit more from such opportunities compared to those with a greater number of years in the field.

Additionally, the study highlights the influence of personality traits, such as neuroticism, on career involvement. Moreover, the research points to the potential impact of cultural disparities on the effectiveness of personal development programs. In light of these findings, it is imperative for educational institutions to tailor professional education initiatives to accommodate students' diverse interests and personality traits, thereby fostering a more conducive environment for career development and engagement.

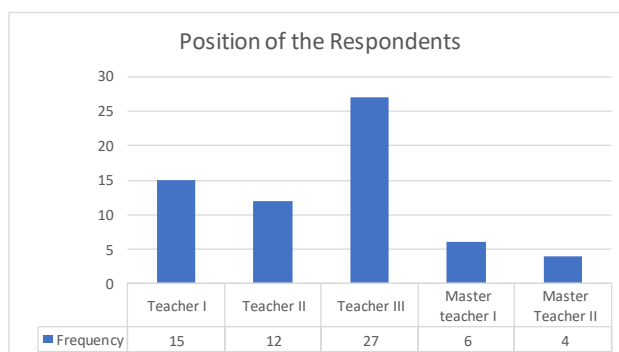


Figure 6 Demographic Profile of Teachers in Terms of Position of the Respondents

Figure 6 presents the demographic profile of teachers in terms of position. The table shows that most teachers who participated in research activities were teacher III, with 27 respondents out of 64. 15 out of 64

respondents are considered teacher one, while the fewest were master teacher 2, with only two respondents out of 64.

The depiction presented in the figure underscores the prevalence of teachers holding positions of authority, particularly those attaining the esteemed academic ranks of teacher three and teacher 1. Notably, individuals entering the field with a bachelor's degree typically commence their careers at the teacher 1 level. In contrast, those with master's degrees often ascend to the revered status of teacher III. This hierarchical structure underscores the influence of promotional prospects on individuals' propensity to engage actively in ancillary services. Many perceive the reclassification of positions as rewarding and acknowledging their accomplishments, fostering tremendous enthusiasm and dedication to supplementary roles within the academic realm.

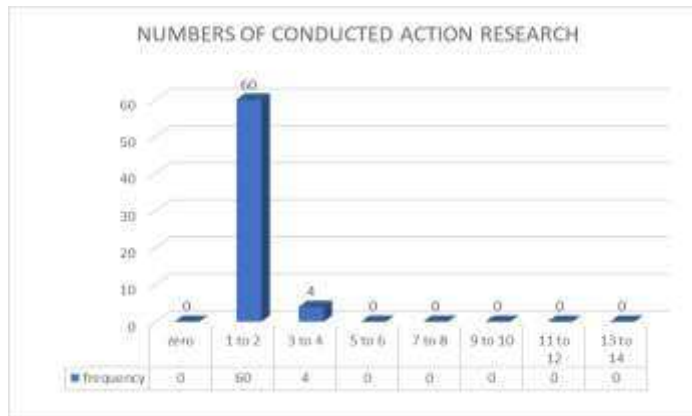


Figure 7 Demographic Profile of Teachers in Terms of Number of Conducted Action Research

Figure 7 presents the demographic profile of teachers in terms of number of conducted action research. It can be gleaned from the table that most teachers produce 1 to 2 action research throughout their stay in the Department of Education, having 60 out of 64 respondents.

Only four respondents managed to produce 3 to 4 action research on the practice of the teaching profession in public intuition, while the rest remained zero.

It appears that teachers in public institutions have generated a limited amount of action research, primarily because it is mandated only for master teachers and head teachers as part of their annual requirements in the Individual Performance Commitment and Review Form (IPCRF). However, others may undertake such research voluntarily to address perceived classroom challenges and experiment with different teaching approaches, aiming to enhance their instructional practices.

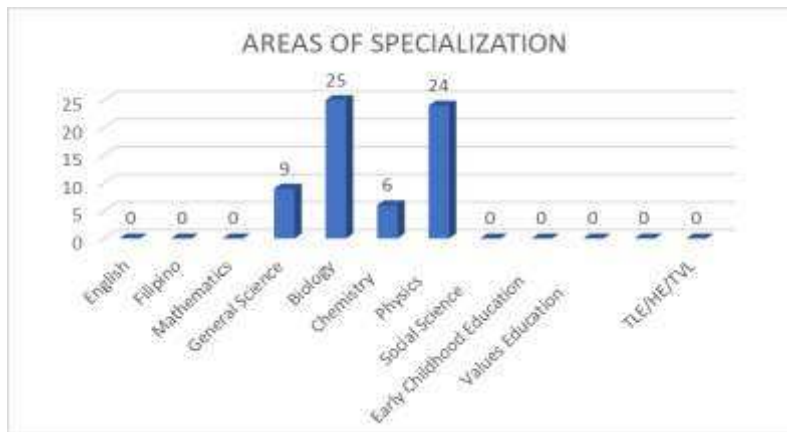


Figure 8 Demographic Profile of Teachers in Terms of Areas of Specialization

Figure 8 presents the demographic profile of teachers in terms of Areas of specialization. It can be gleaned from the table that most teachers who specialized in biology engaged in research activities with 25 out of 64 respondents. It was followed by teachers specializing in physics, with 24 out of 64 teachers. Non-science-related specialization obtained the lowest number of action research involvement, having 0 out of 64 respondents.

The survey results show that all of the teachers who responded to the task of engaging in action research specialized in science among different disciplines due to the nature of their subject, which focuses on experimentation and research. They practice collaboration by finding and sharing expertise in the research cycle for their professional development initiative, hence, allow them to produce research outputs.

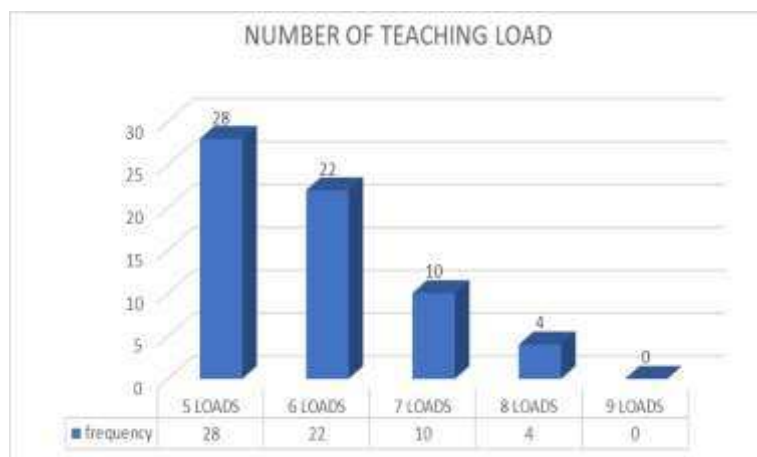


Figure 9 Demographic Profile of Teachers in Terms of Number of Teaching Load

Figure 9 presents the demographic profile of teachers in terms of workload. It can be gleaned from the table that most teachers who had five workloads were actively involved in research activities, having 28 out of 64 respondents. Meanwhile, no teacher in the Department of Education participated in the research activities and had a nine workload, which landed to be the least on the table, having one out of 64 respondents.

In this study, the status of teachers' research orientation refers to seminars attended, research engagement, peer coaching, and personal growth.

Status of Teachers' Research Orientation

Table 1 Status Of Teachers' Research Orientation in Terms of Seminar Attended

Statements	Mean	SD	Remarks
<i>The seminars I attended provided valuable insights and knowledge relevant to my action research project.</i>	3.39	0.49	Strongly Agree
<i>The seminars I attended enhanced my understanding of action research methodologies and techniques.</i>	3.39	0.49	Strongly Agree
<i>I applied specific concepts or techniques learned in the seminars to my action research project.</i>	3.41	0.53	Strongly Agree
<i>Seminars attended helped me refine the research questions or objectives of my action research.</i>	3.45	0.50	Agree
<i>Due to the seminars, I established a better research design or methodology for my action research project.</i>	3.39	0.52	Strongly Agree
Weighted Mean	3.41		
SD	0.44		
Verbal Interpretation	Very High		

Table 1 illustrates teachers' research orientation status in terms of seminars attended. The teachers research orientation in terms of workshops obtained very high ($M=3.41$, $SD=0.44$) which entailed that those teachers had their research exposure and adaptation of practices through their varied attendance in different seminars related to action research provided by the Department of Education or provided institution.

Teachers strongly agree ($M=3.45$, $SD=0.50$) that "seminars attended help them to refine the research questions or objectives of their action research". This entailed that teachers develop their skills in crafting objectives and research questions on chosen topics aligned with their area of specialization upon attending training programs imposed by the Department of Education.

Furthermore, despite being ranked lowest among the indicators, it is noteworthy that teachers expressed strong agreement ($M=3.39$ and standard deviation of 0.49) regarding the value derived from the seminars they attended. They emphasized the seminars' role in providing valuable insights and knowledge pertinent to the action research project.

Moreover, the teachers emphasized the significant impact of these seminars on their professional growth. They underscored how participation in these sessions deepened their comprehension of action research methodologies and techniques, equipping them with invaluable tools for conducting research effectively.

As a result, they reported a heightened ability to formulate a more comprehensive and robust research design or methodology explicitly tailored to the requirements of their action research projects. This enhanced understanding and empowered them to navigate the complexities of the research process with greater confidence and fostered a sense of assurance in the validity and reliability of their research outcomes.

This denoted that teachers obtained their understanding of the action research procedure, methodologies to be used, and better research design aligned to the research question and goal through exposure to different seminars, as they had the opportunity to ask questions of experts and exchange ideas among best practices of action research implementation.

Table 2 Status of Teachers' Research Orientation in Terms of Research Engagement

Statements	Mean	SD	Remarks
<i>Due to my research engagement, I adopted a more effective research design or methodology for my action research.</i>	3.28	0.49	Strongly Agree
<i>I formulated more focused research questions or objectives for my action research project.</i>	3.20	0.44	Agree
<i>I have applied specific research skills or knowledge gained from engagement in research to my action research project.</i>	3.36	0.55	Strongly Agree
<i>My engagement in research activities has positively influenced my ability to conduct action research.</i>	3.39	0.55	Strongly Agree
<i>I obtained new techniques on how my action research would become attainable.</i>	3.38	0.52	Strongly Agree
Weighted Mean	3.32		
SD	0.42		
Verbal Interpretation	Very High		

Table 2 illustrates teachers' research orientation status in terms of research engagement. The teachers obtained research orientation in terms of research engagement were very high ($M=3.32$, $SD=0.42$) which showed that teacher had their knowledge in developing action research upon hands-on experience concerning specialization and different methodologies that fit on the perceived problem of their respective school.

The table shows that teachers strongly agree ($M=3.39$, $SD=0.55$) that their engagement in research activities has positively influenced their ability to conduct action research. This entailed those teachers, upon exposure to research activities, obtained different knowledge and competencies in performing and writing research as they had hands-on experiences and perceived different challenges in the process, which they may apply upon writing their action research in their respective schools.

Meanwhile, although least among the indicators, the teachers agree ($M=3.20$, $SD=0.44$) that they formulated more focused research questions or objectives for their action research project. This indicates that teachers are confident in their knowledge and ability to construct research questions aligned with the objectives of their action research based on perception of the problems inside the school and experience in research activities.

Table 3 Status of Teachers' Research Orientation in Terms of Peer Coaching

Statements	Mean	SD	Remarks
<i>Peer coaching helped me achieve my action research goals</i>	3.52	0.50	Strongly Agree
<i>Peer coaching sessions provide valuable insights into the research process.</i>	3.53	0.53	Strongly Agree
<i>I was satisfied with the peer coaching support I received during my action research project.</i>	3.39	0.49	Strongly Agree
<i>Peer coaching helped me acquire new research skills or knowledge to craft my action research.</i>	3.45	0.53	Strongly Agree
<i>I communicated my research ideas more effectively with the help of peer coaching.</i>	3.44	0.50	Strongly Agree
Weighted Mean	3.47		
SD	0.43		

Verbal Interpretation**Very High**

Table 3 illustrates teachers' research orientation status in terms of peer coaching. The teachers' research orientation in terms of peer coaching obtained very high ($M=3.47$, $SD=0.43$) which emphasized that teachers had their knowledge in developing action research upon instruction and guidance among members of the education institution who had experience in developing action research or those who had the expertise in research procedures and publication as they obtain insights on the proper way of designing the study and accomplishing the paper for publication.

This suggests that teachers frequently gain from having a great deal of experience doing action research projects. This process is further enhanced when educators receive training and assistance, especially from more seasoned colleagues at the same institution. By working together, educators gain important knowledge about many facets of study design and publication procedures. They get a better comprehension of efficient procedures, data analysis strategies, and academic writing methods as they interact with their peers and mentors. They get the information and abilities needed to undertake, finish, and publish research papers in their disciplines as a result of this experience. Moreover, educators who actively engage in this cycle of continuous learning not only improve their own research skills but also add to the body of knowledge.

It is evident from the table that teachers strongly agree ($M=3.53$, $SD=0.53$) that peer coaching sessions provide valuable insights into the action research process. This denoted that teachers highly value the importance of the peer coaching program conducted by the school to capacitate every member of the faculty with the necessary skills in designing and writing their action research aligned to their specialization, problems encountered in teaching, and their proposed solution that may affect learning among students.

Also, the teachers strongly agree ($M=3.39$, $SD=0.49$) that they are satisfied with the peer coaching support they received during action research project. This denotes that teacher in the public institutions received appropriate support from their colleagues who had expertise in developing action research while writing research aligned with their research interests and objectives.

Peer tutoring is participatory, it helps tutors gain a thorough grasp of the tutee's mental state and comprehension of the material. Successful results frequently result from meaningful actions between tutors and tutees within of a defined program. This cooperative method actively involves both individuals in the learning process, which improves understanding and retention. In the end, peer tutoring enhances teaching skills and promotes a fulfilling learning environment for both the tutee and the tutor.

Table 4 Status of Teachers' Research Orientation in Terms of Personal Growth

STATEMENTS	MEAN	SD	REMARKS
<i>I reflect on my teaching practices to identify areas for improvement.</i>	3.48	0.50	Strongly Agree
<i>I am open to feedback from colleagues and supervisors.</i>	3.61	0.49	Strongly Agree
<i>I set specific goals for my personal and professional growth.</i>	3.55	0.50	Strongly Agree
<i>I engage in activities outside of my comfort zone to expand my skills.</i>	3.42	0.50	Strongly Agree
<i>I actively participate in workshops, seminars, or conferences related to education and Action Research.</i>	3.36	0.55	Strongly Agree
Weighted Mean	3.48		
SD	0.43		
Verbal Interpretation	Very High		

Table 4 illustrates teachers' research orientation status in terms of personal growth.

The teachers research orientation in terms of personal growth obtained very high ($M=3.48$, $SD=0.43$) on, which denoted that teachers had the aim of engaging in different research activities outside their comfort zone to develop skills and strategies for teaching and research based on the perceived problems, solutions, and feedback from co-teachers in the institution.

The table shows that teachers strongly agree ($M=3.61$, $SD= 0.49$) that they are open to feedback from colleagues and supervisors. This implies that the teachers are willing to accept constructive criticism from faculty members who have experience in developing action research to enhance their competency in research activities, and knowledge in teaching, which will lead to personal growth.

In addition, teachers strongly agree ($M=3.42$, $SD=0.50$) that they engage in activities outside their comfort zone to expand their skills. This entailed that the teachers are willing to participate in different research activities outside of what they already know and experience to gain additional skills that will aid them in enhancing research skills that will lead to professional development.

Level of Teachers' Teaching Practices

Table 5 *Level of Teachers' Teaching Practices in Terms of Mastery Learning*

Statements	Mean	SD	Remarks
<i>I clearly understand the learning objectives for each unit or lesson.</i>	3.64	0.48	Strongly Agree
<i>I design assessments that align with the specific learning objectives.</i>	3.53	0.53	Strongly Agree
<i>I keep track of individual students' progress toward mastery of learning objectives.</i>	3.52	0.50	Strongly Agree
<i>I provide additional support or resources to students struggling to master the content.</i>	3.52	0.50	Strongly Agree
<i>I encourage students to self-assess their understanding of the material.</i>	3.58	0.50	Strongly Agree
Weighted Mean	3.56		
SD	0.42		
Verbal Interpretation	Very High		

Table 5 illustrates the level of teachers' teaching practices in terms of mastery learning. The teachers' level of teaching practices in terms of mastery learning obtained a very high ($M=3.56$, $SD=0.42$) which showed that teachers were highly competent in different strategies and methodologies for addressing student difficulty and delivering curriculum content that responds to student needs.

The table showed evident results that teachers strongly agree ($M=3.64$, $SD=0.48$) that they clearly understand the learning objectives for each unit lesson. This indicates that teachers ensure their understanding of the learning competencies in each topic, and that the teaching methods are aligned to ensure the attainment of learning goals during the teaching and learning process.

Moreover, teachers strongly agree ($M=3.52$, $SD=0.50$) that they should keep track of individual students' progress toward mastery of learning objectives and provide additional support to students struggling to master the content. Teachers often practice keeping records of every student in the class as the basis for identifying the level of mastery and assisting those learners who encounter difficulty in reaching the said level.

Table 6 *Level of Teachers' Teaching Practices in Terms of Assessment Feedback*

Statements	Mean	SD	Remarks
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<i>I was able to assess the content covered in the unit lesson accurately.</i>	3.48	0.50	Strongly Agree
<i>I provided an assessment that was fair and unbiased.</i>	3.53	0.50	Strongly Agree
<i>I was able to monitor and understand my assessment performance.</i>	3.50	0.50	Strongly Agree
<i>I provide assessment feedback in a timely and relative manner.</i>	3.39	0.49	Strongly Agree
<i>The assessment feedback identified different areas in teaching and learning that need improvement.</i>	3.41	0.50	Strongly Agree
Weighted Mean	3.46		
SD	0.42		
Verbal Interpretation	Very High		

Table 6 illustrated the level of teacher teaching practices in terms of assessment feedback. It is evident that the teachers' level of teaching practices in terms of assessment feedback obtained a very high ($M=3.46$, $SD=0.42$) which indicated that teachers highly practice the feedback system every after-assessment to guide learners in improving their performance in a particular topic and subject.

The table shows that teachers strongly agree ($M=3.53$, $SD=0.50$) that they practice providing a fair and unbiased assessment. This indicates that the teachers provide a varied assessment strategy that evaluates the mastery of students' competency without bias and maintains fairness among class members.

Moreover, the teachers also strongly agree ($M=3.39$, $SD=0.49$) that they provide assessment feedback in a timely and relative manner. This entailed that the teachers often offered comments and suggestions to improve and enhance student's performance, and clarify room for improvement in every evaluation.

Table 7 Level of Teachers' Teaching Practices in Terms of Lecture Presentation

Statements	Mean	SD	Remarks
<i>I was effective in using lecture presentations to convey information.</i>	3.48	0.50	Strongly Agree
<i>I was able to craft lecture presentations that were engaging and interactive.</i>	3.50	0.53	Strongly Agree
<i>My lecture presentations are well-organized and easy to follow.</i>	3.53	0.53	Strongly Agree
<i>I incorporate multimedia elements in my presentations.</i>	3.52	0.50	Strongly Agree
<i>I encourage questions and discussions during lectures.</i>	3.56	0.50	Strongly Agree
Weighted Mean	3.52		
SD	0.45		
Verbal Interpretation	Very High		

Table 7 illustrates the level of teacher teaching practices in terms of lecture presentation. It is evident that the teachers' levels of teaching practices in terms of lecture presentation obtained very high ($M=3.52$, $SD=0.45$) which revealed that teachers practice crafting lesson content in an organized manner that boosts students' understanding and facilitates interactive discussion of the topic.

The table shows that teachers strongly agree ($M=3.56$, $SD=0.50$) on their practice of encouraging questions and discussion during lectures. This explains that teachers allow the learners to provide processing questions regarding the topic and encourage students to actively participate in the discussion by sharing insights.

Moreover, the teachers strongly agree ($M=3.48$, $SD=0.50$) on their practice of using lecture presentations to convey information. This denotes that the teachers are confident in their ability to deliver the lesson content through lecture discussion so that the students master the lesson content.

This emphasizes the common use of lecture presentations in teaching, highlighting the crucial role of the connection between presenter and audience. It emphasizes dynamic teaching, promoting direct engagement with learners, and stresses linguistic precision, time management, and entertainment to improve knowledge transmission.

Level of Teachers' Teaching Practices in Terms of Use of Appropriate Material

Table 8 *Level of Teachers' Teaching Practices in Terms of Use of Appropriate Material*

STATEMENTS	MEAN	SD	REMARKS
<i>I was effective in using lecture presentations to convey information.</i>	3.61	0.49	Strongly Agree
<i>I use materials that enhance my understanding of my students in the subject.</i>	3.61	0.49	Strongly Agree
<i>I select materials that are relevant and engaging.</i>	3.67	0.47	Strongly Agree
<i>I use materials that are up-to-date and accurate.</i>	3.64	0.48	Strongly Agree
<i>I adapt materials to meet the diverse needs of students.</i>	3.63	0.49	Strongly Agree
Weighted Mean	3.63		
SD	0.41		
Verbal Interpretation	Very High		

Table 8 emphasizes the teacher's practices in teaching the focus on the ability to used materials aligned to the objectives of the lesson, availability, student's level of understanding and type of the lesson provided to assist them in clarification of core concepts in science subject.

Table 8 described the level of teachers' teaching practices in terms of using appropriate materials. It is evident that the teachers Level Of Teachers' Teaching Practices in Terms of Use of Appropriate Material obtained very high ($M=3.63$, $SD=0.41$) which connoted that teachers carefully select and design teaching materials and presentations for discussion to assure students' learning and mastery of the competency

It is evident that teachers strongly agree ($M=3.67$, $SD=0.47$) on their practice of selecting relevant and engaging materials. This means that teachers often plan the instructional materials to integrate into the lesson, which assures mastery of learning by considering their relevance to students' levels of understanding and learning objectives.

Moreover, the teachers strongly agree ($M=3.61$, $SD=0.49$) that they practice using presentations to convey information and materials that enhance students' understanding of the subject. This clarifies that the teachers practice the utilization of interactive presentations like PowerPoint and technology aids to develop students' understanding of the competencies and the topic in a particular subject.

Level of Students Learning

In this study, the level of students' learning refers to the ability of the learners to process information and remember significant facts presented during the teaching-learning process, which was focused on knowledge retention, information literacy, attitude toward learning, self-efficacy, and learning, and engagement and participation.

Table 9 Level of Students' Learning in Terms of Knowledge Retention

Statements	Mean	SD	Remarks
<i>My students easily recall information learned from the previous topics discussed.</i>	3.56	0.50	Strongly Agree
<i>My students actively engage in discussions that reinforce understanding of learned concepts.</i>	3.58	0.50	Strongly Agree
<i>My students were able to apply what they learned from the concepts discussed.</i>	3.64	0.48	Strongly Agree
<i>My students were able to share and explain learned concepts to someone else.</i>	3.48	0.53	Strongly Agree
<i>My students were able to adapt and connect lessons to real-world examples.</i>	3.53	0.50	Strongly Agree
Weighted Mean	3.56		
SD	0.37		
Verbal Interpretation	Very High		

Table 9 describes the level of students' learning in terms of knowledge retention. It is evident that the learners level of students' learning in terms of knowledge retention obtained a very high ($M=3.56$, $SD=0.37$) implies that students could recall information presented from the previous discussion and connect its application to similar problems encountered related to the topic.

The table shows that the teachers strongly agree ($M=3.64$, $SD=0.48$) that their students had the ability to apply what they learned from the concepts discussed. This denotes that the students developed the capacity to put the theories into action and applied them to problems perceived to align with the competencies learned during the discussion.

Also, the teachers strongly agree ($M=3.48$, $SD=0.53$) that the students from their class can share and explain learned concepts to someone else. This indicates that the students develop the ability to share the ideas perceived during the discussion and explain the concepts as part of sharing knowledge.

Knowledge retention refers to an individual's ability to store newly acquired information in their long-term memory, allowing them to recall and apply it quickly. In simpler terms, it is about ensuring that the information learned. Knowledge retention is the capacity of an individual to effectively store newly acquired information in their long-term memory, enabling them to readily recall and apply it when needed. Put simply, it's the assurance that the information learned remains accessible and useful over time.

Table 10 Level of Students' Learning in Terms of Information Literacy

Statements	Mean	SD	Remarks
<i>My students can critically evaluate the quality and reliability of information sources.</i>	3.47	0.50	Strongly Agree
<i>My students were confident in their ability to search for information effectively.</i>	3.48	0.50	Strongly Agree
<i>My students know how to cite sources in my assignments properly.</i>	3.56	0.53	Strongly Agree
<i>My students were skilled at synthesizing</i>	3.53	0.50	Strongly Agree

information from multiple sources.

My students can identify credible and trustworthy websites for research purposes.

3.50 0.50

Strongly Agree

Weighted Mean

3.51

SD

0.40

Verbal Interpretation

Very High

Table 10 describes the level of student's Learning in terms of Information literacy. The learners' level of learning regarding information literacy obtained very high ($M=3.51$, $SD=0.40$) implies that the students could analyze the validity and reliability of information and its application through analysis and synthesis. The students can process the information from other sources assigned to the given facts in the discussion.

According to Rantanen (2019), when finding, retrieving, analyzing, and using the table presented, the learners strongly agreed ($M=3.56$, $SD=0.53$) that they had the ability to cite sources properly when doing the assignments. The results show that the students develop the ability to properly cite the sources of information included in their assignments, as it is the proper practice of citation and research.

Also, the teachers strongly agree on the student's ability to critically evaluate the quality and reliability of information sources. This shows that the learners practiced evaluating the reliability and validity of information obtained through searching by critically analyzing its correctness ($M=3.47$, $SD=0.50$).

Table 11 Level of Students' Learning in Terms of Attitude Towards Learning

Statements	Mean	SD	Remarks
My learners find learning new things to be enjoyable.	3.73	0.45	Strongly Agree
My learners were interested in exploring topics beyond what is required.	3.66	0.48	Strongly Agree
My learners find challenges in learning to be stimulating rather than discouraging.	3.69	0.47	Strongly Agree
My learners were proactive in seeking out learning opportunities.	3.47	0.50	Strongly Agree
My learners were motivated to learn and acquire new knowledge/skills.	3.55	0.50	Strongly Agree
Weighted Mean	3.62		
SD	0.37		
Verbal Interpretation	Very High		

Table 11 describes the level of student's Learning in terms of attitude towards Learning. The learners' level of student learning in terms of attitude towards Learning obtained a very high ($M=3.55$, $SD=0.40$). This entailed that students could maintain their interest in the learning process despite their challenges with different topics. They found the strategy to actively engage in the discussion and learning process.

The table indicates that the teachers strongly agree ($M=3.69$, $SD=0.47$) that the students find challenging activities stimulating rather than discouraging. This denotes that the students are willing to accept the challenging activities and process learning as they think critically and are involved in the discussion.

Additionally, it is well known that students' positive views about Learning support their efforts to become knowledgeable in a subject. In essence, learning is a personal performance. Because of this, attitudes toward Learning, whether favorable or unfavorable, are crucial to learning success.

Moreover, it is widely acknowledged that students' optimistic attitudes toward learning bolster their endeavors to acquire knowledge in a particular subject. Essentially, learning is regarded as an individual endeavor, and therefore, the attitudes towards learning, whether positive or negative, play a pivotal role in determining one's success in the academic endeavors.

The teachers also strongly agree ($M=3.47$, $SD=0.50$) that the learners are proactive in seeking out learning opportunities. This conveys that the students are willing to exert effort in class and, after discussion, to seek resources that sustain their curiosity to learn and enhance their competencies.

Table 12 Level of Students' Learning in Terms of Self-Efficacy & Learning

Statements	Mean	SD	Remarks
<i>My learners have the skills necessary to accomplish my learning goals.</i>	3.56	0.50	Strongly Agree
<i>I am confident in my learner's ability to learn new concepts and skills.</i>	3.70	0.46	Strongly Agree
<i>I am confident in my learner's ability to overcome challenges in the learning process.</i>	3.53	0.50	Strongly Agree
<i>My students can complete complex tasks related to my Learning.</i>	3.47	0.50	Strongly Agree
<i>I am confident in my learner's ability to master complex subjects, lessons, and discussions.</i>	3.47	0.50	Strongly Agree
Weighted Mean	3.55		
SD	0.34		
Verbal Interpretation	Very High		

Table 12 describes the level of students' learning regarding self-efficacy and learning. The learners' level on student learning in terms of self-efficacy and learning obtained very high ($M=3.55$, $SD=0.34$). This indicates that learners have the ability to ensure the quality of their learning process and their own competency as they can comply with different activities on time.

The data shows that the respondents strongly agree ($M=3.70$, $SD=0.46$) that students are confident in learning new concepts and skills. This entails that learners were open to accepting new knowledge and had the ability to cope with new skills presented during the discussion on the subject. They can comply with the activities required based on the concept presented and perform specific tasks aligned with the learners' expected skills.

Also, teachers on the student's abilities to complete complex tasks related to learning and master the complex subject, lesson, and discussion obtained very high ($M=3.47$, $SD=0.50$). This means that the learners are confident in their ability to learn complex concepts in the lesson and discussion and that they can comply with different tasks assigned to them by the teachers as part of the teaching and learning process.

Table 13 Level of Students' Learning in Terms of Engagement and Participation

Statements	Mean	SD	Remarks
<i>My students are actively involved in discussions and activities.</i>	3.63	0.49	Strongly Agree
<i>My students were committed to their success and progress.</i>	3.61	0.52	Strongly Agree
<i>My students are enthusiastic about attending and participating in groups, discussions, and performances at events and meetings.</i>	3.61	0.49	Strongly Agree
<i>My students are motivated to contribute their ideas and efforts towards their goals.</i>	3.44	0.50	Strongly Agree

<i>My students participate in group discussions and decision-making processes.</i>	3.56	0.53	Strongly Agree
Weighted Mean	3.57		
SD	0.37		
Verbal Interpretation	Very High		

Table 13 describes the level of students' Learning in terms of positive behavior toward Learning. It is evident that the students' learning in terms of engagement and participation obtained very high ($M=3.57$, $SD=0.37$) on this level. This denotes that learners show appropriate behavior and desired to learn by engaging actively in different teaching and learning processes that will contribute greatly to their development.

The table shows that the teachers strongly agree ($M=3.63$, $SD=0.49$) that their students are actively involved in discussions and activities. This entails that the learners were participative in the discussion process by sharing ideas and experiences that clarified the concept and provided questions that reinforced their Learning. Also, learners were actively involved in different learning tasks assigned as part of the teaching-learning process to enhance their competencies.

Moreover, although ranked last among the indicators, the teachers in Santa Cruz District strongly agree ($M=3.44$, $SD=0.50$) that students are motivated to contribute their ideas and efforts towards their goals. This indicates that the learners are exerting their very best to actively participate during the discussions and activities to achieve their learning goals and master competencies.

In this study, the hypothetical question determined the relationship of the independent variables, particularly the teacher's profile, to the dependent variables, which happened to be the teaching practice and student learning.

Peer collaboration is another essential component, as it not only encourages teamwork but also provides opportunities for observational learning and skill-sharing.

The following table reveal the relationship of the teachers' profiles to teaching practices and student learning, showing the p-value, strength of relationship, and verbal interpretation.

Significant Relationship Between Teachers' Profile to Teaching Practices and Students Learning

Table 14 presents the significant relationship between the teachers' profile to the teaching practices.

Table 14 Significant Relationship Between Teachers' Profile to Teaching Practices and Students Learning

Profile		Teaching Practices					Students' Learning			
		Mastery Learning	Assessment Feedback	Lecture Presentation	Discussion	Appropriate Materials	Knowledge Retention	Literacy	Attitude Towards Learning	Efficacy & Positive Behavior Toward Learning
Age	Pearson Correlation	-0.344	-0.421	-0.29	-0.231	-0.17	-0.157	-0.194	-0.156	-0.221
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant
Sex	Pearson Correlation	-0.208	-0.149	-0.176	-0.169	-0.139	-0.185	-0.136	-0.265	-0.153

	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.0322	-0.112	-0.196	-0.072	-0.014	-.006	-0.089	-0.139	-0.162
Civil Status	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	-0.046	-0.144	-0.153	-0.109	-0.062	-0.085	0.0909	0.0443	-0.033
Highest Educational Attainment	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	-0.281	-0.359	-0.188	-0.133	-0.128	-0.072	-0.127	-0.081	-0.171
Number Of Years Service	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.0472	-0.053	-0.219	-0.09	-0.064	0.0383	-0.115	0.0614	-0.069
Number Of Conducted Action Research	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.0328	-0.014	-0.193	-0.083	-0.044	-0.004	-0.087	-0.148	-0.192
Areas Of Specialization	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	289	289	289	289	289	289	289	289	289
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.0234	0.0912	0.0691	0.1071	-0.121	-0.254	-0.01	-0.057	-0.195
Number Of Teaching Load	Pearson Correlation									

Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
N	289	289	289	289	289	289	289	289	289	289
Analysis	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant

The data showed that teacher's profile in terms of age, sex, civil status, highest educational attainment, number of years in service, number of conducted action research, areas of specialization, and number of teaching load were observed to have relationship to teaching practices in terms of mastery of learning, assessment feedback, lecture presentation, and use of appropriate material. This is based on the computed r values obtained from the tests. Furthermore, the p -values obtained were less than the significance alpha of 0.05; hence, which implied that the profile of the teachers teaching sciences and experiences in the field of teaching with ancillary loads aided teachers to develop different strategies in dealing students' needs as they were able to evaluate effective methodologies to apply in different situation.

Moreover, teachers' profile in terms of age, sex, civil status, highest educational attainment, number of years in service, number of conducted action research, areas of specialization, and number of teaching load also played significant predictors in students learning in terms of knowledge retention, information literacy, attitude towards learning, self-efficacy & learning and positive behavior based on the computed r -values obtained from the tests with very weak to weak relationships. Furthermore, the p -values obtained were less than the significance alpha of 0.05; hence, there is a significance which emphasized that teacher's profile played an important role in enhancing student learning of different competencies through their learning experiences. Teacher's professional development in field of teaching improved student's learning experiences as they were able to craft different methods that captured students' interest in complex idea simplified with innovative approach of teachers given with time, studies and research to improve the practice.

Significant Relationship Between the Research Orientation to Teaching Practices and Student Learning

Table 15 presents the significant relationship between research orientation to teaching practice and students' Learning.

Table 15 Significant Relationship Between the Research Orientation to Teaching Practices and Student Learning

Research Orientation		Teaching Practices					Students' Learning				
		Mastery Learning	Assessment Feedback	Lecture Presentation	Appropriate Material	Knowledge Retention	Information Literacy	Attitude Towards Learning	Efficacy & Learning	Engagement and Participati	
Seminar Attended	Pearson Correlation	0.58	0.629	0.413	0.412	0.349	0.285	0.362	0.377	0.27	
	Sig. (2-tailed)	0.003	0.003	0.001	0.000	0.000	0.004	0.000	0.000	0.000	
	N	63	63	63	63	63	63	63	63	63	
	Analysis	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	
Engaged	Pearson Correlation	0.577	0.629	0.413	0.412	0.349	0.285	0.362	0.377	0.27	

Peer Coaching	Sig. (2-tailed)	0.000	0.003	0.001	0.000	0.000	0.004	0.000	0.000	0.000
	N	63	63	63	63	63	63	63	63	63
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.563	0.633	0.509	0.508	0.428	0.552	0.436	0.517	0.424
Peer Coaching	Sig. (2-tailed)	0.073	0.946	0.336	0.002	0.09	0.382	0.006	0.1	0.062
	N	63	63	63	63	63	63	63	63	63
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.524	0.459	0.665	0.547	0.409	0.461	0.502	0.542	0.452
Personal Growth	Sig. (2-tailed)	0.167	0.694	0.447	0.004	0.175	0.644	0.009	0.187	0.112
	N	63	63	63	63	63	63	63	63	63
	Analysis	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>Significant</i>
	Pearson Correlation	0.524	0.459	0.665	0.547	0.409	0.461	0.502	0.542	0.452

The Seminars attended, peer coaching, research engagement, and personal growth of research orientation to teaching practices was observed to influenced the mastery of learning, assessment feedback, lecture presentation, and use of appropriate material of teaching practices and knowledge retention, information literacy, attitude towards learning, self-efficacy & learning, and positive behavior towards students learning. This is based on the computed r-values obtained from the tests with weak to solid relationships. Furthermore, the p-values obtained were less than the significance alpha of 0.05. Teacher's initiative in attending research related seminar and exchange of idea leaded them to their growth in the profession as they were able to perceived solutions in problems encountered in curriculum delivery and assessment through innovative strategies and integrating concepts learned from the findings of the research. With these, the teacher enhances their innovative thinking of teaching students and assessment of the approach effectiveness. The results showed that teachers' research engagement significantly affected the students' learning. Teachers develop different strategies and approaches from the research process and output that they may apply in their own lesson delivery strategies to address students' various learning styles and needs.

Moreover, teachers' orientation by attending seminars, research engagement, peer coaching and personal growth affects the development of students' learning as evident in the computed p-value lower than 0.05 which implied significance. The teachers' willingness to attend seminars and related activities to improve their professional knowledge in conducting action research aided the student's interest and learning experiences in sciences as the approaches and lesson content were based on research findings that best developed the student's different competencies in the subject. Innovative strategies applied in teaching science concept improved student learning and interest in the subject as they perceived new way of simplifying complex idea and improved the student's mastery.

The findings presented on this qualitative analysis were based on the goal of this research to identify how the science teachers' research orientation affect the teaching practices and student learning. The researcher through interview with the experienced teacher in the department of education who are teaching science subjects and engaged in different research activities. These set of teachers were composed of mixed both single and married. In the observance of ethical consideration names of the respondents were not

revealed instead pseudonyms were assigned to the subjects who shared the information for this interview.

4. Conclusion and Recommendation

This study would like to determine the significant relationship between variables particularly teacher's profile and teaching practices. Additionally, it also sought to test the relationship research orientation to teaching practices and students learning in science subject. With this, the following conclusion were drawn from the results of this study:

Teachers profile was observed to have relationship to teaching practices thus signified rejection of null hypothesis as teachers teaching sciences and experiences in the field of teaching with ancillary loads aided teachers to develop different strategies in dealing students' needs as they were able to evaluate effective methodologies to apply in different situation. Moreover, teachers' profile also played significant predictors in students learning thus signified rejection of null hypothesis as teacher's professional development in field of teaching improved student's learning experiences which they were able to craft different methods that captured students' interest in complex idea simplified with innovative approach of teachers given with time, studies and research to improve the practice.

Research orientation was observed to influence students learning thus signified rejection of the null hypothesis. Teacher's initiative in attending research related seminar and exchange of idea led them to their growth in the profession as they were able to perceived solutions in problems encountered in curriculum delivery and assessment through innovative strategies and integrating concepts learned from the findings of the research. Also, teachers orientation affected the development of students' learning thus signified rejection of the null hypothesis as the teachers' willingness to attend seminars and related activities to improve their professional knowledge in conducting action research aided the student's interest and learning experiences in sciences as the approaches and lesson content were based on research findings that best developed the student's different competencies in the subject.

Based on the findings and conclusions made, the following recommendations were forwarded.

1. The school may customize inclusive training programs for all teachers with diverse backgrounds in crafting action research, which may contribute to their accomplishment of the research project.
2. The school should enhance the research culture among teachers by allowing them to attend seminars and practice peer coaching to improve their research engagement and personal growth.
3. The teachers should create platforms to practice teaching innovations based on research, including teaching strategies like mastery learning, giving feedback, and using teaching materials.

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