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Science Teachers' Collegiality and Professional Identity on Students' Learning Outcomes

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Abstract*: In the school year 2022–2023, this study examined the effects of teachers' professional identities and collegiality on students' learning outcomes in science in secondary schools in San Luis, Pampanga. Explanatory sequential mixed methods was the research design, and 45 Science teachers participated in the study. The results showed that the Science teachers believed that collegiality was very true in their respective schools when it came to demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching one another, and sharing resources. Similar to how they described their teaching identities, these educators believed that their professional development, socialization, career advancement, and competency were all very true of them. The secondary public school pupils' learning outcomes in science were deemed to be "satisfactory."According to the study's findings, the following conclusions were made: There is a substantial correlation between the students' learning outcomes in science and the collegiality and professional identity of the public secondary Science instructors. Additionally, the collegiality and professional identity of science teachers benefit students' education in science.*

Keywords—collegiality, professional identity, joint planning, professional socialization, career progression, professional competence.

Introduction

The results of student learning have a direct correlation with a variety of variables, including how teachers conduct themselves in front of pupils. Collegiality and an understanding of one's professional identity are seen as crucial elements in the effectiveness of student learning. One's identity as a professional is shaped by how one is perceived by the public, both locally and globally, as well as by oneself. The idea of a teacher's identity is how they define themselves as educators, encompassing their professional selves and the people they aspire to become while continuously reflecting on their experiences and activities. On the other side, collegiality is a feeling of unity among coworkers.Collegiality plays an essential role in augmenting teacher's professional growth and development, professional commitment, and job satisfaction.

A teacher constantly creates and develops a reflective sense of self by using his or her practice and life as a mirror to examine their own identity as teachers (Palmer, 1997). Collegiality is recognized as an essential component of teacher professional development and as a means of enhancing teacher knowledge. Teachers frequently consider the traits and traits associated with teacher individualism, isolation, and privatism as challenges to or hurdles to their professional development (Madiha Shah, 2012).

The professional's perspective of himself or herself and how the outside world, both nearby and far away, perceives him or her both influence the professional's sense of self (Yazdani & Ghasedi, 2021). The social context has an impact on one's professional identity in the same way that it has an impact on other parts of an individual's identity. The social context, for instance, influences how a person's job and social standing are perceived by others, as well as how a professional interacts with clients, coworkers, and other professionals and how she interprets her professional experiences.

For teachers, creating a sense of belonging in their own classrooms is the first step towards forging a strong sense of one's own professional identity. When they represent their profession to other professionals and the general public, they will be at an advantage. Professional identity is crucial for the field as a whole and for its practitioners in particular. Practitioners who have a solid foundation in their professional identity are better able to understand the work they undertake and differentiate between different professions (Pistole & Roberts, 2002 in Heled & Davidovich, 2019).

It is generally acknowledged that in order for the general public to recognize a profession, it must have a distinct professional identity. It has been demonstrated that there is a connection between a person's professional identity and performance, and that having a strong sense of one's professional identity contributes to one feeling safe, assured, and proud of one's employment (Watson, 2006; LaFleur, 2007; Calley & Hawley, 2008; Pistole & Roberts, 2002 in Heled & Davidovich, 2019).

Personal professional identity is defined in the literature as an element of one's self-identity that provides an answer to the question "Who am I, or what am I as a professional?" The sense of belonging to and identification with the profession that a practitioner has is referred to as

personal professional identity (Tickle, 1999 in Singha & Sikdar, 2018).

Consolidating one's professional identity is a step in the process of professional growth, which starts during training and continues throughout a person's professional career. The process of developing and preserving a professional identity is fluid and influenced by interactions with social and cultural contexts. Professional identity is influenced by the shared cultural values, expectations, outlooks, and attitudes that are at the core of a profession's identity. As part of a process of professional socialization that is facilitated by encounters with coworkers, other professionals, and members of the general public, practitioners embrace all of these facets of their job (Singha & Sikdar, 2018).

The value of teachers in education is self-evident. Teachers are accountable for resource selection, classroom organization, providing learning opportunities, and monitoring students' progress. The teachers' professional identity is critical in determining educational efficiency.

The importance of collegiality in teacher professional development is widely acknowledged. Individuality, solitude, and privatism among teachers are frequently perceived as obstacles to their professional development (Shah, 2016). This boosts enthusiasm among teachers while lowering stress and burnout. Additionally, it improves the connections between group members. Teachers who work in a collaborative environment are more committed to their company and field. It appears that teachers who worked together felt more committed to their objectives and students.

In a collaborative setting, educators are more receptive to novel concepts, pedagogical approaches, and materials. Collegiality among the staff improves flexibility and instructor satisfaction. It reduces isolation in the classroom and gives teachers something fun to do every day. Collegiality aids educators in dealing with complexity and ambiguity, adjusting to change fast, and fostering a culture of risk-taking and advancement (Tsveture, 2018). It is believed that teachers who work together are better equipped to handle new demands that would typically drain their energy and resources and are more flexible to change.

Collegiality is often described as an important component in successful collaborative professional work (Brante, 2005; Evetts, 2010; Hargreaves, 1994; Paoline, 2003). In some point, it has been claimed that teacher collegiality counteracts attrition (Heider, 2005), encourages professional development, and has a positive impact on job satisfaction and student performance (Shah, 2012). Put simply, successful collaboration based on trustful collegial relations appears to be an antidote to the teacher isolation and weak claims of teacher professionalism described by Lortie (1975). However, some research also takes a more critical stance and describes teacher collegiality as a two-sided coin, stressing on the one hand processes of joint meaning-making and consensus regarding values and norms, and on the other hand a micro-political side with conflicts of interests and different agendas between teachers or groups of teachers (Hargreaves, 1994; Kelchtermans, 2006). Research on teacher collegiality has described how different forms of collegiality evolve in schools and influence teachers' professional work (Hargreaves, 1994; Jurasaite-Harbison & Rex, 2010) and how emotions are involved in processes of trust or distrust in collegial relations (Clement & Vandenberghe, 2000; Cowie, 2011; Hargreaves, 2001; Löfgren & Karlsson, 2016).

With the hope of improving the academic performance of the high school students, this study will be conducted in order to determine the level of collegiality and professional identity of the Science teachers.

Statement of the Problem

The study determined the influence of teachers' collegiality and professional identity on the Science learning outcomes of students in public secondary schools in San Luis, Pampanga during the First Quarter of School Year 2022-2023.

Specifically, it sought answers to the following questions:

1. How may the collegiality of the public secondary Science teachers be described in terms of:
   1.1 demonstrating mutual support and trust;
   1.2 joint planning and assessment;
   1.3 sharing ideas and expertise;
   1.4 teaching each other; and
   1.5 sharing resources?
2. How may the professional identity of the public secondary Science teachers be described in terms of:
   2.1 teaching beliefs;
   2.2 professional socialization;
   2.3 career progression;
   2.4 professional competences?
3. How may the learning outcomes of the public secondary students be described in terms of their average grade in Science?
4. Is there a significant relationship between the collegiality of the public secondary Science teachers and the learning outcomes of their students?
5. Is there a significant relationship between the professional identity of the public secondary Science teachers and the learning outcomes of their students?
6. What are the views and insights of the respondents as regards the importance of teachers' collegiality and professional identity on students' learning outcomes in Science?
7. What program of activities can be crafted from the results of the study?

Hypotheses

The hypothesis that follows was tested in the study:

There is no significant relationship between the collegiality of the public secondary Science teachers and the learning outcomes of their students; There is no significant relationship between the professional identity of the public secondary Science teachers and the learning outcomes of their students.

Conceptual Framework

A variety of factors outside of students' direct control have a significant impact on their academic achievement. The educational outcomes of students are influenced by a wide range of factors. It is commonly acknowledged that effective schools and improved instructors depend on strong and positive collegial connections amongst educators. According to research, it has been stated that high levels of collegiality among staff members are one of the qualities that can be found in the majority of successful schools. Strong collegial connections have repeatedly been shown to contribute to school improvement and success (Shah, 2016).

In order to promote greater collegiality and collaboration among their pupils, teachers are increasingly being urged to abandon traditional ideas of isolation and autonomy. In order to give students the best service possible, make their work more meaningful, and change education in a way that guarantees it remains vibrant and relevant, teaching colleagues must have opportunities to collaborate. The collegial engagement of educators has not always been a common practice in schools, making it difficult for them to find the time to converse or work together on projects. Organizational theory concepts that were first created in the business world support the idea that educators work more effectively when they collaborate on a professional level (Shah, 2016).

Pragmatism is an educational philosophy that says that education should be about life and growth. That is, teachers should be teaching students things that are practical for life and encourage them to grow into better people. These principles have been more or less realized in science education, especially in secondary schools and on the college and university levels. (Ormerod, 2020).

Collegiality is considered to be an essential part of teachers' professional development and a way to improve teachers' skills. They see teacher individualism, seclusion, and privatism as hazards to or obstacles to the professional development of the teachers who hire them. Schools are restructuring so that instructors can cooperate more often since it is thought that this will help them learn and develop as professionals. Collegial environments encourage teachers to be more imaginative and passionate about their profession. They also aid educators in acquiring more professional development funding. Numerous educators and researchers have stated that the greatest method to assist teachers in growing and improving is to keep them in constant contact with one another and to provide them with support (Shah, 2016).

When instructors collaborate, they can effectively manage ambiguity and complexity, respond rapidly to rapid change, and foster an environment that fosters risk taking and continuous development. Many individuals assert that when teachers collaborate, they become more adaptable to changing circumstances. Additionally, they have greater energy and resources to deal with novel situations that would ordinarily overwhelm teachers on their own (Alkhannani, 2021). A critical component of enacting change in schools is cultivating collaborative cultures founded on the concepts of collegiality, openness, and trust. Teachers who collaborate are more likely to have a positive self-image. Individualism and non-interference policies have been demonstrated to decrease teachers' confidence in their own work, making it more difficult for them to assist pupils in learning. Teachers having strong emotional ties to their coworkers are considered to be more energized while instructing (Vangrieken et al., 2015).

Professionalism, which is defined as the expert characteristics of a professional or the practice of an activity as a profession, is closely tied to professional identity. The degree of competence that sets a professional apart from the general public is professionalism. It is necessary to be able to uphold current laws and regulations while simultaneously having the guts to modify them. Professionalism also requires striking a healthy balance between one's personal and professional lives. It entails living a practical and responsible lifestyle (Yazdani, & Ghasedi, 2021).

On the other hand, teachers' professional identity varies significantly in a variety of ways. While some instructors invest time and effort in professional development, others choose not to. Experienced teachers receive less institutional support for professional development than rookie teachers, which may alter experienced teachers' attitudes toward professional development activities (Ivanova & Skara-MincĿne, 2016). Teachers who are expected to manage a diverse variety of activities and demands in this environment must constantly redefine their professionalism and professional development and teacher professionalism is inextricably linked to professional development (Singha & Sikdar, 2018).

It is the personality, spirit, and skills exemplified by the profession's established practice (Singha & Sikdar, 2018).

The various social and cultural roles that teachers are expected to take on during their interactions with pupils while the learning process is underway make up their unique professional identities. These roles are adaptable and change in response to the social interactions that occur in the classroom. Numerous elements, such as one's personal history, culture, professional circumstances, age, gender, and the culture of one's school and classroom, can have an impact on one's identity (Singha & Sikdar, 2018).

In this way, identity is a concept that symbolizes how individuals perceive themselves as well as how they carry out their responsibilities in a variety of situations. Because of this, teacher development is used to facilitate the learning of new teachers. The process involves not just learning new teaching skills and information, but also coming to terms with what it means to be a teacher in the first place.

From the theory, related studies and literature cited, presented and explained above, the researcher came up with the conceptual framework that served as guide in the conduct of the study.

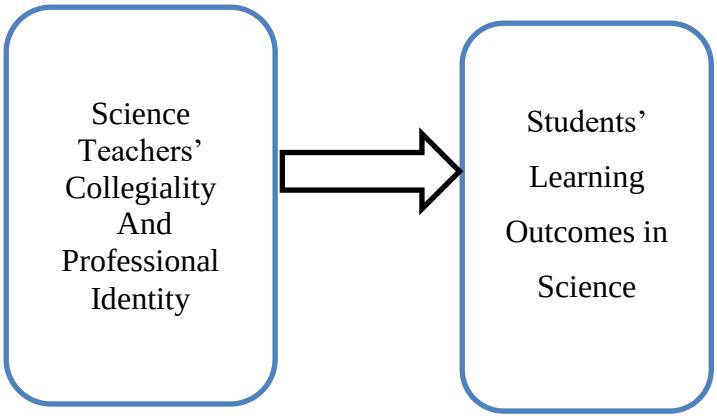


Figure 1. Conceptual Framework

Figure 1 shows that the independent variables are the Science teachers' collegiality and professional identity. These variables were hypothesized to influence (as implied by the arrowhead) the dependent variable which is the students' learning outcomes in science.

Significance of the Study

The study is beneficial and important in the educational arena. It will help the educators understand the influence of science teachers' collegiality and professional identity in students' learning outcomes in science, and it will ultimately benefit the following:

Students. They are the primary beneficiaries of the study's findings. The students have the greatest impact on their learning outcomes when the researcher has established a link between collegiality and professional identity and their learning outcomes. The findings will eventually result in a shift in the teachers' collaboration and identity when dealing with their students.

Teachers. The study is of great importance to teachers because it will generate knowledge and awareness on the importance of collegiality and professional identity in the learning outcomes of the students. Further, the results of the study could serve as a basis for teachers to consider attending training and other activities on how to improve and develop their collegiality and professional identity to positively influence the students' learning outcomes in science.

School Administrators. The findings can make the school administrators concrete evidence on the influence of collegiality and professional identity in the learning outcomes of the students. They can include the variables under study in their plan of activities on how to improve and develop teachers' collegiality and professional identity to positively influence the students' learning outcomes in science.

Future Researchers. Results of the study will serve a reference for researchers who have the same interests. The study will help the future researchers to fully understand the importance of the influence of collegiality and professional identity in the learning outcomes of the students.

Scope and Limitation of the Study

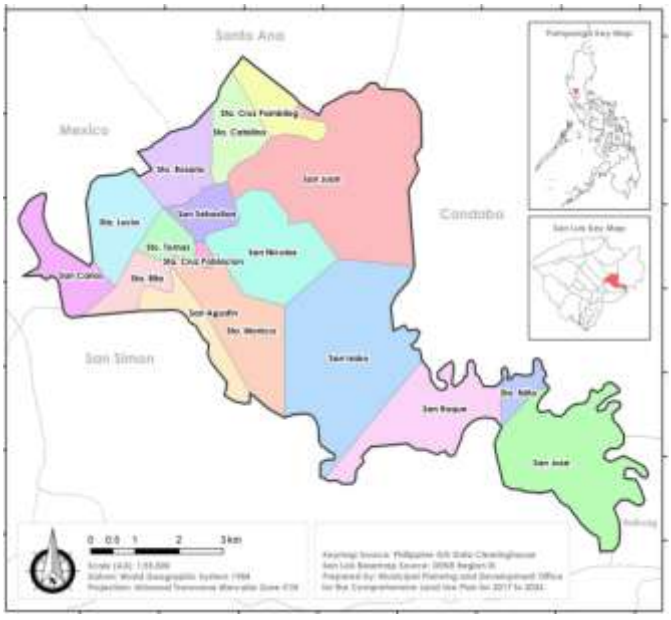
The research focused only on the influence of collegiality and professional identity in the Science learning outcomes of the students.

The collegiality of the public secondary Science teachers was described in terms of demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching each other, and sharing resources. On the other hand, the professional identity of the public secondary Science teachers was described in terms of teaching beliefs, professional socialization, career progression, and professional competence. Lastly, the learning outcomes of the public secondary students are described in terms of their average grade in Science.

The respondents of this study were the public secondary schools Science teachers in San Luis, Pampanga. This study was conducted in the First Quarter of School Year 2022-2023.

The study was conducted in San Luis, Pampanga. The schools that served as respondents of this research are: (1) Emigdio A. Bondoc High School; (2) San Carlos San Luis National High School; (3) San Isidro National High School; (4) San Jose Integrated School, (5) San Juan High School, (6) San Luis National High School, (7) San Nicolas Integrated School; and (8) Sta. Catalina High School

Location of the Study



(Source: Philippine GIS Data Clearinghouse San Luis Basemap Source: DENR Region III/Prepared by: Municipal Planning and Development Office for the Comprehensive Land Use Plan for 2017 to 2026)

Figure 2. Map of San Luis, Pampanga

Definition of Terms

To shed the light in understanding, the following operational definitions are hereby presented.

Career progression. This refers to Science secondary teachers' advancement in the teachers' professional life.

Collegiality. This refers to the Science secondary teachers' companionship and cooperation amongst coworkers who are responsible for the same task.

Demonstrating mutual support and trust. This refers to the Science teachers' way of expressing accommodation and confidence with one another.

Joint planning and assessment. This refers to the Science teachers' joint evaluation that entails the participation of all parties in the decision-making process about the assessment's conception, design, and delivery.

Learning outcomes. This refers to students' grade in Science in the first grading period of the SY 2022-2023

Professional competence. This refers to specific talents, expertise, and characteristics that are prized by professional associations, organizations, and entities associated with the teachers' career.

Professional identity. This refers to the Science secondary teachers' attitudes, values, knowledge, beliefs, and abilities that are shared among members of a professional organization.

Professional socialization. This refers to the Science secondary teachers' registration as an official member of a professional organization.

Sharing ideas and expertise. This refers to the Science secondary teachers' activity of cooperating and brainstorming with others on a topic or in relation to a common concern.

Sharing resources. This refers to the Science secondary teachers' sharing of any resources available to the teachers needed by another teacher

Teaching beliefs. This refers to the Science secondary teachers' beliefs to gain an understanding of, make judgments about student learning outcomes and evaluate the activities of other teachers.

Teaching each other. This refers to the Science secondary teachers' method by which two or more teachers collaborate to teach, instruct, and mentor the same group of students.

CHAPTER II

METHODOLOGY

The information about the research and sampling procedures that was utilized by the researcher is provided in this chapter. The research design that was employed, as well as the data gathering techniques, and data analysis scheme are also discussed in this chapter.

Research Design

The explanatory sequential mixed methods research design was used to determine the Science teacher collegiality and professional identity on students learning outcomes. The explanatory method was divided into phases for quantitative and qualitative data collection. Quantitative findings were utilized to drive participant selection and question formulation during the qualitative phase. This technique makes use of qualitative data to explain early quantitative findings; thus, it is vital to link quantitative and qualitative data collection. Qualitative interviews are occasionally undertaken following the gathering of survey data to assist in understanding unclear, contradicting, or atypical survey replies. The technique for data gathering was divided into two stages: quantitative and qualitative sampling. That is, determining which quantitative findings to track and who to interview. It is predicated on quantitative results. This was determined by significant interrelated variables, insignificant discoveries, or simply demography. Using demographic data, the researcher discovered various socioeconomic groups respond differently to dependent variables. Thus, qualitative data gathering was utilized to categorize respondents before to the quantitative phase. The design was created with the intention of delving deeper into the quantitative findings. Then qualitative follows. The technique conducted after analyzing quantitative and qualitative data, the researcher joins the two databases. This was proven through a sequential design. This is an open-ended inquiry in which each database complements the others and data collecting can take place over time. (Creswell & Creswell, 2018).

Data Gathering Techniques

Prior to initiating the data collection process for the study at secondary schools in San Luis, Pampanga, the researcher obtained authorization from the head of the Schools Division of Pampanga. Upon receiving the authorization, the researcher started to collaborate with the principals of the schools to schedule a date and time for data collection. The researcher communicated to them via social media, email, and phone calls. They required completing questionnaires and participating in an interview.

Data from both quantitative and qualitative sources was gathered for the study, and the results were analyzed in detailed. The researcher conducted a closed-ended questionnaire in order to obtain quantitative information. Instead of standard procedures such as surveys and polls, semi-structured interviews were conducted in order to obtain qualitative information. An open-ended questionnaire was created by the researcher in order to address some of the problems during a telephone interview.

In the quantitative data gathering, the questionnaire that was utilized composed of two parts. Part I is the Teacher Collegiality Scale adapted from Crampton (2015) rated with the following scale, 5 Very True of Me (VTM), 4 True of Me (TM), 3 Somewhat True of Me (STM), 2 Slightly True of Me (ST), and 1 Not True of Me (NT). This contained items on demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching each other and sharing

resources. Part II was the Teachers' Professional Identity Scale adapted from Hariri, Karwan, Haenilah, Rini, and Suparman, (2021) rated with 5 Very True of Me (VTM), 4 True of Me (TM), 3 Somewhat True of Me (STM), 2 Slightly True of Me (ST), and 1 Not True of Me (NT). This contains statement items on values as teaching beliefs, professional socialization, career progression, and professional competence.

For the academic achievement of the students, the researcher obtained their grades in the First Quarter of School Year 2022-2023 from their respective Science teachers.

Sampling Procedures

Total enumeration was utilized in selecting the respondents of the study. All 45 Science teachers in public secondary schools in San Luis, Pampanga were requested to participate in the collection of quantitative data for this research.

Table 1. Distribution of Respondents of the Study

School	Number of Science Teachers
1. Emigdio A. Bondoc High School	8
2. San Carlos San Luis National High School	5
3. San Isidro National High School	8
4. San Jose Integrated School	4
5. San Juan High School	5
6. San Luis National High School	12
7. San Nicolas Integrated School	1
8. Sta. Catalina High School	2
Total	45

For the qualitative data collection, one (1) teacher per school or a total of eight (8) Science teachers was requested to participate in the semi-structured interviews.

Data Analysis Scheme

After collecting all the questionnaires, these were organized, tallied, tabulated, and analyzed using some statistical tools.

Descriptive statistics such as range, mean and standard deviation were computed to describe the secondary school students' learning outcomes in Science.

Weighted mean was computed to describe the Science teachers' level of collegiality and professional identity.

Correlation analysis was performed to determine if significant relationship existed between the dependent (students' learning outcomes in Science) and independent (Science teachers' level of collegiality and professional identity) variables under study.

For the collected qualitative data, content analysis was performed.**CHAPTER III**

RESULTS AND DISCUSSIONS

This chapter deals with the presentation, analysis and interpretation of the data collected and the results of the statistical treatment employed in the study with the purpose of determining the influence of teachers' collegiality and professional identity on the Science learning outcomes of students in public secondary schools.

The Collegiality of the Public Secondary Science Teachers

Collegiality is seen as a key aspect of teacher professional development and a vehicle to increase teacher knowledge. Collegial communities create such a cooperative climate that heightens the level of innovation and enthusiasm among teachers and provides a continuous support for staff professional enhancement. Many educators and researchers have advocated the methods of teacher growth and enhancement that are based on continuous collegial interaction and support.

The assessments of the public secondary school Science teachers with regard to their collegiality in terms of demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching each other and sharing resources are summarized in Tables 2 to 6.

Demonstrating Mutual Support and Trust

Mutual support is seen as a means to enhance teachers' development in the learning communities. Mutual support contributes to important team outcomes. Teachers who engage in mutual support are more effective. They make fewer errors, help each other out, can correct their own issues, can redistribute tasks so work is completed effectively and efficiently, and are more resilient who engage in mutual support are more effective.

Table 2. The Collegiality of the Public Secondary Science Teachers in terms of Demonstrating Mutual Support and Trust

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. Teachers provide strong social support for colleagues.	37	5	2	1	0	4.73	VT
2. Professional interactions among teachers are cooperative and supportive.	36	4	2	3	0	4.62	VT
3. There is a feeling of trust and confidence among staff members.	34	6	2	3	0	4.58	VT
4. Teachers consider their colleagues as their friends.	44	1	0	0	0	4.98	VT
5. Teachers in the school respect the professional competence of their colleagues.	45	0	0	0	0	5.00	VT
Overall Mean						4.78	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

The assessments of the public secondary school Science teachers with regards to collegiality in terms of demonstrating mutual support and trust are shown in Table 2.

Interestingly, all items indicated in the table including the computed overall mean of 4.78, received the highest verbal description of "very true of me". Further perusal of the table reveals that item "Teachers in the school respect the professional competence of their colleagues" received the highest computed weighted mean of 5.00. Meanwhile, the item "There is a feeling of trust and confidence among staff members" obtained the lowest computed weighted mean of 4.58.

The results imply that Science teachers practiced the value of supporting and working together. Further, these teachers believed that working harmoniously can positively affect and influence their motivation to work and career commitment.

Accordingly, Vangrieken et al. (2015) classify different benefits of and constraints on teacher mutual support and summarize the strengths, depths and challenges of teacher collaboration as have been outlined in the scientific literature. The authors further acknowledge that teacher mutual support is quite a heterogeneous construct, ranging from mere aggregates of individuals to strong team entitativity including, for example, shared goals and values. Different meanings and understandings of teacher mutual support find their expression in various terms used to describe the phenomenon. The literature on teacher mutual support draws on many different expressions such as teacher teams, co-teaching, professional (learning) communities, (teacher) learning teams, or, more broadly, communities of practice (Kolleck, 2019).

In the conducted interview with the Science teachers, they were asked about the ways they demonstrate mutual support and trust among their colleagues. These teachers answered that in their school they always support each other. Whenever their co-teachers have problems, they are always there to comfort and offer whatever help they could extend. Further, they said that in their school they are like family where everyone respect and trust each other.

Joint Planning and Assessment

Teachers plan together regularly in a detailed way. When collaboratively planning, teachers consider the impact on learners and which learners they expect to particularly benefit.

The assessments of the public secondary school Science teachers with regard to collegiality in terms of joint planning and assessment are presented in Table 3.

Table 3. The Collegiality of the Public Secondary Science Teachers in terms of Joint Planning and Assessment

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. cooperation and collaboration exist across departments.	44	1	0	0	0	4.98	VT
2. Science teachers jointly plan and prepare teaching strategies and procedures.	41	2	1	1	0	4.84	VT
3. teachers participate actively in meetings.	40	2	1	2	0	4.78	VT
4. teachers make collective agreements to test an idea or new approach in teaching.	43	1	1	0	0	4.93	VT
5. jointly accredit new programs and practices.	31	6	2	4	2	4.33	VT
Overall Mean						4.77	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

All items indicated in the table including the computed overall mean of 4.77, garnered the highest verbal description of "very true of me". The item "cooperation and collaboration exist across departments" registered the highest computed weighted mean of 4.98. On the other hand, item "jointly accredit new programs and practices" got the lowest computed weighted mean of 4.33.

The results imply that Science teachers firmly believe that working together have a positive impact on each other and contribute naturally to school improvement. When teachers depend on one another for support, they develop relationships based on trust and empathy. These regular interactions are important in forming lasting professional and mentorship relationships. When teachers feel supported, they can better extend that same support to their students.

In conjunction to the present findings, Bolten (2020) asserted that when teachers collaborate, the interests, backgrounds and strengths of each teacher can contribute to a project. If teachers work in a team, they can delegate tasks according to the personality and expertise of each team member. This type of teamwork contributes to a greater sense of trust and accountability, and it allows

teachers to feel confident about contributing their most dynamic skills toward school improvement.

Sharing Ideas and Expertise

Sharing ideas and expertise among teachers is a powerful professional development activity that can help teachers improve their subject knowledge, think about teaching strategies in different ways and learn new ideas to try in the classroom.

The assessments of the public secondary school Science teachers as regards collegiality in terms of sharing ideas and expertise are indicated in Table 4.

Gleaned from the table that item "teachers feel comfortable about discussing their students' problems" received the highest computed weighted mean of 4.89 with a verbal interpretation of "very true of me". On the other hand, item "teachers often ask each other about new instructional ideas and suggestions" got the lowest computed weighted mean of 3.87 with a verbal description of "true of me". The overall mean was registered at 4.24 which are verbally described as "very true of me".

Table 4. The Collegiality of the Public Secondary Science Teachers in terms of Sharing Ideas and Expertise

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. teachers often discuss educational theories, philosophies, or new approaches in teaching.	28	4	6	5	2	4.13	TM
2. teachers encourage each other to contribute ideas and suggestions.	24	5	8	3	5	3.89	TM
3. teachers often ask each other about new instructional ideas and suggestions.	21	8	6	9	1	3.87	TM
4. teachers feel comfortable about discussing their students' problems.	42	1	2	0	0	4.89	VT
5. teachers discuss frequently about school improvement strategies.	32	4	5	3	1	4.40	VT
Overall Mean						4.24	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

The results imply that Science teachers are fully aware that educational and teaching expertise is a powerful gift, especially when shared. Moreover, they knew that sharing each other's experiences can help to discover these successful behaviors and strategies and promote their adaption.

In accordance to the present findings, Swierczek, (2019) opined that every school education institution must utilize its teacher's tacit knowledge by encouraging them to share knowledge and keep learning. School educational institutions like this will become more creative, innovative and lead in the education 4.0. era. Schools can facilitate the management and use of tacit knowledge that is outside the awareness of the subconscious mind of each teacher with an embedding and sharing approach.

Teaching each other

In professional learning communities, all teachers contribute as equals, teaching each other to understand and respond to what is happening for their learners. The focus is on problem-solving together, drawing on both research and student evidence to inform and evaluate changes to practice.

Table 5. The Collegiality of the Public Secondary Science Teachers in terms of Teaching each other

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. often teach each other informally.	28	3	4	5	5	3.98	TM
2. enjoy teaching in teams.	26	4	5	4	6	3.89	TM
3. feel part of a learning community which values shared responsibility for ongoing learning.	39	3	1	2	0	4.76	VT
4. demonstrate on how to use new models or strategies.	27	6	4	2	6	4.02	TM
5. like to share what they have learned or want to learn.	40	1	2	1	1	4.73	VT
Overall Mean						4.28	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

The assessments of the public secondary school Science teachers regarding collegiality in terms of teaching each other are presented in Table 5.

Examined from the table that item "feel part of a learning community which values shared responsibility for ongoing learning" obtained the highest computed weighted mean of 4.76 with a verbal interpretation of "very true of me". On the other hand, item "enjoy teaching in teams" yielded the lowest computed weighted mean of 3.89 with a verbal description of "true of me". The overall mean was

recorded at 4.28 which is verbally described as "very true of me".

The results imply that Science teachers are practicing peer teaching that fosters a trusting and open learning community in which mistakes are an accepted part of learning. Moreover, they believe that peer teaching provides opportunities for them to learn from and with each other on an ongoing basis. They can observe other teachers in action, engage in professional conversations about the impact of different approaches, and get feedback on their own teaching.

In the same vein, Raes (2018) stated that teachers engaged in discussions about the mathematics and science they teach, understood mathematics and science better, felt more prepared to teach mathematics and science, used more research-based methods for teaching, paid more attention to students' reasoning and understanding, and used more diverse modes of engaging students in problem solving.

In the conducted interview, teachers were asked about the importance of teaching each other among them. The respondents answered that teaching each other is important because there are instances wherein few of them were able to attend seminars in Science. Through teaching each other, those teachers who attended seminars can share the knowledge that they gained from it.

Sharing Resources

Sharing builds community. It develops connection and inspires creativity. The sharing of resources provides an ad hoc basis for professional development. At its simplest level this is through exposure to new ideas, content and methods. At a deeper level it comes through the immersion in a community of peers from whom a teacher learns.

Table 6. The Collegiality of the Public Secondary Science Teachers in terms of Sharing Resources

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. share materials related to Science teaching.	41	2	1	0	1	4.82	VT
2. often lend and borrow teaching and learning materials.	36	4	2	3	0	4.62	VT
3. share journal articles and educational books.	35	4	3	1	2	4.53	VT
4. find time to work on resources for the new curriculum	28	4	6	2	5	4.07	TM
5. contribute actively in making learning materials for online teaching.	24	6	4	6	5	3.84	TM
Overall Mean						4.38	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

The assessments of the public secondary school Science teachers about collegiality in terms of sharing resources are presented in Table 6.

From the table, the statement "share materials related to Science teaching" generated the highest computed weighted mean of 4.82 with a verbal interpretation of "very true of me". Meanwhile, the item "contribute actively in making learning materials for online teaching" garnered the lowest computed weighted mean of 3.84 with a verbal description of "true of me". The overall mean was recorded at 4.38 which is verbally interpreted as "very true of me".

The results imply that Science teachers value the spirit of sharing among them. Moreover, they firmly believe that sharing educational resources among Science teachers is an inevitable choice for the development of education.

In the same manner, Shen (2021) reiterated that the establishment of digital teaching resources sharing system can help universities establish long-term effective links, truly realize resource sharing, promote the healthy development of higher education, and better train and deliver high-standard talents for the society.

In the conducted interview with the Science teachers, they were asked about the importance of sharing of resources among them. The respondents replied that sharing of resources is very important for teachers like them because in doing this, they would be able to present their lessons in the best possible ways.

The Professional Identity of the Public Secondary Science Teachers

Professional identity is described as a group of understandings and notions concerning how people consider themselves as educators. Teacher professional identity is defined as the beliefs, values, and commitments an individual holds toward being a teacher.

The assessments of the public secondary school Science teachers with regard to their professional identity in terms of teaching beliefs, professional socialization, career progression and professional competence are manifested in Tables 7 to 10.

Teaching Beliefs

Teaching beliefs are implicit and explicit suppositions held by educators which have relevance for their professional and instructional practices, interactions with students, and learning processes. They may include beliefs about students, self, learning, knowledge, and knowing.

The assessments of the public secondary school Science teachers as regards professional identity in terms of teaching beliefs are presented in Table 7.

Table 7. The Professional Identity of the Public Secondary Science Teachers in terms of Teaching Beliefs

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. A good teacher should have a genuine interest in their students' well-being.	42	2	1	0	0	4.91	VT
2. A good teacher is one who can motivate students to learn.	40	2	2	1	0	4.80	VT
3. A good teacher has to be a subject matter expert.	44	0	1	0	0	4.96	VT
4. A good education should prepare students for lifelong learning.	26	5	6	3	5	3.98	TM
5. A good education should prepare students for life.	24	6	4	6	5	3.84	TM
Overall Mean						4.50	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

Seen from the table that item "A good teacher has to be a subject matter expert." obtained the highest computed weighted mean of 4.96 with a verbal interpretation of "very true of me". On the other hand, item "A good education should prepare students for life" received the lowest computed weighted mean of 3.84 with a verbal description of "true of me". The overall mean was registered at 4.50 which is verbally described as "very true of me".

The results imply that Science teachers are fully aware that their primary concern is the welfare of their respective students. Additionally, they are aware that they have the passion to teach, and they want their students to learn from their wealth of knowledge and experience.

Similar to the present findings, Magallanes et al., (2022) reported that the Philippine teachers are now generally more concerned about two things: the influence of the innovation on their students, and professional development especially through coordination with others. Teachers are eager to know whether their students can gain sufficient knowledge from their teachings, they comprehend and learn about the things in daily life the need for school assessment and for better educational output.

Professional Socialization

Professional socialization is the transition from marginal to full participation in a professional society. In any profession, training is the learning of knowledge and the related skills, while socialization combines this knowledge with the changed sense of oneself.

The assessments of the public secondary school Science teachers regarding their professional identity in terms of professional socialization are indicated in Table 8.

Table 8. The Professional Identity of the Public Secondary Science Teachers in terms of Professional Socialization

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. Being a member of the teaching profession is important to me.	45	0	0	0	0	5.00	VT
2. I participate in professional development/training courses/ conferences within and outside my institution.	44	1	0	0	0	4.98	VT
3. It is important for me to learn from other professional educators within and outside my institution.	42	2	1	0	0	4.91	VT
4. I can actively communicate with members of the teaching profession	33	4	5	2	1	4.47	VT
5. I share new teaching ideas/knowledge with colleagues	44	1	0	0	0	4.98	VT
Overall Mean						4.87	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

Apparently, all items indicated in the table including the computed overall mean of 4.87, yielded the highest verbal description of "very true of me". Alike with item "Being a member of the teaching profession is

important to me" registered the highest computed weighted mean of 5.00. On the other hand, item "I can actively communicate with members of the teaching profession" got the lowest computed weighted mean of 4.47.

The results imply that Science teachers firmly believe that joining professional organizations is not only important from a career development perspective, but it also provide new venture, excellent opportunities to network and meet new people.

In conformity with the present findings, Gokce (2020) asserted that teachers participate in the community of educators, and they learn how to be a member through the socialization process. They learn new skills, such as how to teach, and internalize new values, such as believing there will be cooperation among colleagues. They learn regulations and organizational contexts, while they develop a style of teaching. As a consequence, they construct a professional identity by internalizing values and norms of the profession and redefining it. This sometimes happens regardless of the school in their professional socialization process. Despite the many challenges inherent in the profession, teachers are expected to be socialized while performing their duties.

In the conducted interview with the Science teachers, they were asked about the importance of being a member of professional organizations. The teachers stated that it is very essential for them to become a member of any professional organization particularly those organizations which are related to Science. Further, through these organizations they are updated with the latest trends and techniques in teaching.

Career Progression

Career progression, is the process of climbing the ladder during the teachers' working life. Moving forward, being promoted, finding new challenges, new opportunities and getting the most out of their career.

The assessments of the public secondary school Science teachers about their professional identity in terms of career progression are reflected in Table 9.

Table 9. The Professional Identity of the Public Secondary Science Teachers in terms of Career Progression

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. I am proud to be a teacher.	45	0	0	0	0	5.00	VT
2. Pursuing a career in education is important to me.	45	0	0	0	0	5.00	VT
3. I am given job assignments which help me in my development as a teacher.	43	1	1	0	0	4.93	VT
4. There is a clear career track for teachers in my institution.	39	2	1	2	1	4.69	VT
5. My job as a teacher is well respected by the society at large.	44	1	0	0	0	4.98	VT
Overall Mean						4.92	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

Enumerated in the table including the computed overall mean of 4.92, registered the highest verbal description of "very true of me". Further perusal of the table reveals that items "I am proud to be a teacher" and "Pursuing a career in education is important to me" with the highest computed weighted mean of 5.00. On the other hand, item "There is a clear career track for teachers in my institution" got the lowest computed weighted mean of 4.69.

The results imply that Science teachers affirmed that teaching is a highly rewarding career that provides them with the opportunity and privilege to make a positive impact on the next generation.

In accordance to the findings of the present study, Celik (2017) noted that a career in education is a noble but rewarding endeavor that requires dedication and commitment. Teachers have always been at the core of education and their career development has always been the primary issue of education system. It is important to note that in order to make differences in students' achievement, teachers should empower their field knowledge and teaching skills.

In the conducted interview with the Science teachers, they were asked to describe their career as professional teacher. The respondents replied that they are contented their career now. Although they are looking and aspiring for higher teaching position, they say that they are proud of what they have.

Professional Competence

Professional competence means having requisite knowledge, skills, and abilities to provide quality services as defined by the technical and ethical standards of the profession. The expertise needed to undertake professional responsibilities and to serve the public interest. It means personal qualities formed on the basis of acquired knowledge and skills which contribute to initiative, teamwork and quality practicing of a profession according to the state educational requirements for acquiring qualification on a profession.

The assessments of the public secondary school Science teachers as regards their professional identity in

terms of professional competence are summarized in Table 10.

Table 10. The Professional Identity of the Public Secondary Science Teachers in terms of Professional Competence

Item Statement	Responses = 45					Mean	VD
	5	4	3	2	1		
1. I have sufficient knowledge about my teaching subject.	45	0	0	0	0	5.00	VT
2. I select appropriate teaching approaches to guide my students' learning.	45	0	0	0	0	5.00	VT
3. I use appropriate technologies (e.g., multimedia resources, games and simulation) to enhance my students' learning.	45	0	0	0	0	5.00	VT
4. I am able to help my students apply what they have learnt to real life situations.	41	2	1	1	0	4.84	VT
5. I support the diverse learning needs of my students.	44	1	0	0	0	4.98	VT
Overall Mean						4.96	VT

Legend:

Scale	Verbal Description
4.21 – 5.00	Very True of Me (VT)
3.41 – 4.20	True of me (TM)
2.61 – 3.40	Sometimes True of Me (STM)
1.81 – 2.60	Slightly True of Me (ST)
1.00 – 1.80	Not True of Me (NT)

Manifested in the table computed overall mean of 4.96. Further analysis of the table shows that item statements 1, 2, and 3 obtained the highest computed weighted mean of 5.00. Meanwhile, items 4 and 5 received the lowest computed weighted mean of 4.84. But, all of the items generated a verbal description of "very true of me".

These results imply that teacher respondents are very confident that they are equipped with adequate skills and knowledge to teach Science.

In the same vein, Park (2020) opined that professional competency can be distinguished from the typical notion of ability in that it denotes integrated capabilities that can be shown during task performance. Thus, it consists of cognitive, psychomotor, and affective aspects that are amalgamated in task performance. Furthermore, the concept of teacher competency is contextualized from various social and cultural perspectives on education.

In the conducted interview with the teachers, they were asked to describe their professional competence. The teachers replied that they are confident enough to say that they have the competence in teaching Science. Further, they added that they have the mastery of their subject matter and they have the capabilities in utilizing various strategies and methods in teaching the subject.

The Learning Outcomes of the Public Secondary Students in Science

The learning outcomes of the public secondary school students in Science are shown in Table 11.

Table 11. Distribution of Respondents According to Learning Outcomes

Grade	f (N=450)	Percent	Verbal Description
90 and above	90	20.00	Outstanding (O)
85 – 89	111	24.67	Very Satisfactory (VS)
80 – 84	130	28.89	Satisfactory (S)
75 – 79	119	26.44	Fairly Satisfactory (FS)
74 and below	0	0.00	Did Not Meet Expectations (DNE)
Range	75 – 96		
Mean	83.92		
Verbal Description	Satisfactory (S)		
Standard Deviation	5.85		

Manifested from the table that 28.89 percent obtained grades from 80 to 84 (satisfactory); 26.44 percent got grades from 75 to 79 (fairly satisfactory); 24.67 percent received grades from 85 to 89 (very satisfactory); and the remaining 20 percent registered grades from 90 and above (outstanding). Further examination of the table reveals that the grades of the students ranged from 75 to 96 with a mean and standard deviation of 83.92 (satisfactory) and 5.85, respectively.

The results imply that 306 students yielded grades that ranged from 78 to 90. Results showed that the grades of the students in Science are heterogeneous.

The Relationship between Collegiality of the Public Secondary Science Teachers and the Learning Outcomes of their Students

Table 12 exhibits the results of the correlation analysis which was done to determine if significant relationship existed between the collegiality of the public secondary science teachers and the learning outcomes of their students.

Table 12. Results of Correlation Analysis on the Relationship between Collegiality of the Public Secondary Science Teachers and the Learning Outcomes of their Students

Collegiality of Science Teachers	Learning Outcomes of Students
demonstrating mutual support and trust	0.561** (0.000)
joint planning and assessment	0.758** (0.000)
sharing ideas and expertise	0.769** (0.000)
teaching each other	0.563** (0.000)
sharing resources	0.713** (0.000)

Legend: ** = highly significant (p≤0.01)
Numbers in the upper entry are correlation values (r-values)
Numbers enclosed in parentheses are probability values (p-values)

Noted from the table that highly significant relationship was found between collegiality of the public secondary science teachers in terms of demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching each other, and sharing resources, and the learning outcomes of their students. This highly significant relationship was brought about by the fact that the computed probability value (p=0.000) for these variables is less than the 0.01 level of significance. Further perusal of the tabulated results reveals that direct relationship (as implied by the positive sign of the correlation values that ranged from 0.561 to 0.769) existed between the aforementioned variables. This indicates that as the level of collegiality of the public secondary science teachers increases, the learning outcomes of their students in Science also increases.

These results imply that when the students study in school where there is teachers' involvement with their peers on any level, be it intellectual, moral, political, social, and/or emotional, these students would be able to attain higher grades in Science.

In conjunction to the present findings, Gori (2020) reported that found in her study that collegiality had a positive relationship with academic performance in Science. All the sub-variables of collegiality were found to have a positive and significant relationship to pupils' academic performance in Science. The results are expected to shed light on how to improve provision of quality education in public primary schools, through the management of schools using collegial models.

In the conducted interview with the Science teachers, they were asked about the importance of collegiality among them in improving the grades of their students in Science. The teachers answered that when there is a strong collaboration among them, they would be able to present their lessons very well which will result to higher academic performance in the subject.

The Relationship between Professional Identity of the Public Secondary Science Teachers and the Learning Outcomes of their Students

Table 13 presents the results of the correlation analysis which was performed to determine if significant relationship existed between professional identity of the public secondary science teachers and the learning outcomes of their students.

Table 13. Results of Correlation Analysis on the Relationship between Professional Identity of Public Secondary Science Teachers and Learning Outcomes of their Students

Professional Identity of Teachers	Learning Outcomes of Students
teaching beliefs	0.688** (0.000)
professional socialization	0.654** (0.000)
career progression	0.514** (0.000)
professional competence	0.813** (0.000)

Legend: ** = highly significant (p≤0.01)
Numbers in the upper entry are correlation values (r-values)
Numbers enclosed in parentheses are probability values (p-values)

Reflected from the table that highly significant relationship was found between professional identity of the public secondary science teachers in terms of teaching beliefs, professional socialization, career progression, and professional competence, and the learning outcomes of their respective students.

This highly significant relationship is manifested by the computed probability value (p=0.000) for these variables which is lower than the 0.01 significance level. Further analysis of the tabulated results reveals that direct relationship (as implied by the positive sign of the correlation values that ranged from 0.514 to 0.813) between the aforementioned variables. This discloses that as the level of professional identity of the public secondary science teachers increases, the learning outcomes of their students in Science also increases.

The results imply that when the teacher successfully transmits to students the information, skills, and values that he or she finds relevant for teaching and learning, these students would be able to perform well in Science which eventually result to higher academic performance in the subject.

In conformity with the present findings, Wanderi (2020) found in her study that teachers' professional identity has a pivotal role to play in quality education outcomes. It is the teacher who constructs the pillars of

nation building in the form of students' development. It is the responsibility of teachers to train individuals' different aspects of personality. For effective teaching learning process, the competent teacher is considered as a key. The study recommends that school administration should make it possible to develop cooperation between parents and teachers for the sake of effective learning of students.

In the conducted interview with the Science teachers, they were asked about the importance of professional identity in improving their students' grades in Science. These teachers replied that when they have a clear understanding of their professional lives, career decision making, motivation, effectiveness, retention, professional development and their attitude toward educational change, they would be able to effectively deliver their lessons well which in turn result to higher academic performance of their students.

Table 14: Thematic Analysis: Summary Table of the Interview Transcript

Guide Questions	Responses
1. How do you demonstrate mutual support and trust to your colleagues?	The Science teachers answered that in their school they always support each other. Whenever their co-teachers have problems, they are always there to comfort and offer whatever help they could extend. Further, they said that in their school they are like family where everyone respect and trust each other.
2. How important is teaching each other among Science teachers?	Respondents answered that teaching each other is important because there are some instances wherein only some of them were able to attend seminars in Science. Through teaching each other, those teachers who attended seminars were able to share the knowledge that they gained from it.
3. How important is sharing of resources among teachers?	They replied that sharing of resources is very important for teachers like them because in doing this, they would be able to present their lessons in the best possible ways.
4. How important for you is membership of professional organization?	The teachers stated that it is very important for them to become a member of any professional organization especially those organizations which are related to Science. Further, they added that through these organizations they would be able to make themselves updated of the latest trends and techniques in teaching.
5. Describe your career as a Science teacher.	The respondents replied that they are contented of their career now. Although they are looking and aspiring for higher teaching position, they can still say that they are proud of what they are and what they have.
6. Describe your professional competence as Science teacher.	The respondents replied that they are confident enough to say that they have the competence in teaching Science. Further, they added that they have the mastery of their subject matter and they have the capabilities in utilizing various strategies and methods in teaching the subject.
7. How important is collegiality among teachers in your students'	The teachers answered that when there is a strong collaboration among them, they would be able to present their lessons very well

Intervention/s or Programs of Activities Crafted based on the Result of the Study

Science teachers' collegiality and professional identity of the public secondary Science teachers significantly affect the learning outcomes of the learners. In cognizance thereof, when the Science teachers build a harmonious working relationship among colleagues, learners would be able to perform better in Science.

Findings of the study reflect Science teachers' challenges in sharing ideas and expertise, and teaching each other yielded lowest assessments. Hence, the researcher offers the Program of Activities presented in Table 15.

Table 15: Proposed Program of Activities based on the Result of the Study

Objective	Activity	Time Frame	Person/s Involved	Expected Outcome
To update and develop teachers' knowledge, skills, and abilities in teaching Science	Conduct of regular meetings in the Science Department to discuss and process new information about the subject area.	Every end of the month of S.Y. 2022-2023	Principal or School Head; Head Teacher in Science; Master Teacher; Science Teachers	Science teachers are updated with new knowledge and skills by sharing of ideas and expertise suitable to the demands and needs of their learners.
To create opportunities for Science teachers to conduct demonstration teaching and see the new strategies in action.	Demonstration teaching using new strategies in teaching Science Subject and an open forum afterwards.	Every end of the quarter of S.Y. 2022-2023	Principal or School Head; Head Teacher in Science; Master Teacher; Science Teachers	Science teachers can discuss and process new teaching strategies bringing out quality education to learners.
To equip teachers with knowledge, skills, and attitudes on the Science Subject where they can improve their professional identity.	Conduct of trainings and seminars that provides knowledge or skills by sharing of ideas and expertise with each other.	S.Y. 2022-2023	Principal or School Head; Head Teacher in Science; Master Teacher; Science Teachers	Personal development and professional growth continuously strives to groom Science teachers to perform outstandingly.
To revisit School-based professional development goals in teaching Science subject.	Conduct of seminar/workshop on Science teachers	Beginning of the S.Y. 2023-2024	Principal or School Head; Head Teacher in Science; Master Teacher; Science Teachers	Science teachers' awareness of the goals set for the whole school year. It must be referenced on a regular basis.
To monitor the effectiveness of Science teachers' in teaching each other	Use student data and teacher evaluations to see whether changes are having an effect on student achievement.	Every end of the quarter of S.Y. 2022-2023	Principal or School Head; Head Teacher in Science; Master Teacher; Science Teachers; Learners	Science teachers' collaborative working relationships can help students to be more productive and may perform better in Science which in turn can improve students' motivation, interest, and engagement in learning.
To create a Science Collaborative Action Team that supports the improvement of learners' achievement through the collaborative efforts of Science teachers	Design program and evaluation plan, and determine goals to provide mentoring and teaching assistance to improve student achievement	Every end of the quarter of S.Y. 2022-2023	EPS in Science; Principal or School Head; Head Teacher in Science; Master Teacher; Science Teachers; Learners	The collaborative working relationships of the Science teachers help to strengthen the low-performing learners' knowledge and skills.

CHAPTER IV

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of the major findings, the conclusions arrived at based on the findings, and the recommendations given in accordance with the conclusions.

Findings

This study determined the influence of teachers' collegiality and professional identity on the Science learning outcomes of students in public secondary schools in San Luis, Pampanga during the School Year 2022-2023.

Using the procedures described in the preceding chapter, the answers to the problems raised in this study were ascertained and summarized as follows: Findings revealed that Science teachers assessed collegiality in terms of demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching each other and sharing resources as very true in their respective schools. The scope of collegiality covers trust, teamwork, and resource sharing. This study defines trust as having confidence in one's colleagues to complete collaborative work projects without the need to oversee the details of the process. It is also the belief in having confidence in stating one's professional opinions without being judged. Moreover, teamwork is defined as the collaborative team effort toward the achievement of common occupational goals that may enhance job satisfaction (Atmaca, C.; Rızaoglu, F.; Türkdogan, T.; Yayli, D, 2020)

In similar vein, these teachers assessed professional identity in terms of teaching beliefs, professional socialization, career progression and professional competence as very true of them. A teacher's professional identity and their sense of competence are crucially involved in determining the commitment they have to their careers, which also links with their sense of identity and, consequently, well-being (Skinner et al., 2021)

The learning outcomes of the public secondary students in Science were described as "satisfactory".

Highly significant relationship was found between collegiality of the public secondary science teachers in terms of demonstrating mutual support and trust, joint planning and assessment, sharing ideas and expertise, teaching each other, and sharing resources, and the learning outcomes of their students.

Likewise, highly significant relationship was found between professional identity of the public secondary science teachers in terms of teaching beliefs, professional socialization, career progression, and professional competence, and the learning outcomes of their respective students.

Conclusions

Based on the findings of the study, these conclusions were drawn: There is a significant relationship between the collegiality and professional identity of the public secondary Science teachers and the learning outcomes of their students in Science. The harmonious relationship among teachers could positively influence the students' learning outcomes in Science.

Recommendations

In light of the findings and conclusions of the study, the following recommendations are hereby offered:

1. The study considers the "Intervention/s or Programs of Activities Crafted based on the Result of the Study," to be implemented.
2. Science teachers may allot time for constant meeting even once a month wherein one teacher may be assigned to conduct demonstration teaching. After the demo, open forum can follow so that there will be a practice of peer teaching and engagement of professional conversation.
3. School administrators may conduct effective mechanisms such as trainings and seminars that provides knowledge and skills to the Science teachers by sharing of ideas and expertise with each other.
4. Create a Science Collaborative Action Team that supports the improvement of learners' achievement through the collaborative efforts of Science teachers.
5. The study recommends that school administration should make it possible to develop cooperation between parents and teachers for the sake of effective learning of students.
6. For future researchers, further research along this line could be conducted. The same study may be conducted to senior high school to further validate and understand the significance of collegiality and professional identity on learning performance of the students not only in Science but in all subjects as well.

REFERENCES

Alkhannani, B. M. (2021). The effectiveness of collaborative teaching and learning and engaging students as partners on English language teaching in Saudi Arabia. *Theory and Practice in Language Studies*, *11*(10), 1288–1294.

Atmaca, C.; Rızaoglu, F.; Türkdogan, T.; Yayli, D. An emotion focused approach in predicting teacher burnout and job satisfaction.Teach. Teach. Educ. 2020, 90, 103025.

Bolten, W. (2020). The Importance of Teacher Collaboration. *J. Educ. Res*. 7, 29–46

Celik, B. (2017). Career Development of Teachers: Importance and Benefits. *International Journal of Social Sciences & Educational Studies,* Vol.4, No.1, pp. 130-135.

Creswell, J. W., & Creswell, D. J. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications, Inc.

Goh, K. (2016). Assessing teachers' professional identity in a postsecondary institution.
The Online Journal of New Horizons in Education, 6(4), 38-51.

Gokce, AT. (2020). Professional Socialization in Schools. *Educational Research Journal*, 32(4), 101–116.

Gori, JM. (2020). Relationship between Teachers' Collegiality and Academic Performance of Pupils. *f International Journal of Research Publications (IJRP.ORG)*, 65(1), 125-140; doi:.10.47119/IJRP1006511120201580.

Heled, E., & Davidovich, N. (2019). The impact of academic, personal, and professional attributes on the occupational identity of school counselors in Israel. *International Journal of Educational Methodology*, *5*(4), 513–523. https://doi.org/10.12973/ijem.5.4.513

Ivanova, I., & Skara-MincĿne, R. (2016). Development of professional identity during teacher's practice. *Procedia - Social and Behavioral Sciences, 232*, 529–536. https://doi.org/10.1016/j.sbspro.2016.10.073

Joseph, I., & Atweh, B. (2019). Collaboration: A collective bargain for achieving quality mathematics classroom practice. *International Journal of Educational Methodology*, *5*(3), 347–361. https://doi.org/10.12973/ijem.5.3.347

Kolleck N (2019). Motivational Aspects of Teacher Collaboration. *Frontiers* 4(122). doi: 10.3389/feduc.2019.00122

Löfgren, M. Karlsson (2016). Emotional Aspects Of Teacher Collegiality: A Narrative Approach.https://lofgren+%26+karlsson+2016collegiality&hl=en&as_sdt=0&as

Mofrad, E. Z. (2016). Exploring the professional identity of the Iranian English teachers: The case of English institutes of Iranshahr. *Theory and Practice in Language Studies*, *6*(4), 843. https://doi.org/10.17507/tpls.0604.23

Ormerod,R.J.(2020) Pragmatism In Professional Practice https://onlinelibrary.wiley.com/doi/full/10.1002/sres.2739

Park, J. (2020). Teacher Competency in Competency-Focused Science Teaching in the South Korean Context: Teacher Self-Assessment Instrument Development and Application. *Asia-Pacific Science Education*, 6 (2), 480–513

Raes, E. (2018). Collaboration among teachers: A systematic review. *Educational Research Review* 1(5), 17–40.

Shah, M. (2016). The importance and benefits of teacher collegiality in schools – a literature review. *Procedia - Social and Behavioral Sciences*, *46*, 1242–1246. https://doi.org/10.1016/j.sbspro.2012.05.282

Shen, D. (2021). Research on the sharing mode of educational information resources in colleges and universities based on the Blockchain and new energy. *Energy Reports*, Volume 7, Supplement 7, November 2021, Pages 458-467.

Singha, S. V., & Sikdar, D. P. (2018). Professional development of teacher and professionalism in teacher education. *International Journal of Applied Social Science, 5*(8), 1320–1332.

Skinner, B., Leavey, G., and Rothi, D. (2021). Managerialism and teacher professional identity: impact on well-being among teachers in the UK. Educ. Rev. 73, 1–16. doi: 10.1080/00131911.2018.1556205

Swierczek, A. (2019), "Manufacturer structural embeddedness and the network rent: the intervening role of relational embeddedness in the triadic supply chains", *Supply Chain Management*, Vol. 24 No. 3, pp. 334-354. https://doi.org/10.1108/SCM-06- 2018-0232

Tamooh S. and Gori, J. (2020). Relationship between Teachers' Collegiality and Academic Performance of Students. *International Journal of Research Publications*, 65(1), 125-140.

Valverde-Berrocoso, J., Garrido-Arroyo, M. D. C., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-Learning: A systematic literature review (2009–2018). *Sustainability*, *12*(12), 5153. https://doi.org/10.3390/su12125153

Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2015). Teacher collaboration: A systematic review. *Educational Research Review*, *15*, 17–40. https://doi.org/10.1016/j.edurev.2015.04.002

Wanderi, A. (2020). Teachers Professional Identity and its Influence on Quality Educational Outcomes. *Journal Of Education,* Volume 5, Number 1, 2-13.

Yazdani, H., & Ghasedi, P. (2021). Efficacy of EFL teachers' assessment literacy and professional identity in boosting learners' autonomy. *Journal of Language Teaching and Research*, *12*(3), 395–403. https://doi.org/10.17507/jltr.1203.09