International Journal of Research Publication and Reviews

Pedagogical Soft Skills of Science Teachers in Post-Pandemic Science Education

Jeremy DC. Domingo[1], Raymond S. Manalastas[2]

[1]DepEd SDO Bulacan/Bulacan Agricultural State College
[2]PhD, DepEd SDO Pampanga/ Bulacan Agricultural State College

ABSTRACT

The challenging situation of today's society, characterized by the consequences of the COVID-19 pandemic, has forced many changes in the educational environment. Human development and learning have proliferated, opening opportunities to shape more effective educational practices. While many educators have recognized the importance of students having soft skills, they have also acknowledged that these skills are often challenging to teach in a formal classroom setting. Integrating people skills into educating teachers is more important to the profession's success. To address this issue, the researcher aims to determine the soft skills of science teachers and the components of soft skills integrated into science learning needed in learning following the objectives of 21st-century science education. The study utilized a mixed-methods research design to provide comprehensive information about the problem. The results of the study were analyzed using mean and standard deviation and content analysis to interpret the gathered qualitative data. Based on the research analysis, the teachers' understanding of soft skills is established, and they currently practice the soft skill aspects such as positive attitude, communication skills, adaptability skills, time and energy management, work ethics, problem-solving and analytical skills, and teamwork-leadership skills. Moreover, soft skills are "highly preferred" to be used by most of the participants in teaching science. Furthermore, teacher participants' experience with the importance of soft skills in teaching science led to the emergence of three unifying themes, such as: 1) soft skills are essential in developing the best outcomes; 2) soft skills enhance students' collaboration in the learning process; and 3) soft skills connect teachers with learners. Teachers integrate soft skills in their science class, with three themes emerging: 1) integration in the collaborative activities; 2) integration in planning the lesson; and 3) integration in the lesson proper.

Introduction

The challenging situation of today's society, characterized by the consequences of the COVID-19 pandemic, has forced many changes in the educational environment. It has forced significant adjustments in the work processes of companies and institutions (Antón-Sancho et al., 2021). Academic sectors have become more complex and competitive to adapt to societal changes (Lavilles & Robles, 2017). Teachers must develop skills appropriate for their teaching work (Monteiro & Leite, 2020), and the standards for 21st-century teachers have become even more dynamic due to the demands of the educational system to evolve and increase their level of performance.

Human development and learning have proliferated, opening opportunities to shape more effective educational practices. The 2011 Framework for Philippine Science Teacher Education of the Science Education Institute of the Department of Science and Technology (SEI-DOST) presented the qualities of effective science teachers in terms of what they should know (knowledge), what they expected to do to achieve quality learning outcomes (practice), and what they should possess to be able to embrace change and sustain professional growth (attributes). All these are anchored on raising the country's science education quality. Moreover, Pietro & Altomari (2019) describe that the continuous production of information and, at the same time, the sharing of knowledge have caused significant changes both in the socio-economic sector and in the cultural sector, as well as in the educational and training environments.

Twenty-first-century education requires the wide-ranging knowledge and skills of teachers, which are critically crucial to a school's success. The value of soft skills has become a trend (Lavilles & Robles, 2017). Most science teachers encounter professional career challenges requiring soft skills. Patacsil and Tablatin (2017) argue that soft skills should be incorporated into academic programs. The United Nations Children's Fund (2012) stated that soft skills, specifically interpersonal and psychological, assist individuals with effective communication and informed decision-making, as well as developing the self-management and coping skills required for general well-being and a good quality of life.

Hurrell (2009) defines *soft skills* as 'involving interpersonal and intrapersonal abilities to facilitate mastered performance in particular contexts.' The European Centre for the Development of Vocational Training (CEDEFOP) in 2006 explains that soft skills are context-dependent and attained from abstract and implied knowledge with experience and one's reflection. Soft skills are also known by various other names: transferable skills, basic skills, core skills, generic skills, essential skills, employability skills (Tran, 2013), functional skills (Brolin & Loyd, 2004), 21st century skills, life skills, career skills, social-emotional skills (Kamenetz, 2015), and thinking disposition (Claxton, Costa, & Kallick, 2016). Moreover, soft skills are a set of skills of

fundamental importance in work activities (Pachauri & Yadav, 2014); they are not technical or specific skills but are strongly linked to personal qualities and attitudes and to social and management skills. Due to their intangibility, Dall'Amico (2016) explained that some of them are difficult to recognize, quantify, evaluate, and develop. The acquisition of these skills for teachers is essential to dealing with different contextual situations successfully (Schulz, 2008), and the soft skills are necessary to interpret and understand complex conditions as well as to design training courses that enhance the personal qualities of the students (Ngang et al., 2015).

While many educators have recognized the importance of students having soft skills, they have also acknowledged that these skills are often challenging to teach in a formal classroom setting (Murphy et al., 2014). Karras (2022) has pointed out that integrating people's skills into educating teachers is more important to the profession's success. Snape (2017) reiterates that significant change in education policy and curriculum is a high-stakes matter. Schools must ensure they prepare their learners for what they will confront in life and instill a thirst for lifelong and expansive learning. Such an approach will require changing more effective teaching and learning pedagogies, student engagement, and assessment practices. Furthermore, other researchers have found that soft skills enhance constructive and positive personal development (Sandhu, 2014), self-esteem, and mental health (Rahmanpour, Teimori, & Momeni Mehmooee, 2011; Sajedi, Attashpour, Kamkar, & Samsam, 2009), and critical-thinking skills (Dixon, Cassady, Cross, & Williams, 2005; Moore, 2004) among students.

From a broader perspective, de Campos et al. (2020) believe that still little effort has been conducted to connect the pieces and understand which soft skills have a more substantial impact on each career or field, especially in those fields in STEM (Science, Technology, Engineering, and Mathematics). The Programme for International Student Assessment (PISA) 2018 reports that 86% of students in the Philippines (Organization for Economic Cooperation and Development (OECD) average: 74%) agreed or strongly agreed that their teacher enjoys teaching. Students' reading scores were higher when they perceived their teacher as more enthusiastic, especially when their teachers were interested in the subject. It is aligned significantly with the aim of PISA in equipping citizens with the knowledge and skills necessary to achieve their full potential, contributing to an increasingly interconnected world, and bringing better skills into better lives, which needs to become a more central preoccupation of policymakers worldwide. In working to achieve these goals, more and more countries are looking beyond their borders for evidence of the most successful and efficient education policies and practices. PISA is the world's most comprehensive and reliable indicator of students' capabilities and a powerful tool that countries and economies can use to fine-tune their education policies.

According to Hattie (2003), professionally qualified teachers with the appropriate soft skills influence students' interest and commitment to achieve their educational success quickly. However, in practice, at this time, teachers need to understand the components of soft skills associated with science learning activities. Based on the gathered information, the researcher feels the need to explore the understanding of science teachers in soft skills, the components of soft skills needed by science teachers in learning, the soft skill development methods applied by science teachers, and their importance for the students. The results of this study are expected to be input for teachers to integrate the components of soft skills needed in learning, following the objectives of 21st-century science education.

Statement of the Problem

This study aims to determine the soft skills of science teachers and the components of soft skills needed in science learning in a selected school in Marilao, Bulacan, during the school year 2022–2023. The results of this study are expected to be input for teachers to integrate the components of soft skills needed in learning, following the objectives of 21st-century science education.

Specifically, it will seek answers to the following questions:

1. How do the science teachers describe their level of understanding of soft skills in terms of:

    1.1. Positive Attitude

    1.2. Communication Skills

    1.3. Adaptability

    1.4. Time and Energy Management

    1.5. Work Ethics

    1.6. Problem-Solving and Analytical Skills

    1.7. Teamwork and Leadership Skills

2. What are the teachers' preferred soft skills needed in teaching science?

3. What are the views and insights of science teachers toward the importance of soft skills?

4. How do science teachers integrate soft skills in teaching science?

Conceptual Framework

Teachers in this complex and ubiquitous society (Bauman, 2011, as cited in Pietro & Altomari, 2019) are faced with daily challenges that see them engaged with the problems of the learners, in conjunction with the planning and execution of the lesson plan as well as the requests of the parents (Brewster & Railsback, 2001). Teachers with transversal skills can manage these challenges, not just technical skills. This is important for ensuring teachers manage their daily work in challenging conditions. Therefore, the relationship between teachers' skills and teaching quality is an important and exciting topic to investigate (Ngang et al., 2014).

Teaching is a noble profession that shapes the future citizens of society by shaping students' character, caliber, and future. Like other professionals, teachers have hard skills. Teaching and learning hard skills are more accessible with a common entrance standard, uniform syllabus, and evaluation system. However, developing soft skills, specifically ethics, morals, and professional skills, amongst teacher trainees remains challenging as it involves less measurable elements and varies highly with each individual according to their character and background (Shakir, 2009). Jazeel (2016) argues that "soft skills for teachers" is an important theme discoursed in various quarters. However, the pertinent question is how far soft skills are absorbed into the teaching profession. This situation has caused concern worldwide, and the need for soft skills is necessary for teachers and should be included in teacher education and teacher development programs. Soft skill research is beneficial and necessary since one of the issues that needs to be resolved is how 21st-century knowledge and abilities may be adequately integrated into educator preparation.

In the 21st century, many of the activities carried out by society have transformed, mainly due to the continuous change to which they are subjected. Proof of this are the demands generated in the educational and professional worlds due to the increased importance of soft skills or transversal competencies (Antón-Sancho, 2021).

The way science teachers view soft skills reflects a variety of phenomena related to the development of soft skills. Teachers understand the function and virtue of soft skills for students, but they also need to understand the application of soft skills in science learning. Most science teachers believe soft skills are necessary to promote students' achievements, character, personality, religion, and attitude in interacting with people in the social community (Susilawati et al., 2020). Teaching soft skills is much more art than science (Onabamiro et al., 2014). According to Ngang and Chan (2015), teachers, educators, and researchers require a better understanding of soft skills. Proper soft skills are vital for successful work and social interactions in society. First and foremost, there is a need to understand the meaning and principles of soft skills.

Seven components of soft skills are needed in science learning, as adapted from the Understand My Journey (UMJ) Toolkit for Soft Skills Development for Young People (2018). The attributes are a positive attitude, communication skills, adaptability, time and energy management, work ethics, problem-solving and analytical skills, and teamwork and leadership skills.

Positive thinking is defined by Sasson (n.d.) as an optimistic outlook on life and a positive mental and emotional attitude that anticipates favorable outcomes. According to Cherry (2017B), adopting a positive mindset can help you face life's obstacles head-on. It comprises attempting to see the best in other people, making the most of potentially detrimental events, and having a positive self-image and confidence in your abilities—rather than necessarily avoiding or dismissing the terrible things.

Developing a genuinely positive mindset and gaining these benefits is a function of the thoughts that teachers must cultivate. Conversely, optimistic thoughts and feelings "broaden and build" our abilities and resources and allow us to see new possibilities (Fredrickson, 2004). Aside from enhancing abilities and personal resources, cultivating a positive mindset has many other benefits, including better overall health, better coping with stress, and greater well-being (Cherry, 2017A).

In education, Main (2010) found that teachers' isolation is one of the hurdles that hinder the achievement of the goals and objectives of the school. Thus, he identified that collaboration with other teachers is a key strategy for better job performance. However, Crutchfield and Kimberly (2014) highlighted that those team members who are identified as free-riders and rely on high-performing team members are the pitfalls of teamwork in the organization. This system creates a disproportionate burden on active and dynamic members. In the classroom setting, Maldonado and Elizabeth (2011) posited that teamwork creates a strong rapport between learners and teachers and promotes the positive development of the students through improved academic skills and diminished behavioral problems.

On the other hand, Puccio et al. (2010) highlighted that leadership skills comprise various criteria that benefit the organization. Leaders create a connection with their subordinates. They also understand the diversity in the workplace and empower the potential of others through the creative process. Similarly, Bhatnagar (2011) emphasized that leadership skills involve motivating and assisting others in reaching their innate capacities and devising visions for the organization. Marques (2013) stressed that future leaders should strengthen their leadership skills to be efficient. He also identified motivation, empathy, self-awareness, and regulation as factors of effective leadership. According to Tang et al. (2013), administrators who possess strong leadership qualities are better able to win over their subordinates' trust and support. Helterbran (2010) stressed that teachers have always been leaders. Teacher leadership is becoming more significant today. Leadership requires vision, education, and efforts to achieve and accomplish (Ludlow, 2011).

From the theory, related studies, and literature cited, presented, and explained above, the researcher came up with the paradigm that will serve as a guide in the conduct of the study.

Figure 1 shows that the independent variable is the science teachers' understanding of soft skills. This variable was hypothesized to influence (as implied by the arrowhead) the dependent variables, which are the science teachers' perceived importance and their integration of soft skills in teaching science.

Soft skills are described as a positive attitude, communication skills, adaptability, time and energy management, work ethics, problem-solving and analytical skills, and teamwork and leadership skills. On the other hand, this study's dependent variable is the perceived importance and integration of soft skills in teaching science.
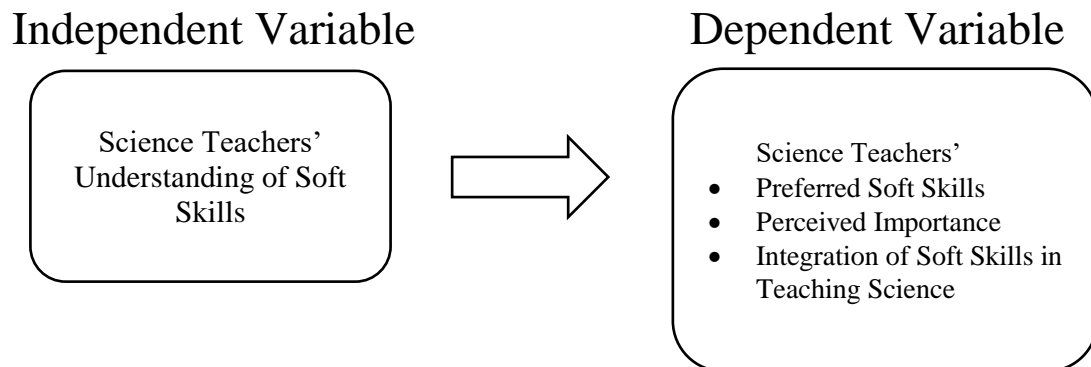
Independent Variable   Dependent Variable

Science Teachers' Understanding of Soft Skills

Science Teachers'
- Preferred Soft Skills
- Perceived Importance
- Integration of Soft Skills in Teaching Science

Figure 1. The Paradigm of the Study

Materials and Methods

Research Design

This study utilized a mixed-methods research design. It is a combination of quantitative and qualitative research in a single study. The researcher will also use the descriptive-normative survey design to determine the science teachers' understanding of soft skills and a descriptive-case study to describe the importance and integration of soft skills in teaching science.

Shorten and Smith (2017) explained that mixed-methods research draws on the potential strengths of both qualitative and quantitative methods, allowing researchers to explore diverse perspectives and uncover relationships between the intricate layers of multifaceted research questions. On the other hand, Writer (2020) discussed that a descriptive-normative survey combines two research techniques: obtaining data to describe the subject of study as it is, has been, or is seen (the descriptive method) and analyzing the subject to find improvements (the normative method). Moreover, Yin (2014) explained a descriptive-case study that describes a phenomenon in its real-world context. Furthermore, case study and mixed methods research are not separate entities; instead, the boundary between them is permeable and fluid, allowing each to either support or lead a research endeavor (Carolan, Forbat, & Smith, 2016).

Studies begin with quantitative data collection and analysis, then identify quantitative outcomes that require a comprehensive explanation to build a qualitative technique. In this study, the researcher will create qualitative questions, methodology, and data collection techniques after finishing the first stage of the study. The researcher interprets the ways in which the preliminary quantitative results can be explained by the qualitative findings.

Data Gathering Techniques

Before submitting the request letter to the division office of Bulacan, the researcher completed all the requirements set by the said office. Moreover, the researcher ensured that ethical considerations were observed appropriately while collecting the quantitative and qualitative data needed for the study. It has also been ensured that no classes were disrupted during the administration of questionnaires or the conduct of interviews. A consent form was included in the questionnaire to ensure that all participants have the right to participate willingly in this study. Moreover, the respondents were allowed to withdraw and refrain from answering the survey questionnaire and the interview questions whenever they felt uncomfortable doing them. The respondents ensured that all data collected was treated with the utmost confidentiality. After a week of distribution, the results were extracted and evaluated. Further, they were informed that all data that has been gathered from them was used solely for research purposes, and assurance was given to them that after passing the final defense, which may happen sometime in June 2023, all the collected data will be permanently deleted from the researcher's laptop or any electronic storage.

Upon completing all the needed documents, the researchers sought an approval letter from the school superintendent to conduct a research survey among junior high and senior high school science teachers at Assemblywoman Felicita G. Bernardino Memorial Trade School in Lias, Marilao, Bulacan. Once approved, the researcher coordinated with the principal of the school respondents for the schedule of quantitative and qualitative data collection.

The researcher relied heavily on a combination of closed-ended and open-ended survey questionnaires to gather information from the respondents. The instrument was adapted and modified from the "Understanding My Journey Toolkit" (2020) to assess the science teachers' understanding of soft skills.

The tool was divided into four parts. A consent form that asked for permission to participate in the study was the preliminary part of the questionnaire, followed by the personal data sheet that focused on the respondents' profiles, including age, sex, and length of service. The second part is quantitative and concentrates on twenty statements (20) about the common determiners of soft skills, and the science teachers assessed their understanding based on this. Modifications were made to fit the study. It included five-point response scales using Likert-type scales:

Scale	Rating	Interval
5	Always	4.20 – 5.00
4	Often	3.40 – 4.19
3	Sometimes	2.60 – 3.39
2	Rarely	1.80 – 2.59
1	Never	1.00 – 1.79

A counter-scale will be used to interpret the level of understanding of soft skills with the following scale:

Rating	Interval
Established	3.68 – 5.00
Consolidating	2.34 – 3.67
Emerging	1.00 – 2.33

The third part contains teachers perceived soft skills needed in teaching science with the following scales:

Scale	Rating	Interval
4	Highly Preferred	3.50 – 4.00
3	Moderately Preferred	2.50 – 3.49
2	Slightly Preferred	1.50 – 2.49
1	Not Preferred	1.00 – 1.49

Meanwhile, the last part of the questionnaire is a semi-structured interview that was conducted to collect qualitative data. The researcher formulated open-ended questions with the guidance of his adviser. These questions were asked of selected respondents in the interview with the primary purpose of soliciting their views and insights about the importance of soft skills and their integration into science teaching. The gathered data from this phase was used to validate and further support the quantitative results of the study.

Sampling Procedures

In this study, purposive sampling was employed in choosing the teacher participants. According to Robinson (2014), purposive sampling is an intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon.

A total of thirty-four (34) teacher participants are included in this study. Twenty-seven (27) are from the junior high school department, while seven are from the senior high school department.

Table 1. Distribution of Respondents of the Study

	Science Teachers	
	Junior High School	Senior High School
Male	9	3
Female	18	4
Total	27	7

Data Analysis Scheme

After collecting all the questionnaires needed for the quantitative phase of the study, the results were organized, tallied, tabulated, and analyzed using some statistical tools.

This study utilized descriptive statistics such as frequency count, percent, weighted mean, and standard deviation to calculate and summarize the descriptive measure of the given variable.

To analyze the collected data, frequency and percentage were used to determine the profile of the respondents. The mean and standard deviation were computed to describe the science teachers' understanding of soft skills. The standard deviation was used to determine the homogeneity or heterogeneity of the collected data.

For the interpretation of the gathered qualitative data, content analysis was utilized. Content analysis is a research tool used to determine the presence of certain words, themes, or concepts within some given qualitative data (i.e., text). A research technique called content analysis is used to find specific words, themes, or concepts in a given set of qualitative data or text (Elo et al., 2014).

Results and Discussions

The Teachers' Soft Skills

Table 2.

Level of Understanding of Soft Skills

Soft Skills	Mean	SD	Verbal Interpretation
Positive Attitude	4.37	0.448	Established
Communication Skills	3.94	0.502	Established
Adaptability Skills	4.52	1.844	Established
Time and Energy Management	3.90	0.595	Established
Work Ethics	4.27	0.353	Established
Problem-Solving and Analytical Skills	4.07	0.640	Established
Teamwork-Leadership Skills	4.12	0.508	Established
Overall	4.17	0.474	Established

Legend:

Scale	Verbal Description
3.68 – 5.00	Established
2.34 – 3.67	Consolidating
1.00 – 2.33	Emerging

Table 2 presents the assessment of the teacher's level of understanding of soft skills. Unanimously, teachers' soft skills are all established, and they currently practice the soft skill aspects with an overall mean score of 4.17. Adaptability acquired the highest mean of 4.52, while time and energy management acquired the lowest mean of 3.90.

Schulz (2008) describes soft skills that fulfill an important role in shaping an individual's personality. Developing sufficient abilities beyond academic or technical knowledge is critical for all students. These skills are personal competencies that are useful across most professions, including teaching. The relationship that teachers develop with their students is at the heart of their soft skills. Soft skills are intrapersonal and interpersonal skills that equip teachers to develop their personalities, enhance social participation, and contribute to workplace success (Macqual, Salleh, & Zulnaidi, 2021).

Mellona (2022) defines teachers' adaptability skills as how they adjust their thoughts, actions, and emotions as responses to varying situations. This finding implies that teachers are open to innovative ideas, experience new things, and can self-learn and overcome setbacks. In accordance with this, teachers must adapt to changing, new, and uncertain situations to navigate them successfully. Adapting may entail changing the pace of a lesson to engage students better, reducing frustration when a lesson does not go as planned, or changing one's approach to collaboration to work well with a new colleague (Collie, Martin, & Granziera, 2018). In the current situation of teachers, Munda (2021) stated that teachers are dealing with a variety of work-related changes, including preparing and submitting various reports to superiors, attending webinars, preparing lessons and presentations, and teaching students from various learning modalities, communicating with learners, parents and guardians, and others. Thus, teachers must be adaptive to the activities and rapid changes in the workplace.

Preferred Soft Skills

Table 3**.**

Preferred Soft Skills in Teaching Science

Soft Skills	Mean	SD	Verbal Interpretation
Positive Attitude	3.52	0.570	Highly Preferred
Communication Skills	3.42	0.564	Moderately Preferred
Adaptability Skills	3.52	0.508	Highly Preferred
Time and Energy Management	3.52	0.570	Highly Preferred
Work Ethics	3.55	0.564	Highly Preferred
Problem-Solving and Analytical Skills	3.58	0.564	Highly Preferred
Teamwork-Leadership Skills	3.48	0.570	Moderately Preferred
Overall	3.52	0.442	Highly Preferred

Legend:

Scale	Verbal Description
3.50 – 4.00	Highly Preferred
2.50 – 3.49	Moderately Preferred
1.50 – 2.49	Slightly Preferred
1.00 – 1.49	Not Preferred

It can be gleaned from Table 3 that soft skills are "highly preferred" to use by most of the participants in teaching science, with an overall mean of 3.52. Problem-Solving and Analytical Skills garnered the highest mean score of 3.58 and a verbal interpretation of "highly preferred." On the other hand, communication skills garnered the lowest mean score of 3.42 and a verbal interpretation of moderately preferred use in teaching science.

In line with the findings, problem-solving and analytical skills refer to a soft skill, which is the ability to handle difficult or unexpected situations in the workplace. Teachers who often use the problem-solving approach highlight investigation in education, particularly how this helps inculcate imaginative and scientific thinking skills (Demirel, 1998, as cited in Otacioglu, 2008). When teaching science, teachers should base their lessons on current, relevant topics that pique students' curiosity. This approach encourages students to take a more active role in figuring out how natural events work instead of being taught those lessons by an instructor (Sharma, 2021). This can be done by gathering data-driven evidence to inform decisions about developing instructional materials to improve the teaching-learning process.

On the other hand, Mellano (2022) describes communication skills as when teachers' effectiveness in delivering educational outcomes depends on how efficiently they utilize the macro skills of communication, namely listening, speaking, reading, and writing. This involves sharing experiences and ideas through spoken words, graphs, diagrams, models, or tables. This science process skill is developed through implementing the science process in day-to-day communication, especially during class discussions and presentations.

This finding implies that teachers create a supportive and safe environment where students feel comfortable opening and expressing their ideas and thoughts. In addition, Capulong (2017) stated that good communication is crucial to teachers in that they must be proficient communicators to transmit knowledge, skills, and values and simultaneously communicate their care for the students.

Importance of Soft Skills

The result of the short-written commentary about teacher participants' experience with the importance of soft skills in teaching science led to the emergence of three unifying themes.

Theme 1: Soft skills are essential in developing the best outcomes.

The result shows that among the teacher-participants, ten out of thirty-four teacher-participants shared that soft skills are essential in developing the best outcomes of learners' participation in their science class. It turns out well and reaches the main goal of the lesson, and students perform better.

- *Soft skills help students develop their life-long learning skills. It also supports the learners in achieving good character, personality, and instructional awareness, which entails individual activities and holistic development. (P18, P30)*

- *Soft skills help to do things better and have productive, enjoyable classes for the learners. (P2, P3)*

- *Soft skills are the best application for best rapport to exhibit proper tasks, teach math-based science, and integrate values (P11, P29, P33, P34).*

- *Soft skills are essential for everyone; they are the heart of teaching. (P9, P21)*

Kenton (2023) expressed that soft skills can also be thought of as people skills. These can include effective interpersonal and communication skills, teamwork, leadership, problem-solving abilities, a strong work ethic, and time management. These are qualities that are transferable to any role. These are characteristics that can be carried over to any position. It implies that teachers employ soft skills, and essential skills can be transmitted to the outputs of their students. Barnard (2019) agreed that strong, soft skills ensure a productive, collaborative, and healthy work environment, all crucial for organizations in an increasingly competitive world.

Theme 2: **Soft skills enhance students' collaboration in the learning process.**

- *Soft skills increase the productivity of the students, and the lesson can be imparted easily with different learning capabilities. (P10, P15, P17)*

- *Soft skills improve the work of other students easily through collaboration to achieve their desired academic goals. (P19. P28)*

Kirondo (2014) investigated that teachers shape students so that they will gain interest in studies and will not be affected much negatively by the rapid growth of science, technology, and globalization. It implies that soft skills enhance camaraderie among the learners, a life-long skill that the students will use in the future. McGarry (2022) supported the idea that soft skills can empower students to collaborate and work together to collectively meet their goals and objectives. In turn, this leads to improved efficiency and heightened productivity.

Theme 3: **Soft skills connect teachers with learners**

- *Soft skills affect teachers' attitudes toward teaching. It maintains collaboration and healthy relationships with the students. It helps to develop their emotional, social, and adaptive skills so that the learners will not find it hard to study science. (P14, P16, P32)*

- *Soft skills are needed to connect with learners of different values, backgrounds, and mental capabilities. Teachers should also possess these soft skills to understand the learners and co-workers (P1, P4).*

- *Soft skills make the teaching and learning experience more fun and engaging. (P31)*

In a study by Kenton (2023), company leaders are often most effective when they have strong, soft skills. For example, leaders are expected to have good speaking abilities, but great leaders are also good at listening to workers and other leaders in their fields. It implies that teachers effectively build relationships with the students as they transfer life-long learning skills to them. MBO Partners (2022) describe soft skills, often called people skills or emotional intelligence, as the ability to interact amicably with others. Honing your abilities to resolve conflicts, solve problems, and provide excellent service can lead to stronger relationships with colleagues, clients, and other professional contacts. Hattie (2003) believes that professionally qualified teachers with the appropriate soft skills influence students' interest and commitment to achieve their educational success quickly.

Integration of Soft Skills

In this study, the teacher-participants assess how they integrate soft skills in their science class. The results show three emerging themes encountered by the teacher-participants using soft skills in teaching science.

Theme 1: Integration in the collaborative activities

The result shows that among the teacher-participants, nine teacher-participants shared that soft skills are integrated during the students' group activities. They observed that collaborative works are very helpful and could encourage learners to always observe and find something new based on their experiences in the differentiated learning activity to strengthen their skills and stimulate learners' development in the learning process.

- *Soft skills are integrated into the group activity in science laboratory experiments. Positive attitude and teamwork, leadership skills, social skills, learning to solve problems, having inquiry-based lessons and activities, and thinking analytically in experiments (P3, P10, P19, P30, P32)*

- *Soft skills are integrated into differentiated learning activities to strengthen their skills, which can stimulate learners' development in the learning process. Group activities in experiments, word problems, computation, and evident ways to develop their skills and encourage learners to always observe and find something new based on their experiences. It helps them to interact with others easily, which will build their confidence and add learning to their studies (P15, P16, P17, P28).*

Skills such as active listening, collaboration, presenting ideas, and communicating with colleagues are highly valued in the modern workplace (Barnard, 2019). MBO partners (2022) posited that soft skills are essential to improving one's ability to work with others and can positively influence furthering your career.

Theme 2: **Integration in planning the lesson.**

- *Soft skills increase the productivity of the students, and the lesson can be imparted easily with different learning capabilities. (P10, P15, P17)*

- *Soft skills improve the work of other students easily through collaboration to achieve their desired academic goals. (P19. P28)*

Teachers plan their lesson plans well. This sets the flow of their lessons and outlines the target competencies and values the students need to meet. According to Allison Academy (2022), the importance of soft skills for students is enormous, both with regard to their studies and with regard to their future careers. Early recognition of the value of soft skills helps students succeed academically, fulfill their obligations as students, network with potential future employers, and enhance their presentation skills to instructors, who may also have a significant influence in their professional lives.

It implies that soft skills are directly correlated with improved academic achievement, so students should develop them both for their education and for teachers' professional careers.

Theme 3: **Integration in the lesson proper**

- *Soft skills motivate students to participate better and be productive during the lesson's discussion. It improves the work of the students and helps them cope with the lesson (P2, P18).*

- *Soft skulls are employed during the integration of the values, providing generalization and application. (P4, P33)*

- *Soft skills integrated during the lesson proper make the students feel loved and important (P12).*

In the study of Jazeel and Saravanakumar (2015), a class observed by a teacher shows the impacts on the part of students. The analysis of students' feedback with regard to the effect of the communication skills of teachers among students shows that the soft skill of various communication skills of students has a lingering impact on students. In the report by MBO Partners (2022), soft skills are essential to improving one's ability to work with others and can positively influence furthering your career. It implies that soft skills can influence your ability to give a great presentation and communicate your points effectively.

Conclusions

Based on the findings of the study, the teachers' established soft skills proficiency level meant that they efficiently performed their roles and functions to enhance the students' performance in their science classes. The soft skills of science teachers are currently practiced and considered one of the qualities a teacher should have. These skills are personal transferrable competencies useful in teaching and necessary to interpret and understand complex situations. Moreover, soft skills are highly preferred in teaching science and help teachers create a healthy working environment and efficient classroom instruction. Teachers, as strong determinants of performance, develop and implement lessons for the welfare of the learners and to achieve lifelong learning skills. They will be more effective in improving the student's academic achievement and intervening in behavioral problems that prevent learners from completing all needed competencies. Soft skills in science teaching are essential in developing the best outcomes, enhancing students' collaboration in the learning process, and connecting teachers with learners. This helps teachers prepare for and understand the objectives of their lessons. This finding implies that teachers gather data-driven evidence to inform decisions about developing lessons to improve the teaching-learning process.

Furthermore, teachers integrated soft skills into their science teaching during the collaborative activities, planning the lesson, and in the lesson proper. Being the master facilitator of learning for the students, teachers set the flow of their lessons and define the target competencies and values the students need to meet. They observed that soft skills are more helpful and effective during the planning and practical performance of the lesson based on their experiences in the differentiated learning activity to strengthen the skills and stimulate learners' development in the science learning process.

References

10 Keys to Happier Living. (n.d.). Action for Happiness. https://actionforhappiness.org/10-keys

A Tool to Measure Teachers' Soft Skills: Results of a Pilot Study - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Items-of-the-Questionnaire-on-Teachers-Soft-Skills-Direct-and-Indirect-Questions_tbl1_338048900 [accessed 1 Apr, 2023]

A. T. Onabamiro, A. O. U. Onuka, S. A. Oyekanmi, Teachers' Perception of Teaching and Assessing Soft Skills in Secondary Schools, *Education*, Vol. 4 No. 5, 2014, pp. 109-115. doi: 10.5923/j.edu.20140405.01.

Ackerman, C. (2018, July 5). *Positive Mindset: How to Develop a Positive Mental Attitude*. positivepsychology.com. Retrieved April 12, 2023, from https://positivepsychology.com/positive-mindset/#what-positive-mindset

Adaptability skills | Robert Half. (2019b, December 15). https://www.roberthalf.com.au/career-advice/career-development/adaptability-skills

Agrawal, B. B. W. a. S. (2018, July 12). Employee Burnout, Part 1: The 5 Main Causes. *Gallup.com*. https://www.gallup.com/workplace/237059/employee-burnout-part-main-causes.aspx

Alhouli, Ali & Al-Khayatt, Abdul. (2020). Assessing the Soft Skills Needs of Teacher Education Students. International Journal of Education and Practice. 8. 416-431. 10.18488/journal.61.2020.83.416.431.

Allison Academy. (2022). The importance of soft skills for students. https://www.allisonacademy.com/students/self-improvement/importance-of-soft-skills-for-students/

Antón-Sancho, Á.; Vergara, D.; Fernández-Arias, P. Self-Assessment of Soft Skills of University Teachers from Countries with a Low Level of Digital Competence. Electronics 2021, 10, 2532. https://doi.org/10.3390/ electronics10202532

Applied Educational System (2016) Importance of Soft Skills accessed at http://blog.aeseducation.com/2015/06/importance-of-soft-skills/

Astriyani, D., Susilo, H., Suwono, H., & Lukiati, B. (2017). Profil keterampilan berpikir analitis mahasiswa calon guru ipa dalam perkuliahan biologi umum. Jurnal Penelitian Pendidikan IPA, 2(1), 66–70. https://doi.org/10.26740/jppipa.v2n2.p66-7

Bauman, Z. (2011). Modernità liquida. Bari: Laterza

Barnard, D. (2019). The Importance of Soft Skills. virtualspeech.com. https://virtualspeech.com/blog/importance-soft-skills

Bhatnagar, Nitin. 2011. *Effective communication and soft skills.* New Delhi, IN: Pearson Education India.

Birjandi, Parviz, and Marzieh Bagherkazemi. 2010. The relationship between Iranian EFL teachers' critical thinking ability and their professional success. *English Language Teaching* 3, no. 2: 135-145. **DOI:** 10.5539/elt.v3n2p135

Boon, Helen. 2011. Raising the bar: Ethics education for quality teachers. *Australian Journal of Teacher Education* 36, no. 7: 76-93.

Brewster, C., & Railsback, J. (2001). Supporting beginning teachers: How administrators, teachers, and policymakers can help new teachers succeed. Portland, OR: Northwest Regional Educational Laboratory

Brolin, D. E., & Loyd, R. J. (2004). *Career development and transition services: A functional life skills approach* (4th ed.). Upper Saddle River, NJ: Pearson Merrill Prentice-Hall.

Bybee R W & Trowbridge L W 1996 Teaching Secondary School Science Strategies For Developing Scientific literacy Englewood (New Jersey: Merrill an Imprint of Prentice Hall)

Capulong, J. I. (2017). Importance of good communication skills for teachers. *SDO Balanga City.*

Carolan, C. M., Forbat, L., and Smith, A. (2016). Developing the DESCARTE Model: The Design of Case Study Research in Health Care. Qualitative Health Research, 26(5) 626– 639

CEDEFOP. Typology of Knowledge, Skills, and Competences: Clarification of the Concept and Prototype. CEDEFOP. 2006; Accessed 12 May, 2012. Available: http://www.cedefop.europa.eu/EN/Files/3048_en.pdf.

Cherry, K. (2017A). The benefits of positive thinking for body and mind. *Very Well Mind.* Retrieved from https://www.verywellmind.com/benefits-of-positive-thinking-2794767

Cherry, K. (2017B). Understanding the psychology of positive thinking. *Very Well Mind*. Retrieved from https://www.verywellmind.com/what-is-positive-thinking-2794772

Cinque, M. (2017). MOOCs and Soft Skills: a comparison of different courses on Creativity. *Journal of E-Learning and Knowledge Society*, *13*(3). https://doi.org/10.20368/1971-8829/1386

Claxton, G., Costa, A., & Kallick, B. (2016). Hard thinking about soft skills. *Educational Leadership, 37*(6), 60-64.

Coelho, M. J., & Martins, H. (2022). The future of soft skills development: a systematic review of the literature of the digital training practices for soft skills. *Journal of E-Learning & Knowledge Society*, *18*(2), 78–85. https://doi.org/10.20368/1971-8829/1135576

Collie, R., Martin, A., & Granziera, H. (2018). Being able to adapt in the classroom improves teachers' well-being. *The Conversation.*

Conrad CA, Leigh WA. Soft Skills: Bridge or Barrier to Employment? The monthly magazine of the Joint Center for Political and Economic Studies. 1999;27(1): Accessed 14 April, 2012. Available: http://www.stanford.edu/group/scspi/_media/pdf/softskilltrainingfocusarticle.pdf.

Conrad, David, and Robert Newberry. 2011. 24 Business communication skills: Attitudes of human resource managers ver- sus business educators. *American Communication Journal* 13, no. 1: 4-23.

Corporate Finance Institute. (2023). Communication Skills. *Corporate Finance Institute*. https://corporatefinanceinstitute.com/resources/management/communication/

Crutchfield, Tammy N., and Kimberly Klamon. 2014. Assessing the dimensions and outcomes of an effective teammate. *Journal of Education for Business* 89, no. 6: 285-291.

Dall'Amico E. (2016). Quali sono le Soft Skill più richieste dalle imprese? (Project2014-1-IT02-KA204-003515, Valorize High Skilled Migrants). Centro Estero perl'Internazionalizzazione Piemonte, Torino.

de Campos, D. B., de Resende, L. M. M., & Fagundes, A. B. (2020). The Importance of Soft Skills for the Engineering. Creative Education, 11, 1504-1520. https://doi.org/10.4236/ce.2020.118109

Deepa, Seth, and Manisha Seth. 2013. Do soft skills matter? Implications for educators based on recruiters' perspective. *IUP Journal of Soft Skills* 7, no. 1: 7-20.

Dixon, F., Cassady, J., Cross, T., & Williams, D. (2005). Effects of technology on critical thinking and essay writing among gifted adolescents. *Journal of Secondary Gifted Education, 16*(4), 180-189.Available at: https://doi.org/10.4219/jsge-2005-482.

Doyle, A. (2021, March 13). Communication Skills for Workplace Success. *The Balance*. https://www.thebalancemoney.com/communication-skills-list-2063779

Doyle, A. (2021b). Important Adaptability Skills for Workplace Success. *The Balance*. https://www.thebalancemoney.com/important-adaptability-skills-4768260#citation-7

Elo S, Kaarianinen M, Kanste O, Polkki R, Utriainen K, & Kyngas H. (2014). *Qualitative Content Analysis: A focus on trustworthiness*. Sage Open. 4:1-10.

Fredrickson, B. (2004). The broaden-and-build theory of positive emotions. Philosophical Transactions of the Royal Society B: Biological Sciences, 359, 1367-1378.

Gaines, R., Mohammed, M. "Soft Skills Development in K-12 Education: Research Brief." Georgia Leadership Institute for School Improvement, 2013, p 1. http://www.glisi.org/sites/default/files/GLISI_SSResearchBrief_E1.pdf 2 "Cooperative Learning." Johns Hopkins University, 2012. http://education.jhu.edu/PD/newhorizons/strategies/topics/Cooperative%20Learning/

Galloway, T, Lippman, L., Burke, H., Diener, O., and Gates, S. (2017). Measuring Soft Skills & Life Skills in International Youth Development Programs: A Review and Inventory of Tools. Washington, DC: USAID's YouthPower Implementation IDIQ- Task Order 1, YouthPower Action.

Greenhill, V. (2010d). 21st Century Knowledge and Skills in Educator Preparation. *Partnership for 21st Century Skills*.

Helterbran, Valeri R. 2010. Teacher leadership: Overcoming'I am just a teachers' syndrome. *Education* 131, no. 2: 363-371.

Hurrell, S. A. (2009). *Soft skills deficits in Scotland : their patterns, determinants and employer responses*. STAX. https://stax.strath.ac.uk/concern/theses/np193970f?locale=es

Indeed Editorial Team. (2023). Communication Skills: Definitions and Examples. *Indeed Career Guide*. https://in.indeed.com/career-advice/resumes-cover-letters/communication-skills

India, T. (2022, February 4). Energy management can give a boost to your time management skills. *Tribuneindia News Service*. https://www.tribuneindia.com/news/schools/energy-management-can-give-a-boost-to-your-time-management-skills-367001

Itani, M., & Srour, I. (2015). Engineering Students' Perceptions of Soft Skills, Industry Expectations, and Career Aspirations. Journal of Professional Issues in Engineering Education and Practice, 142, Article ID: 04015005. https://doi.org/10.1061/(ASCE)EI.1943-5541.0000247

Jaafar, Syaiful & Fathil, Nor Fathimah & Zambi, Mamat. (2021). Classroom activities improve soft skills. SSRN Electronic Journal. 10.2139/ssrn.3803707.

Jazeel, A.M. and Saravanakumar (2015). Improving Writing Skills of PGDE Students in English through ICT-Enriched Instructional Approaches, Proceedings of International Research Conference on Humanities and Social Sciences, Faculty of Humanities and Social Sciences, University of Sri Jayawardanapura, 3rd December, 2015. P.123 ISSN 2279 - 2309

Jazeel, A.M.. (2016). SOFT SKILLS FOR PROFESSIONAL TEACHERS: A NEW PERSPECTIVE IN TEACHER EDUCATION.

Kamenetz, A. (2015). Nonacademic skills are key to success. But what should we call them? Retrieved from National Public Radio Education Website: www.npr.org/sections/ed/2015/05/28/404684712/non-academic-skills-are-key-tosuccess-but-what-should-we-call-them.

Kaplan, Z. (2023). What Are Adaptability Skills? Definition and Examples. *Forage*. https://www.theforage.com/blog/skills/adaptability

Karras, K. (2022). *The Importance of Acquiring Soft Skills by Future Primary Teachers: A Comparative Study*. ERIC. https://eric.ed.gov/?id=ED622699

Keller, Melanie M., Thomas Goetza, Eva S. Beckera, Vinzenz Morgerb and Lauren Hensley. 2014. Feeling and showing: A new conceptualization of dispositional teacher enthusiasm and its relation to students' interest. *Learning and Instruction* 33: 29-38. **DOI:** 10.1016/j.learninstruc.2014.03.001

Kenton, W. (2023). What Are Soft Skills? Definition, Importance, and Examples. Investopedia. https://www.investopedia.com/terms/s/soft-skills.asp

Kirondo, Y.A. (2014). Strategies Employed by Teachers to Motivate Students in Kinondoni Municipality.

Koonmee, Koonmeea, Anusorn Singhapakdib, Busaya Virakula, and Dong-Jin Lee .2010. Ethics institutionalization, quality of work life, and employee job-related outcomes: A survey of human resource managers in Thailand. *Journal of Business Research* 63, no. 1: 20-26.

Kuusisto, Elina, Kirsi Tirri, and Inkeri Rissanen. 2012. Finnish teachers' ethical sensitivity. *Education Research International.* **DOI:** 10.1155/2012/351879

Learn and Grow: What is adaptability in the workplace? | It's Your Yale. (n.d.). https://your.yale.edu/learn-and-grow-what-adaptability-workplace

Lee, Li-Tze, and Tien-Tse Lee. 2011. Investigating soft skills for success in the workforce: Perceptions of elementary school teachers. International Review of Social Sciences and Humanities 1, no. 2: 140-149.

Linda Darling-Hammond, Lisa Flook, Channa Cook-Harvey, Brigid Barron & David Osher (2020) Implications for educational practice of the science of learning and development, Applied Developmental Science, 24:2, 97-140, DOI: 10.1080/10888691.2018.1537791

Lingard, Robert W. 2010. Improving the teaching of teamwork skills in engineering and computer science. *Journal of Sys- temics, Cybernetics, and Informatics* 8, no. 6: 20-23.

Lmd. (n.d.). Energy Management is the New Time Management. *www.linkedin.com*. https://www.linkedin.com/pulse/energy-management-new-time-lmdagency?trk=pulse-article

Lotzar, Eliyahu, "Employee Soft Skills and Organizational Culture: An Exploratory Case Study" (2018). Education Doctoral. Paper 383.

Loyd, Robert. (2004). Career Development & Transition Services: A Functional Life Skills Approach (4th ed.)..

Ludlow, Barbara. 2011. Teacher leadership: Why teachers must be leaders. *Teaching Exceptional Children* 43, no. 5: 6.

Macqual, S.M., Salleh, U.K.M., & Zulnaidi, H. (2021). Assessing prospective teachers' soft skills curriculum implementation: Effects on teaching practicum success. *South African Journal of Education, 41(3)*

Main, Katherine. 2010. Teamwork-Teach me, teach me not: A case study of three Australian preservice teachers. *The Aus- tralian Educational Researcher* 37, no. 3: 77-93. **DOI:** 10.1007/BF03216931

Majid, Shaheen, Zhang Liming, Shen Tong, and Siti Raihana. 2012. Importance of soft skills for education and career success. *International Journal for Cross-Disciplinary Subjects in Education* 2, no. 2: 1037-1042. **DOI:** 10.20533/ijcdse.2042.6364.2012.0147

Maldonado-Carreñ o, Carolina, and Elizabeth Votruba-Drzal. 2011. Teacher–child relationships and the development of aca- demic and behavioral skills during elementary school: A within-and between-child analysis. *Child Development* 82, no. 2: 601-616.

Malinin, Laura. (2017). Soft Skill Development in Service-learning: Towards Creative Resilience in Design Practice. Proceedings of the Institution of Civil Engineers - Urban Design and Planning. 171. 1-18. 10.1680/jurdp.17.00012.

Mamun, Md Abdullah Al. (2012). The Soft Skills Education for the Vocational Graduate: Value as Work Readiness Skills. British Journal of Education, Society & Behavioural Science. 2. 326-338. 10.9734/BJESBS/2012/1858.

Marques, Joan. 2013. Understanding the strength of gentleness: soft-skilled leadership on the rise. *Journal of Business Ethics* 116, no. 1: 163-171. **DOI:** 10.1007/s10551-012-1471-7

McGarry, O. (2022). The Benefits of Soft Skills Training for your Workforce. LearnUpon. https://www.learnupon.com/blog/soft-skills-training/

Mellano, J. P. (2022). *TEACHERS' SOFT SKILLS ON STUDENTS' SCIENCE PROCESS CAPABILITIES AND ACADEMIC PERFORMANCE.* [Unpublished Master Thesis].

Memerson. (2022b, August 9). *Eight Things You Can Do To Improve Your Communication Skills - Professional Development | Harvard DCE.* Professional Development | Harvard DCE. https://professional.dce.harvard.edu/blog/eight-things-you-can-do-to-improve-your-communication-skills/

Michael Sony & Nandakumar Mekoth (2022) Employee adaptability skills for Industry 4.0 success: a road map, Production & Manufacturing Research, 10:1, 24-41, DOI: 10.1080/21693277.2022.2035281

Monteiro, Angélica & Leite, Carlinda. (2020). Digital literacies in higher education: Skills, uses, opportunities and obstacles to digital transformation. Revista de Educación a Distancia (RED). 21. 10.6018/red.438721.

Moore, T. (2004). The critical thinking debate: How general are general thinking skills? *Higher Education Research & Development, 23*(1), 3-18.Available at: https://doi.org/10.1080/0729436032000168469.

Moss P, Tilly C. Soft' skills and race: An investigation of black men's employment problems. Work and Occupations. 1996;23(3):252–276.

Munda, N. P. (2021). The Adaptability of public school teachers amidst the pandemic. *Central Mindanao University Journal of Science*. DOI: 10.52751/PEMW2173.

Murphy, S. E., Putter, S., & Johnson, S. K. (2014). Soft skills training: Best practices in industry and higher education. In R. E. Riggio & S. J. Tan (Eds.), *Leader interpersonal and influence skills: The soft skills of leadership* (pp. 5844–6499). New York, NY: Routledge.

Noddings, Nel. 2012. The caring relation in teaching. *Oxford Review of Education* 38, no. 6: 771-781. **DOI:** 10.1080/03054985.2012.745047

Otacioglu, S. (2008). Prospective teachers' problem-solving skills and self-confident levels. *Educational Sciences: Theory and Practice. 915-923*

Padhi, Prasanta. (2014). Soft Skills: Education beyond Academics. IOSR Journal of Humanities and Social Science. 19. 01-03. 10.9790/0837-19560103.

Panfilova, Alvina & Larchenko, Lyubov. (2021). Innovative tools for developing soft skills in the context of education transformation. SHS Web of Conferences. 97. 01024. 10.1051/shsconf/20219701024.

Partners, M. (2023, August 2). What are Soft Skills and Why are they Important in the Workplace? MBO Partners. https://www.mbopartners.com/blog/how-manage-small-business/why-are-soft-skills-important/#

Patacsil, F. F., & Tablatin, C. L. S. (2017). Exploring the importance of soft and hard skills as perceived by IT internship students and industry: A gap analysis. *Journal of Technology and Science Education, 7*(3), 347-368.Available at: https://doi.org/10.3926/jotse.271.

Peace and Happiness Foundation. (n.d.). Peace and Happiness Foundation. https://peaceandhappiness.org/tag/analytical-thinking-skill/#:~:text=Analytical%20thinking%20means%20examining%20the,to%20evaluate%20their%20analytical%20abilities.

Pietro, Orlando & Altomari, Natalia. (2019). A Tool to Measure Teachers' Soft Skills: Results of a Pilot Study. Advances in Social Science and Culture. 1. p245. 10.22158/assc.v1n2p245.

Problem Solving, Critical Thinking, and Analytical Reasoning Skills Sought by Employers - Radford University. (n.d.). https://www.radford.edu/content/cobe/innovation-analytics/analytics/career-prep/report-e.html

Puccio, Gerard J., Marie Mance, and Mary C. Murdock. 2010. ***Creative leadership: Skills that drive change.*** Buffalo, NY: Sage Publications.

Rahmanpour, M., Teimori, S., & Momeni Mehmooee, H. (2011). Examining the effects of life skills training on mental health and self-esteem of fifth-grade female elementary students. *Journal of New Thoughts on Education, 6*, 102-112.

Rajan, K. (2018, September 4). *Inspiring quotes of teachers by Dr. APJ Abdul Kalam.* Speakingtree. Retrieved April 8, 2023, from https://www.speakingtree.in/allslides/inspiring-quotes-of-teachers-by-dr-apj-abdul-kalam

Ramadani, A. S., Supardi, Z. A. I., Tukiran, & Hariyono, E. (2021). Profile of Analytical Thinking Skills Through Inquiry-Based Learning in Science Subjects. Studies in Learning and Teaching, 2(3), 45-60. https://doi.org/10.46627/silet.v2i3.83

Rao, M. S. 2010. ***Soft skills: Enhancing employability: Connecting campus with corporate.*** New Delhi, IN: IK International Pvt Ltd.

RiseSiteBuild. (2020, April 3). *Understanding My Journey - RiSE International.* RiSE International. https://riseinternational.org.uk/project-posts/understanding-my-journey/

Robinson, R.S. (2014). Purposive Sampling. In: Michalos, A.C. (eds) Encyclopedia of Quality of Life and Well-Being Research. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-0753-5_2337

Robles, Ava Clare Marie & Lavilles, Hector. (2017). Teachers' Soft Skill Proficiency Level and School Performance of Selected Schools in Sultan Kudarat Division.

Sajedi, S., Attashpour, H., Kamkar, M., & Samsam, S. M. R. (2009). The impact of life skills training on interpersonal relations and self-esteem and self-expression of blind girls. *Knowledge and Research in Applied Psychology, 11*, 96-102.

Sandhu, R. (2014). A study of life skills of pupil teachers. *Indian Journal of Fundamental and Applied Life Sciences, 4*(3), 389-395.

Sasson, R. (n.d.). The power of positive thinking. *Success Consciousness.* Retrieved from https://www.successconsciousness.com/index_000009.htm

Schulz, B. (2008). The importance of soft skills: Education beyond academic knowledge. Nawa Journal of Communication, 2(1), 146-154.

Schwartz, T. (2023, February 8). *Manage Your Energy, Not Your Time.* Harvard Business Review. https://hbr.org/2007/10/manage-your-energy-not-your-time

SEI-DOST & UP NISMED, (2011). Framework for philippine science teacher education. Manila: SEI-DOST & UP NISMED.

Setiawaty, B. T., Sunarno, W., & Sugiyarto, S. (2019). Profil kemampuan berpikir analisis siswa sekolah menengah pertamadi Surakarta. Prosiding Seminar Nasional Pendidikan Sains, 234–238.

Shakir, R. Soft skills at the Malaysian institutes of higher learning. *Asia Pacific Educ. Rev.* **10**, 309–315 (2009). https://doi.org/10.1007/s12564-009-9038-8

Shakir, Roselina. (2009). Soft skills at the Malaysian institutes of higher learning. Asia Pacific Education Review. 10. 309-315. 10.1007/s12564-009-9038-8.

Sharma, M. (2021). 5 characteristics of an effective science teacher – from a researcher who trains them. *The Conversation*

Shorten A, Smith J. (2017). Mixed methods research: expanding the evidence base. *Evidence-Based Nursing* 2017;**20:**74-75.

Snape, P. (2017). Enduring Learning: Integrating C21st Soft Skills through Technology Education. *Design and technology education : an international journal, 22*, 48-59.

Susilawati et al 2020 J. Phys.: Conf. Ser. 1460 012111

Susilawati, Susilawati & Aznam, Nurfina & Hw, Paidi & Ngadimin,. (2020). Teachers' perspectives toward soft skills in science learning. Journal of Physics: Conference Series. 1460. 012111. 10.1088/1742-6596/1460/1/012111.

Tang, Keow Ngang. (2018). The importance of soft skills acquisition by teachers in higher education institutions. Kasetsart Journal of Social Sciences. 10.1016/j.kjss.2018.01.002.

Taygerly, T. (2023, February 14). *How to Develop a Strong Work Ethic*. Harvard Business Review. https://hbr.org/2022/09/how-to-develop-a-strong-work-ethic

Telesca, M. (2021, July 27). The value of developing soft skills in students' education. ETN Magazine. https://www.etnmagazine.eu/european-projects-dissemination/the-value-of-developing-soft-skills-in-students-education/

Time management and Energy management in testing. (n.d.-b). Today Software Magazine. https://todaysoftmag.com/article/1952/time-management-and-energy-management-in-testing

Toyama, Narumi. 2014. ***Japanese senior high school teachers' perceptions of the role of teachers in promoting the emo- tional well-being of their students.*** Master's thesis, University of Wollongong, New South Wales, AU.

Tran, T. T. (2013). Limitation on the development of skills in higher education in Vietnam. *Higher Education, 65*(5), 631-644.Available at: https://doi.org/10.1007/s10734-012-9567-7.

Udompong L, Traiwichitkhun D & Wongwanich S 2014 Causal model of research competency via scientific literacy of teacher and student Procedia Social and Behavioral Sciences 116 1581

United Nations Children's Fund. (2012). *Global evaluation of life skills education programmes: Final report*. New York: Author.

Utopia (2016) Introduction: Teaching Soft Skills to Our Students, accessed at http://www.edutopia.org/discussion/special-introductions-teaching-soft-skills-our-students

Vasconcelos, J. A. (2018). Reflections. Philosophy and Daily Life . Sao Paulo: Publisher SM.

Wahl, H., Kaufmann, C., Eckkrammer, F., Mense, A., Gollner, H., Himmler, C., Rogner, W., Baierl, T., & Slobodian, R. (2012). Soft Skills In Practice And In Education: An Evaluation. *American Journal of Business Education (AJBE)*, *5*(2), 225–232. https://doi.org/10.19030/ajbe.v5i2.6826

Washor, Kim Stack, "BRIDGING THE SOFT-SKILL GAP FROM EDUCATION TO EMPLOYMENT THROUGH INTERNSHIPS" (2015). Open Access Dissertations. Paper 318. https://digitalcommons.uri.edu/oa_diss/318

What is Work Ethics? | peopleHum. (n.d.). Peoplehum. https://www.peoplehum.com/glossary/what-is-work-ethics

Work Ethic: Developing a Stronger Ethic at Work. (2022, October 4). Personio. https://www.personio.com/hr-lexicon/work-ethic/

Work Ethics – Georgia Piedmont Technical College. (n.d.). https://www.gptc.edu/compliance-notices/work-ethics/

Work Styles — Adaptability/Flexibility. (n.d.). https://www.onetonline.org/find/descriptor/result/1.C.4.c

Writer, S. (2020) What Is a Descriptive-Normative Survey? Retrieved from: ://www.reference.com/world-view/descriptive-normative-survey-c0cf2e08d1205d41

Yigiter, K. (2013). Investigation of the problem solving-skill, self-esteem and preferences of the university students regarding sport and social activity in Turkey. *International Journal of Academic Research Part B, 5*(4), 220-226.

Yin, R. K. (2014). Case study research: Design and method, (5th ed.,). Thousand Oaks: Sage.