Establishing a Special Science Elementary School (SSES) Program at Tacurong Pilot Elementary School: A Feasibility Study

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.906000141

Received: 02 June 2025; Accepted: 04 June 2025; Published: 03 July 2025

ABSTRACT

This study assessed the feasibility of establishing a Special Science Elementary School (SSES) Program at Tacurong Pilot Elementary School (TPES) in response to the growing need for enhanced Science education at the elementary level. Using a mixed-methods approach involving surveys and semi-structured interviews, the study assessed the market, technical, management, financial, and socio-economic aspects of the study. Findings reveal strong support from students, parents, teachers, and school administrators for the integration of a hands-on, inquiry-based Science curriculum. However, challenges such as limited laboratory facilities, insufficient teacher training, and financial constraints were identified. Strategic solutions, including phased implementation, capacity building, and strong community partnerships, were proposed to address these concerns. The cost-benefit analysis demonstrated that the program is financially sustainable and socio-culturally viable. Overall, the study concludes that establishing the SSES Program at TPES is feasible and has the potential to enhance STEM education outcomes in the region significantly.

Keywords: Special Science Elementary School, Tacurong Pilot Elementary School, STEM education, inquiry-based learning, teacher training, financial sustainability, community engagement

INTRODUCTION/RATIONALE

Science education is vital for developing critical thinking, problem-solving skills, and scientific literacy in early learners. However, recent international assessments show that the Philippines continues to face considerable issues in this area. According to the 2022 Programme for International Student Assessment (PISA), and the 2019 Trends in International Mathematics and Science Study (TIMSS), Filipino students rated among the lowest in terms of Science proficiency, demonstrating challenges in applying scientific knowledge to real-world scenarios.

These findings emphasize the urgent need for educational reforms that promote inquiry-based learning, hands-on experimentation, and deeper student engagement in scientific processes. Both the National Research Council of the Philippines (NRCP, 2020) and the U.S. National Research Council (NRC, 2020) advocate for strengthening STEM education through student-centered, inquiry-driven approaches that emphasize modern teaching strategies, environmental integration, and technology-enhanced instruction to improve scientific reasoning and classroom engagement. Research further supports that students exposed to inquiry-based science instruction consistently demonstrate higher academic performance compared to those in traditional, lecture-dominated classrooms.

Recognizing these challenges, the Department of Education (DepEd) has issued several policy directives aimed at improving Science curriculum nationwide. Prominent among these is DepEd Order No. 21, s. 2019, otherwise known as Policy Guidelines on the K to 12 Basic Education Program, which enshrines the Spiral Progression Approach—a pedagogy that espouses the gradual yet logical progression of scientific ideas across grade levels. To complement this, Republic Act No. 10533, also referred to as the Enhanced Basic Education Act of 2013, enhances curriculum reforms that focus on critical thinking, creativity, and lifelong learning. Additionally, the Philippine Development Plan 2023–2028 highlights the crucial role of STEM education in advancing national development.

Locally, Tacurong Pilot Elementary School (TPES), a key public institution in the City of Tacurong, faces similar challenges in delivering quality Science education. Teachers have observed that traditional lecture-based instruction often fails to capture students' interest and stimulate deeper understanding. The limited availability of laboratory equipment, digital tools, and structured inquiry-based activities further constrains students' learning experiences. There are no other schools in the city that offer the SSES Program, and many of the children attend underprivileged schools where there are few possibilities for extracurricular Science enrichment.

To address these gaps, this feasibility study explores the potential of establishing a Special Science Elementary School (SSES) Program at TPES. The proposed program will focus on enhanced curriculum design, teacher training, availability of instructional resources, and support from key stakeholders. It aims to integrate hands-on scientific inquiry, local environmental issues, and technology-driven learning to develop students' scientific thinking and problem-solving capabilities. Ultimately, this initiative seeks to transform TPES into a model for dynamic, engaging, and research-based science instruction—better preparing its students for academic success and future opportunities in STEM-related fields.

Legal Bases

The proposed implementation of the SSES Program at TPES is anchored on a robust set of legislative and policy frameworks aimed at advancing Science, Technology, Engineering, and Mathematics (STEM) education in the Philippines. These legal foundations underscore the national commitment to fostering scientific literacy, innovation, and inclusive education.

One of the primary legal foundations is DepEd Memorandum No. 2023-014, which outlines new laws on Special Curricular Programs and strengthens fair access to high-quality education. In order to integrate educational possibilities with the larger objectives of national development, it specifically promotes the extension of STEM-oriented projects to underprivileged and marginalized areas. The implementation of modern, inquiry-based science curricula that address regional and international educational needs is made possible by this policy.

Moreover, DepEd Order No. 57, s. 2011 serves as the main directive for the SSES Program, which aims to improve elementary students' literacy in Science and Mathematics by providing them with excellent curricula, experience-based learning, and a better learning environment. Supplemented by the Governance of Basic Education Act of 2001, commonly known as Republic Act No. 9155, giving schools the latitude to carry out locally relevant educational activities to mandate school-based management. This legislation provides school administrators the power to push innovations, acquire resources, and change curricula—all of which are essential for the implementation of specialized programs like the SSES.

Further strengthening this basis is Republic Act No. 10533, known as the Enhanced Basic Education Act of 2013. This law mandates the enhancement of the basic education curriculum through research-based, learner-centered, and developmentally appropriate instructional strategies. It also explicitly supports the integration of specialized tracks and programs within the K–12 curriculum, thus enabling schools like TPES to adopt Science-focused curricular offerings that cultivate higher-order thinking and global competitiveness among learners.

In addition, Republic Act No. 11337, or the Innovative Startup Act, highlights the importance of developing innovation-driven mindsets among Filipino youth. This law encourages problem-solving through technological applications, fostering an environment where Science and innovation are essential tools for national progress. Similarly, the Philippine Development Plan (PDP) 2023–2028 positions research, technology, and innovation as central pillars of economic and educational advancement. It explicitly identifies STEM education at all levels as a strategic priority to address developmental challenges and enhance global competitiveness.

At the international level, the UNESCO Education 2030 Framework for Action calls for the integration of STEM education into national curricula to prepare learners for participation in a knowledge-based economy. It

advocates for inclusive, equitable, and quality education that equip students with the 21st-century skills necessary for sustainable development.

Together, these legal and policy foundations provide strong justification for the implementation of an innovative, inquiry-based Science curriculum at TPES. They ensure that the proposed SSES Program is aligned with national goals and global standards, eventually preparing learners for success in higher education and future careers in STEM-related fields.

Significance of the Study

The establishment of SSES Program at TPES is a crucial initiative that seeks to enhance the quality of STEM education and promote scientific literacy, critical thinking, and problem-solving skills among elementary students. This study holds significance for various stakeholders, as outlined below:

The Department of Education (DepEd). It sheds light on the effectiveness and effects of the SSES Program in developing scientific aptitude and critical thinking skills in elementary learners. The study's goal is to help DepEd achieve its purpose of providing excellent, inclusive, and relevant education by analyzing the program's implementation, resources, and outcomes.

The School. The establishment of a special Science program will allow TPES to improve its academic reputation and give students with more enriching educational experiences. The curriculum will serve as a model for incorporating hands-on, inquiry-based learning into elementary scientific instruction, ensuring that kids actively participate in their learning.

The School Leader. School leaders who drive the implementation of the SSES Program will demonstrate a dedication to academic excellence and forward-thinking leadership. The program provides an opportunity to form partnerships with educational institutions, government organizations, and community stakeholders, ensuring the program's long-term viability and success.

The Teachers. Educators will benefit from professional development programs that emphasize contemporary pedagogical approaches, such as experiential and project-based learning. These techniques will provide teachers with creative strategies for increasing student engagement and knowledge of scientific concepts, thus boosting instructional efficacy.

The Learners. Students will have access to an advanced science curriculum that focuses on critical thinking, problem solving, and creativity. The curriculum will develop scientific curiosity and inspire children to pursue STEM-related occupations, preparing them for the difficulties of secondary education and beyond.

The Parents. Families will have the assurance that their children are receiving a high-quality education that aligns with 21st-century learning demands. The program will encourage parents to take an active role in their children's education, resulting in stronger home-school connections that promote academic achievement.

The Community and Other Stakeholders**.** The establishment of the SSES Program will provide chances for collaboration among the school, local government agencies, and private organizations. The community's investment in STEM education helps to generate future scientists, engineers, and innovators capable of addressing local and global concerns.

The Neighboring High School and Science High Schools. The findings supports the goal of developing well-prepared elementary graduates who can easily move to STEM-focused high schools. By enhancing students' core knowledge, high schools will profit from academically prepared students who can flourish in difficult science and mathematics programs.

The Researchers. This study will contribute to the body of research on STEM education in elementary schools, providing insights into best practices for implementing specialized science curricula. Future researchers can build upon these findings to further enhance STEM education initiatives in the region.

Project Objectives

The following objectives guide the feasibility study of establishing an SSES Program at TPES:

Market Study: Educational Needs and Market Analysis

a. Determine the level of interest of Grades 3 to 5 students to enter into Special Science Program;
b. Determine the particular educational needs in respect of Science and Mathematics education; and
c. Serve students, parents, and teachers through surveys and interviews to gauge program need.

Technical Study: Strategic Planning and Sustainability

2.1 Assess the availability of trained instructors, classrooms, laboratory facilities, and supplementary teaching aids;

2.2 Explore the possibility of fitting the Special Science Program into the regular school calendar; and

2.3 Establish sustainable plan for long-term greenhouse, resource acquisition, and infrastructure development.

3. Management Study: Risk Assessment and Mitigation Strategies

3.1: Anticipate and plan how program implementation may be challenged by low enrollment and funding federal requirements, and develop strategies to address them; and

3.2 Establish strategies to minimize risk in collaboration, teacher training, and community involvement.

4. Financial Study: Financial Projections and Cost-Benefit Analysis

4.1 Formulate a line-item budget for the program, including overhead, teacher training, and learning materials;

4.2 Develop potential funding strategies such as soliciting government support and private sector collaboration; and

4.3 The program's cost effectiveness and long-term impact should be analyzed by a cost-benefit study.

5. Socio-Economic Study: Ethical and Socio-Cultural Considerations

5.1 Assess the ethical implications of program establishment, ensuring equitable access to all eligible students; and

5.2 Assess the effects of the SSES Program to the local community and its compa lity with socio-cultural values.

6. Decision on Implementation

6.1 Conclusion in the light of the findings, what would be the feasibility of the SSES Program at TPES; and

6.2 Recommendations for sustainability, scalability, and program effectiveness should be given.

METHODOLOGY

Data Gathering Procedure

To collect data, the researchers wrote communication letters to the Schools Division Superintendent and the school head, requesting permission to conduct surveys and interviews in accordance with the professor's advice. After gaining permission, they completed informed consent forms and conducted interviews and

surveys with each individual before entering the data into a database. The researchers acquired a variety of data, enabling them to gather a diverse combination of quantitative and qualitative information. In this study, they adopted a mixed-methods approach, as recommended by Creswell & Creswell (2014).

Surveys were distributed to students and parents to assess their interest in and support for the Special Science Program. The surveys were designed based on established principles in survey research to ensure clarity and validity (Dillman, Smyth, & Christian, 2014). In addition, semi-structured interviews with key stakeholders such as school administrators and teachers were conducted to gather insights on available resources and to explore their perspectives on the significance of enhancing science education. This interview format allowed for both structured questions and open-ended responses (Creswell, 2014).

All ethical considerations, including informed consent, voluntary participation, and confidentiality, were strictly observed in accordance with research ethics guidelines, as discussed by Creswell and Poth (2020).

Locale of the Study

The study was conducted at Tacurong Pilot Elementary School (TPES) located at Barangay Poblacion, Tacurong City. The school served a varied student group, with a total enrollment of 2,507 for the academic year 2024-2025. Of them, 105 were enrolled in the Fast Learner (FL) sections in Grades 3–5. The school had 81 classrooms and employed 103 teachers, six of whom were especially devoted to the Fast Learner sections. The availability of these sections, which were meant for academically talented students, made the school an attractive location for the feasibility study, particularly for testing an SSES program that aimed to expand STEM instruction through a specialized curriculum.

Respondents and Informants

The respondents of this study were administrators, teachers, parents, and learners from TPES. These respondents were strategically selected to represent key stakeholders in evaluating the feasibility of establishing an SSES Program. Their insights were crucial in determining their interest, awareness, and readiness to participate in the said program.

Sampling Technique

The study used purposive sampling to choose respondents from Grades 3 to 5, excluding Grade 6 students who were graduating. A total of 84 learners from the Fast Learner sections were selected using the Slovin formula with a 5% margin of error, ensuring a representative sample from a population of 105 learners. The table below presents the distribution of learner-respondents:

Table 1. Distribution of Learner-Respondents

Grade Level	Population (N)	Sample Size (n)
Grade 3	35	28
Grade 4	35	28
Grade 5	35	28
Total	**105**	**84**

In addition, 27 parents, representing 25% of the total parent population in the Fast Learner sections, participated in the survey to share their perceptions of the program, their children's academic needs, and their level of support for its establishment. The use of 10–25% of the accessible population is considered appropriate depending on the nature of the study, the desired level of precision, and the variability within the population (Singh, 2006). The table below summarizes the parent-respondents:

Table 2. Distribution of Parent-Respondents

Grade Level	Number of Parents
Grade 3	9
Grade 4	9
Grade 5	9
Total	**27**

The study also applied purposive sampling in selecting its core interviewees, particularly for the Key Informant Interviews (KIIs). This method is essential in qualitative research because it ensures that the selected participants possess specific, relevant knowledge and direct experience regarding the research topic. By intentionally choosing individuals who are informed and involved in the subject, researchers are able to gather deep, contextual insights aligned with the study's objectives (Calderon & Gonzales, 2018). In this regard, interviews were conducted with five teachers assigned to the FL sections to collect qualitative data on students' educational needs, available resources, and the feasibility of integrating the proposed program into the current curriculum. Additionally, the school head served as a key informant, providing perspectives on institutional readiness, resource availability, and anticipated challenges in implementation.

Instruments

The questionnaire used in this feasibility study was adapted and modified from Cantero and Cotoner's (2024) validated instrument, which was designed to gather critical insights from key stakeholders. The data gathered assisted in analyzing the demand for the special scientific program, assessing resource availability, identifying budgetary challenges, and forecasting potential problems with program implementation. The findings guided decision-making, ensuring that the curriculum met students' requirements while also fostering an inclusive learning environment.

Data Analysis

This study used a mixed-methods approach, including both quantitative and qualitative analysis, to provide a thorough knowledge of the study. Quantitative data were gathered via survey questionnaires distributed to the respondents. The survey results were encoded and examined with descriptive statistics including frequency, percentage, and mean. While for the qualitative data, the interviews were transcribed and analyzed using thematic analysis, allowing for the identification of recurring themes and insights relevant to the establishment of the SSES program.

RESULTS AND DISCUSSIONS

Market Study: Educational Needs and Market Analysis

The chart below visually illustrated the interest of students in participating in a program focused on learning more about Science and conducting experiments.

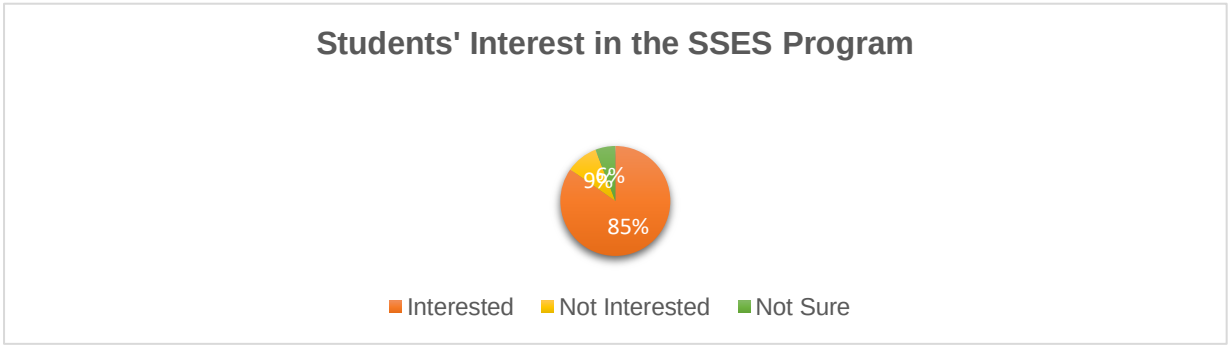

Figure 2 Percentage of Students Interested to join the SSES Program

The study indicated a very strong interest in students in Grades 3 through 5 for a SSES Program. 85% of the students (68 out of 80) had a strong desire to be in such a program, demonstrating strong enthusiasm for experimental, hands-on learning activities. Conversely, just 9% (7 students) stated that they would not be interested in being involved, and 6% (5 students) were not sure. These findings indicate a high level of potential interest in science learning opportunities expansion, but also identify a large percentage of students who might need further encouragement or more defined program information to be more secure about participating. Evidence is available that when students are presented with meaningful, active Science learning experiences like experiments, investigations, and application of Science to everyday problems, they demonstrate more motivation and accomplishment in the discipline (Freeman et al., 2014; National Research Council, 2012).

A systematic review of literature conducted by Tindan and Anaba (2024) identified that experiential science education strengthens students' conceptual knowledge, critical thinking, and problem-solving skills. Likewise, a study from Carnegie Mellon University (2021) emphasizes that active learning approaches, such as interactive tasks and experiments, yield improved academic results compared to the conventional lecture approach. In addition, inquiry-based learning (IBL) has been proven to effectively improve science interest and motivation among students. According to a 2023 systematic review conducted by Alarcon et al., IBL evokes research skill development and richer understanding of scientific principles. Another research conducted by Twizeyimana et al. (2024) proved that IBL promotes science subject enthusiasm and enables students to develop necessary science process skills through experiential activities.

The figure below shows the response of parents to the need for a Specialized Science Program.

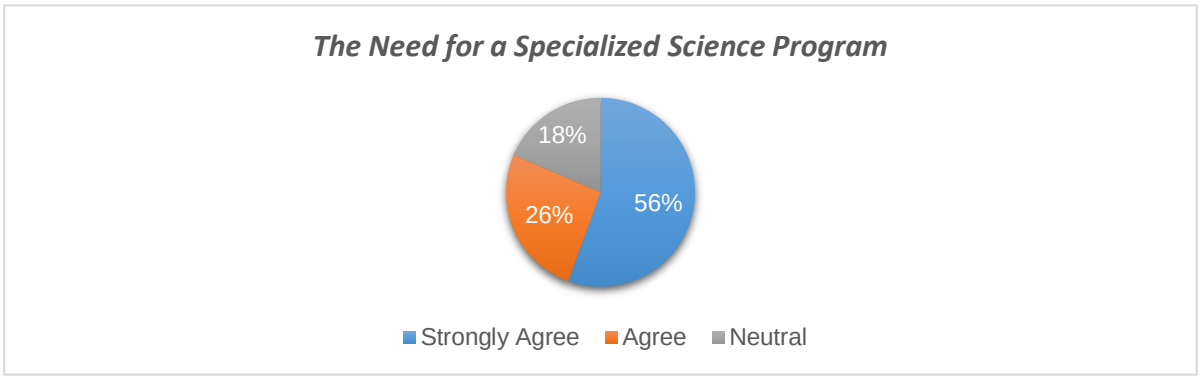

Figure 3. The Need for a Specialized Science Program

Additionally, the research revealed a clear consensus among the participants on the necessity of a special science program at Tacurong Pilot Elementary School. A large majority, 15 out of 27 parents or nearly 68%, strongly believe in the concept, pointing to concerted support for the implementation of the same. Another 7 participants (nearly 31%) agree, further substantiating the common perception that a special science program would be useful. No one disagreed or strong disagreement, and only 5 people (approximately 22%) were neutral, indicating that they neither support nor oppose the concept.

Supported by the studies of Smith & Lee (2020), and Wang et al., (2020), these findings show a decisive need for a Specialized Science Program, in line with more recent research that such programs enhance academic motivation and achievement through context-relevant learning strategies. The resounding endorsement indicates that the introduction of a specialized program would enhance the standard of science education in the school and possibly encourage higher interest and engagement in Science subjects.

Another crucial element of the research was identifying the particular educational requirements to make the program applicable and effective. Together, teachers always emphasized that limited resources are a major obstacle, as teachers themselves do not have the required tools and materials for practical activities. This is consistent with the results of a study conducted by Chinooneka (2015), which indicated that some teachers find it challenging to teach science because of limited resources, such as poor access to digital teaching tools like

laptops, tablets, and phones. Teachers, however, continue to find ways to acquire resources to support their teaching.

The table below summarizes the priorities as identified by teachers:

Table 3. Educational Needs Identified by Teachers and Learners

Priority Need	**Number of Teachers (out of 5)**
Adequate Resources	**5**
Extended Class Durations	**4**
Effective Classroom Management Strategies	**3**
Specialized Training in Science Education	**4**

"There are equipment that are not available, especially in our curriculum. Not all of them are available, especially for doing hands-on activities." (KII-T5-L31-33)

"Add more equipment and instructional materials so that, if it will be needed during hands-on activities it will be ready available." (KII-T1-L28-29)

Another challenge highlighted by the respondents is the issue of time constraints, which further impede effective teaching. The limited duration of class periods restricts the opportunity to deliver comprehensive lessons and engage students in hands-on activities, as observed by 4 out of 5 teachers. This concern is echoed in a study by Pasique and Maguate (2023), which found that educators face challenges in implementing Continuing Professional Development due to time constraints, among other factors.

"I hope there are changes with our class schedules. Because the time that we have now in our curriculum, 40 minutes is not enough for our Science." (KII-T5-L128-129)

"I believe I and my colleagues who are teaching Science have the same challenge— the time allotted for every topic. English, Math, Science and Filipino have 50 minutes only. For us, this is not enough to maximize learning during daily engagements." (KII-T3-L12-15)

Highlighted by 3 teachers, classroom management becomes particularly challenging during these hands-on activities, especially when resources and time are constrained, as. A study by Pan (2017) supports this observation, noting that teacher development faced obstacles due to insufficient access to teaching and learning resources, time limitations, and a lack of experience in science subjects.

"Teaching science is quite interesting yet it is also challenging. As a teacher, you must have to be more patient in dealing with the children during their hands-on activities because they become more loud and not easily managed." (KII-T1-L12-14)

"Finding enough time for SSES and other classes is tricky." (KII-T4-L69-70)

Additionally, the lack of specialized training in science education is a significant barrier, preventing teachers from effectively delivering lessons and implementing specialized programs like SSES, as stressed by 4 teachers. This is consistent with findings from a study by DeCoito and Estaiteyeh (2022), which highlighted that older teachers, in particular, often struggle to adapt to rapid technological advancements, underscoring the need for technical support and adequate funding.

"Need to have more trainings regarding SSES program, limited resources." (KII-T1-L40)

"With my background, I don't think I will be confident to handle SESS Program Science subjects unless I undergo special trainings or courses that will help me qualify for teaching the program." (KII-T3-L27-30)

The table below summarizes the priorities as identified by parents:

Table 4. Educational Needs Identified by Parents

Priority Need	**Number of Parents (out of 27)**
Science laboratories	**19**
Computer/technology labs	**17**
Update learning materials	**18**
Classroom spaces	**13**
Training for Teachers	**16**
Additional Funding	**14**

Conversely, parents identify a number of priority areas to be addressed in order to guarantee the effectiveness and relevance of the program. A large majority of the respondents, 70% (19 out of 27), cited science laboratories as the most important area, stressing the importance of properly equipped facilities for hands-on experimentation and learning. This concern is in alignment with the finding of a research in the Philippines' Davao del Sur Division, in which it was noted that a majority of public schools lack proper science laboratory equipment, facilities, and materials, thereby hindering the proper instruction of science (Diquito, 2023). Moreover, the National Science Teaching Association stresses the function of adequate lab facilities in the promotion of inquiry-based learning as well as increased critical thinking capability among students (NSTA, 2020).

New learning materials also came out as a significant factor, as 67% (18 respondents) concurred that existing resources need to be updated to capture the pace of science learning. The move toward electronic textbooks and Open Educational Resources (OER) has been cited as a way to offer updated content and boost accessibility, neutralizing the limitations of conventional print materials (Wired, 2019).

Also, 63% (17 respondents) emphasized the significance of computer and technology laboratories, citing the function of computer technologies in the augmentation of research and scientific discovery. According to Paje et al.'s (2021) study, the use of computer-based technology in science education significantly enhances the interests of students in learning and the understanding of concepts. Nonetheless, issues like low ICT literacy among teachers and unstable internet connectivity must be overcome to ensure the optimal utilization of technology integration in science education.

Teacher training, represented by 59% (16 respondents), is another important area, referring to the need for professional development to assure teachers have the most recent pedagogical strategies. Hussain et al.'s (2023) research underscores that well-integrated teacher training programs have a positive influence on instructional practices and outcomes for students in STEM education. It is recommended by the study that specialized training increases teachers' confidence and effectiveness in teaching science content.

Although classroom facilities and more funding were also suggested, they were not as immediate of a concern, with 48% (13 respondents) and 52% (14 respondents) suggesting these areas as in need of improvement. However, improvement in these areas continues to be vital to build an environment that fosters successful science learning and teaching.

Table 5. Parental Support for SSES Program

Parental Support Level	Number of Parents (out of 27)
Strongly Support	17
Moderately Support	8
Neutral	2

Furthermore, gaining the support of parents for the program was also a critical part of the research. Parents expressed their wishes for their children to become academically excellent, particularly in STEM-related disciplines, which they saw as important for becoming employable in the future. The results of the survey testifying to the great degree of support amongst respondents towards the implementation of an SSES program. Among 27 respondents, 17 (63%) demonstrated strong support and 8 (30%) showed moderately support, indicating a highly positive attitude toward the implementation of the program. Just 2 respondents (7%) were neutral, and remarkably, no respondent showed opposition to the concept. This massive support indicates a common strong belief that there is much value in increasing science education with a specialized program. Such supportive stakeholder engagement is significant since research such as that of Durlak and DuPre (2008) highlights that the success of education programs is highly dependent on the efforts and support of participants.

Overall, the results suggested strong stakeholder interest and support for the SSES Program. Students showed enthusiasm towards experiential and interactive learning experiences, as with Freeman et al. (2014), who asserted that active learning techniques dramatically raise the level of engagement and achievement by students in the STEM areas. Parents likewise provided considerable assistance, mirroring the significance of ensuring equal opportunities for all pupils, according to Reardon (2011), who emphasized the prime position of equal opportunities within education to the success of learners over the longer term. Teachers, nonetheless, pointed to fundamental needs according to resources and professional development, as per Darling-Hammond et al. (2017), who stressed that well-supported and frequently trained teachers play a central role in effective program implementation. Generally, the findings revealed that the program is feasible, considering that the challenges identified are addressed with dedication through strategic planning and adequate allocation of resources, a finding supported by Durlak and DuPre (2008), who found that careful implementation and resource allocation are strong predictors of program success.

Technical Study: Strategic Planning and Sustainability

The research discovered that the current resources within TPES were not sufficient to efficiently facilitate the implementation of the SSES Program. The educational needs survey emphasized the necessity of better laboratory facilities, newer instructional materials, and teacher development. These findings were also corroborated by information obtained during Key Informant Interviews (KIIs) with school administrators and teachers.

“One of the things maybe we are lacking is that of fully equipped laboratories in opening this kind of curriculum or special class in science.” (KII-AP1-L25-27)

“But I think based on the funds that we have right now, *hindi sya kaya or hindi makakasuffice* in establishing this program, just like laboratories, instructional materials, and other trainings for the teachers to have the expertise to teach this program.”(KII-AP2-L21-24)

“We need to have specialized teacher training before the implementation because that's one thing that we need to consider because we will be talking of curriculum and instruction.” (KII-AP1-L45-47)

“Need to have more trainings regarding SSES program, limited resources.” (KII-T1-L40)

Evaluation of Class Schedules

The existing class schedules at the school were reviewed to assess their ability to support the integration of the SSES Program. An Assistant Principal affirmed that modifications could be made to the schedules to incorporate the program without interfering with the current curriculum. He remarked:

"So in terms of class schedule, *siguro* there are a lot of changes, adjustment of time, but we are gonna make sure that the teachers and the students will have the quality lessons or the hours."(KII-AP2-L78-79)

While teachers shared similar sentiments, they emphasized the importance of balancing time for regular and specialized classes. For instance:

"For me, decongest irrelevant or reoccurring learning competencies in other different subject matters to efficiently focus on the knowledge that matters most." (KII-T2-L58-59)

"Fitting SSES into a busy schedule is hard. Making sure kids learn all subjects well is important. Sometimes SSES might take away time from other important classes." (KII-T4-L84-85)

"For sure*, mag ano din siya… magtetake ng* time for experiments or other projects. *So yun, siguro nagkakaroon ng* conflict but ahm… through thorough planning with the help of our School Admin and the Master Teachers of our school." (KII-T3-L64-67)

These findings indicated a collective commitment on the part of school leaders and instructors to make necessary changes, supporting the smooth incorporation of the program into the existing timetable. Research by Fullan (2016) highlights the importance of powerful collaborative leadership and organizational adaptability as key elements in the effective implementation of new educational programs.

Strategic Planning for Sustainability

The study proposed several strategic planning approaches to address resource gaps and ensure the program's sustainability:

1. Resource Mapping: The SSES program implementation is challenged in mapping the resources required to enable success. The Assistant Principals pointed out that integrating the program would demand substantial resources, particularly specialized teachers, which calls for a drastic change in the existing teaching structure. As they stated,

"For now, if you're going to ask me the current resources available, we have the MOOE and the SEF, the Special Education Fund, coming from the local government unit of Tacurong City."(KII-AP2-L19-21)

"Very supportive *naman siguro ang ating* local government unit, actually *kahit ang* provincial government unit, *napaka* generous *nila*, but as you know we need to study this first, we need to make sure that this program will be implemented well."(KII-AP2-L60-63)

"This is a big adjustment, *napakalaki* adjustment *sa* teachers especially we'll have the specialized teacher to teach these subjects."(KII-AP2-L74-75)

This shows the importance of accurately identifying the human and material resources required to implement the program effectively.

Capacity Building:

Capacity building is an essential component for ensuring the successful implementation and sustainability of the SSES Program. The Assistant Principals emphasized the need for careful planning in the integration of the new curriculum, stressing that:

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue VI June 2025

"This planning will serve as the blueprint of how we maneuver, how we are going to conduct the program effectively, and of course, it requires the extending of hours."(KII-AP1-L92-94)

“We have a lot of potential teachers, actually. But maybe since that we have this kind of offering, maybe we need to have trained teachers specializing, most especially in the science program.” (KII-AP1-L29-31)

“We need to make sure that the teachers are equipped, *kaya nila ituro yung* curriculum or program *na ito.”* (KII-AP2-L31-32)

This indicates the necessity of training and supporting both teachers and administrative staff to handle the new curriculum demands. Continuous professional development and adaptability will be crucial as the program evolves.

Infrastructure Development:

Infrastructure growth is still an important issue for the SSES Program's sustainability. Bridging gaps like poor physical and educational infrastructure, such as laboratories and teaching materials to accommodate the specialized curriculum in Science, will be instrumental in the program's sustainability over the long term. Though some comes from the Special Education Fund (SEF) and Maintenance and Other Operating Expenses (MOOE) given by the local government, this is not enough to sustain completely the infrastructure needs of the program. The Assistant Principal stated,

"Based on the funds that we have right now, *hindi sya kaya* or *hindi makakasuffice* in establishing this program,"(KII-AP2-L21-23)

However, the partnerships with external stakeholders are vital for the program's establishment and sustainability. The other school administrator stated,

“Actually you know ma’am, we are very lucky *kasi napaka raming mga* external stakeholders *nagbibigay dito, nagbibigay ng* support *sa atin,* actually other buildings coming from the external stakeholders like Security Bank, CSWD, so I think if we are gonna have this one, we will decide to put up this SSES program.” (KII-AP2-L57-60)

One of the teachers added,

“I’m positive *na… ahhh…* with the help of our stakeholders *masusurpass mo man yung* challenge. *Kapag malakas ang* support *ng* stakeholders like LGUs, *mga* agencies *sa mga* locality. *Ahhhmm… makakapagprovide sila ng* trainings *sa ating* teachers. *At tsaka mga* resources, *mga* materials, *mga* laboratories, equipments and other tools *para magamit sa* Science curriculum.”(KII-T3-L73-78)

In general, the collaboration between the NGO and local government shows a strong appreciation for their contribution to the success of the program. Participation of external stakeholders, local government support, and participation from NGOs and alumni are mentioned as main factors for setting up and sustaining the program. Yet, there are significant gaps in particular plans and examples of how these partnerships will be developed and used, indicating the necessity for more strategic planning to ensure that the utmost benefit possible from these collaborations is achieved.

Community and Institutional Partnerships:

Collaboration with NGOs, alumni organizations, and LGUs is integral to making the program sustainable. One of the Assistant Principals cited the need for such cooperation, stating,

“The strong partnership with our stakeholders and of course, the engagement. *Alam mo naman, maraming ding naman ng mga* non-government agencies or non-government organizations that are very helpful.”(KII-AP1-L187-189)

External stakeholders and the surrounding local communities are important ways and means through which supplementary resources, experience, and sponsorship for the program can be achieved. Cooperative work with external stakeholders and bodies will acquire the support needed for roll-out as well as ensuring the long-term sustainability of the program.

Innovative Scheduling:

The need for innovative scheduling was highlighted in the Assistant Principal's remarks about the adjustments required in class schedules to accommodate the new program. As he stated,

"Siguro there are a lot of changes, adjustment of time, but we are gonna make sure that the teachers and the students will have the quality lessons or the hours." (KII-AP2-L78-80)

This emphasizes that strategic planning will need to be invoked to modify current schedules so that adequate instructional time can be made available for the specialized courses without compromising other important avenues of learning. Flexibility in scheduling and accommodating teaching hours will facilitate this change.

Funding Strategies:

Securing sufficient funding is critical for the sustainability of the SSES program. The Assistant Principal emphasized the importance of reliable financial support, noting,

"Without adequate financial support, the implementation of the program could be severely hindered." (KII-AP1-L51)

Presently, the available funding sources—like the MOOE and SEF—are not enough to cover the program's entire requirement, particularly for specialized facilities and resources. A complete funding approach with both external and local sources of funding, including public-private partnerships, must be undertaken to guarantee the continuation and expansion of the program.

Community Involvement:

The participation of alumni, local organizations, and parents is paramount for the achievement and continuity of the SSES Program. The Assistant Principal indicated that alumni and local organizations already participate actively in school activities. The involvement of these stakeholders consistently will create an environment of ownership and support of the program such that it becomes a continued resource, and financial and non-financial resources can be tapped accordingly. Community involvement will assist in alleviating funding issues and offering extra human resources for program implementation.

Learning from Global Best Practices in STEM Education

Effective STEM programs in other parts of the globe, especially Singapore, Finland, and Australia, provide useful lessons for creating the SSES Program at TPES. Singapore's curriculum focuses on incorporating technology and problem-solving skills in real-world contexts, developing students as innovators at an early stage (Tayag, 2019). Finland, however, upholds rigorous teacher training and grants teachers the liberty to adjust instruction according to their students' requirements (Reeve & Tseng, 2011; Sahlberg, 2015). Australia, in turn, enforces early engagement in STEM through project-based and integrated learning methods, encouraging creativity and critical thinking in young students (Marginson et al., 2013).

Taking cues from these global models, two strategies stand out for TPES. First, ongoing investment in teacher training is necessary to develop the specialized skills required to implement an inquiry-based Science curriculum successfully. Second, optimizing the utilization of available resources—e.g., laboratory facilities, technological equipment, and learning materials—can assist in meeting infrastructure issues and maximizing student learning experiences even with limited budgets (National Research Council, 2011; OECD, 2016).

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue VI June 2025

By embracing these best practices, TPES can reinforce the SSES Program's implementation and align it with internationally accepted standards of science education. Strategic planning aimed at teacher capacity development and resource maximization will be key to building a strong, innovation-based learning environment that equips students to address future academic and practical challenges.

Proposed Phased Action Plan

The proposed Phased Action Plan as shown below serves as a structured guide for the effective implementation of the SSES Program, ensuring each stage—from planning to execution—is carried out with clear objectives, timelines, and opportunities for continuous refinement.

Table 6 Proposed Phased Action Plan

Phase	Timeline	Key Activities	Responsible Stakeholders	Expected Outputs
Phase 1: Planning and Preparation	Months 1–3	- Conduct needs assessment via surveys and FGDs - Stakeholder consultation with School Governance Council (SGC), PTA, LGU, and DepEd personnel - Design of SSES framework, curriculum, and selection process - Develop and launch promotional strategies for marginalized groups	School Head, SSES Focal Person, Research Committee, DepEd Division Office, LGU, Community Leaders	- SSES Program Plan - Baseline data - List of prospective students - Stakeholder support and commitment
Phase 2: Capacity Building and Resource Development	Months 4–6	- Conduct teacher training on STEM pedagogy and inclusive teaching - Procure updated instructional materials and laboratory tools - Prepare classrooms and science labs - Establish partnerships with HEIs, NGOs,	School Head, SSES Teachers, Property Custodian, Training Providers, Partners	- Trained teaching staff - Equipped laboratory rooms - MOAs or partnerships signed - Resource inventory completed

		and private sector		
Phase 3: Program Implementation	Months 7–12	- Pilot implementation of SSES program - Rollout of STEM-based instruction using localized and contextualized curriculum - Launch of science-related events (e.g., fairs, exhibits) - Ongoing support for learners and regular program reviews	School Head, Class Advisers, SSES Coordinator, Students, Parents, Community Volunteers	- Active class operation - Community engagement reports - Documented student progress
Phase 4: Monitoring, Evaluation, and Expansion	Year 2 onwards	- Continuous monitoring and evaluation (M&E) of program - Implementation of risk mitigation plans - Regular financial audits and reporting using MOOE and other funding sources - Gradual expansion of the program based on results	School Head, SSES Coordinator, School Planning Team, Division Monitoring Team	- M&E reports - Adjusted program design - Expanded SSES offerings - Sustained stakeholder support

The Proposed Phased Action Plan provides a strategic and systematic guide to the effective rollout of the SSES Program. Each step—planning, capacity development, implementation, and monitoring—guarantees that activities are undertaken with concentration, stakeholder involvement, and room for growth, ensuring program sustainability and impact.

The implication of this stage structure is threefold. The plan promotes collaborative decision-making by beginning with stakeholder involvement and needs assessment, which Fullan (2007) views as the most important element in successful education reform. The plan encourages collaborative decision-making by starting with stakeholder engagement and needs assessment, which Fullan (2007) highlights as the key to successful education reform. Phase 2 emphasis on professional development is consistent with Desimone's (2009) research that found intensive, content-relevant teacher training greatly enhances instructional quality and student outcomes. Additionally, continuous monitoring and adaptation are integrated in line with Guskey's

(2002) model, where the emphasis on assessing professional development and its impacts to guide further enhancements comes through. Finally, the engagement of local government units and community organizations is consistent with Epstein's (2011) school-family-community partnership framework, wherein collaborative networks enhance program implementation and mobilization of resources.

Overall, the proposed phased action plan has the potential to bridge resource disparities, improve instructional strategies, and foster inclusive, community-based science education.

Long-Term Monitoring and Evaluation Plan

To ensure the continued effectiveness and sustainability of the SSES Program at TPES, a structured long-term Monitoring and Evaluation (M&E) plan will be implemented. This plan aims to track progress, measure outcomes, address emerging challenges, and inform future improvements aligned with the program's objectives.

1. **Monitoring Mechanisms.** Monitoring will be done through frequent data collection, observation of classrooms, feedback from stakeholders, and progress reports. The KPIs that will be examined bi-annually are student performance in science, rate of participation, teacher performance, accessibility of resources, and satisfaction of stakeholders. This will be done by a specific M&E team made up of school officials, SSES coordinators, and members of the Division Monitoring Team.
2. **Evaluation Strategies.** Annual formal evaluations will be done to determine the impact of the program on student learning outcomes and instructional quality. Mixed-method evaluation instruments like pre/post-tests, portfolio, classroom walkthrough, teacher rating, and focus group interviews with students and parents will be employed. Evaluation results will be submitted to the School Governing Council and communicated to DepEd Division authorities to be used in strategic planning.
3. **Feedback and Continuous Improvement.** M&E findings will be utilized to enhance instructional strategies, adapt resource allocation, and guide professional development programs. There will be a feedback loop that engages teachers, students, and parents in joint decision-making so that the SSES Program can continue to be responsive to both education standards and community needs.
4. **Alignment with National and Global Priorities.** The sustainability long-term plan will remain consistent with national education policies like DepEd's MATATAG agenda, RA 10533, and the Philippine Development Plan 2023–2028, as well as international plans like UNESCO's Education 2030. Through this, TPES keeps the SSES Program adaptive, relevant, and future-focused.

Management Study: Risk Assessment and Mitigation Strategies

The study indicated that there were a number of significant risks likely to impede the effective implementation of the SSES Program in TPES. These included difficulties in obtaining necessary resources, inadequate training of teachers, and limited budget. However, the availability of specific mitigation plans and robust prevailing partnerships within the school community indicated potential for overcoming and resolving the challenges.

One of the major concerns was the acquisition of needed resources since the school has inadequate laboratory facilities, instructional materials, and technology tools required in a SSES program. Teachers confirmed these inadequacies through Key Informant Interviews (KII). They indicated,

"It is really challenging to teach science, especially during hands-on activities, because of some factors such as limited resources and time constraints." (KII-T4-L14-15)

"Another challenge is the materials to be used during lessons, textbooks, worksheets, other materials." (KII-T3-L16-17)

"The most important resources or shall I say facility that I/we really need is a science laboratory room that is conducive, well-ventilated and can accommodate up to 40 learners because it is very hard and exhausting

bringing this bunch of tools or equipment from one room to another and it will also consume a lot of amount time and energy from the teacher." (KII-T2-L33-34)

In spite of these gaps, the Department of Education (DepEd) strives to offer science-related activities and more resources, which have already helped enhance Science education in the school.

Another essential risk was a lack of teacher training. Teachers showed interest in the program but noted that they needed capacity building to effectively implement the specialized curriculum. The absence of specialized science education training is an essential issue that impacts teachers' confidence and capability to provide effective science teaching. Teachers clearly stated they need further training to plug in gaps of skills and knowledge so that the programs of science will be successful. For example, one of the teachers during interview stated,

"Need to have more trainings regarding SSES program, limited resources," (KII-T1-L40)

It highlighted the necessity for more comprehensive training. Similarly, another teacher stated,

"With my background, I don't think I will be confident to handle SESS Program Science subjects unless I undergo special trainings or courses that will help me qualify for teaching the program," (KII-T3-L27-29)

Another respondent echoes the same feeling, citing that she would like training in curriculum and instructional strategies, as she said,

"If given a chance, maybe trainings that are more on curriculum, more on strategies on teaching science." (KII-T5-L44-45)

Generally, there is an agreement from teachers that they need specialized training to upgrade their teaching competence and tackle the problems they encounter in Science education.

Budget constraints were also an ongoing problem, especially for facilities upgrades, acquiring instructional materials, and paying for teacher training. The two Assistant Principals indicated this as the problem:

"Pag wala kasi tayong pera, sometimes, *ito yung maghi-hinder. Bakit hindi natin maku-push* through *yung* program implementation." (KII-AP1-L174-175)

"If we will be relying all in the Department of Education, yes, *may mapuprovide,* but then somehow on a limited basis."(KII-AP1-L192-94)

In conclusion, the findings unveiled important risks that significantly challenge the successful adoption of the SSES Program in TPES. These are insufficient learning resources, lack of teacher training, and recurrent budgetary constraints. These limitations discourage the provision of quality science teaching, especially in a program that focuses on inquiry-based learning and experimentation. Teacher feedback from the Key Informant Interviews underscored the urgent need for a well-equipped laboratory, accessible learning materials, and professional training to address the needs of the curriculum. Without these support structures in place, the desired outcomes of the SSES program—such as enhancing learners' scientific literacy and higher-order thinking—are not likely to be fully achieved.

The findings of this study are echoed by an emerging body of research highlighting the crucial role of sufficient resources and teacher capacity in the effectiveness of specialist science programs. Darling-Hammond et al. (2017) stressed the significance of ongoing, high-quality professional development in improving teaching practices and student outcomes. In the Philippines, Salandanan (2011) posited that every curriculum reform effort, especially science, should be complemented with the ongoing upskilling of teachers to enhance implementation fidelity. Bernardo (2004) also emphasized the importance of context-specific teacher training and sufficient material support to impart outcomes-based science instruction effectively. A study by SEI-DOST and UP NISMED (2011) also emphasized further that enhancing science education in basic education

does not only involve curriculum redesign, but also the alignment of teacher qualifications and facility standards.

In spite of the constraints identified, the presence of positive school-community relationships and preliminary risk mitigation measures offer a platform on which improvements can be established. Hence, the effective implementation of the SSES Program in TPES depends on deliberate and consistent resource provision, specific professional development, and collective engagement among stakeholders at all levels.

Mitigation Strategies

Implementation of the Special Science Program relies on various key strategies for success. These are sustaining capacity building initiatives, strengthening stakeholder collaboration and communication, maximizing community engagement and external partnerships, optimizing resource management, and promoting program visibility and value. By adopting these strategies, the school can successfully address challenges and achieve the sustainability and success of the program. To reduce these risks, the study suggested various strategies:

Sustaining Capacity Building Initiatives:

Regular professional development was recommended to address the identified gaps in training opportunities. Regular, focused workshops are suggested, focusing on the SSES program, innovative teaching practices, and science content knowledge. These training sessions should also involve school leaders and parents to create a supportive community. Capacity-building programs can best respond to instructional needs and ensure that all the major stakeholders are adequately equipped to help drive the program to success.

Strengthening Stakeholder Collaboration and Communication:

One usual recommendation is to develop a shared vision among parents, school leaders, teachers, and students. Facilitating open lines of communication through frequent meetings, parent involvement activities, and school forums can advance collective decision-making, transparency, and shared understanding of objectives. This collaborative environment helps bring about better resource sharing, faster problem-solving, and more long-term implementation of the SSES program.

Maximizing Community Engagement and External Partnerships:

Because of continuing budget limitations and lack of resources, it is strongly suggested to actively involve the community and form linkages with Local Government Units (LGUs), Non-governmental Organizations (NGOs), and science-oriented institutions. These linkages can offer funding, technical expertise, and materials not readily available within the school system. Community involvement through activities like science fairs promotes ownership and ensures program sustainability.

Optimizing Resource Management:

An accurate listing of available materials and facilities identifies shortfalls and maximizes utilization of present school resources. Implementing incremental steps to design viable science classrooms, recycling unused areas, and coordinating strategic resource distribution can cover budget deficits and enhance the learning environment without significant capital investments.

Promoting Program Visibility and Value:

Promotional efforts like school orientations, science fairs, and student involvement in academic activities are crucial for creating awareness and support for the SSES. By highlighting the program's connection to future STEM opportunities, these efforts can drive enrollment, justify continued investment, and obtain stakeholder support.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue VI June 2025

Mitigating potential risks is important to ensure sustainability and success in all program implementations. The following table shows the significant risks identified in the feasibility study, the related mitigation strategies, the resources required, and the respective entities. This anticipated step ensures proper challenge mitigation and program goal alignment.

Table 7 Risk Mitigation and Strategies

Risk	**Mitigation Strategy**	**Resources Needed**	**Responsible Party**
Securing necessary resources	Partner with NGOs for donations and expertise	Proposal documents, partnerships with NGOs	School head, PTA, external liaisons
Insufficient teacher training	Organize professional development workshops for STEM teaching	Trainers, training materials, funding for workshops	School head, teachers
Financial constraints	Diversify funding sources (DepEd grants, LGU allocations, private sector sponsorships)	Proposal documents, financial resources	School head, PTA, external liaisons

The mitigation strategies identified to respond to the significant risks uncovered during the feasibility study are as follows:

1. **Securing Necessary Resources**: To respond to resource deficiencies, collaboration with Non-government Organizations (NGOs), Local Government Units (LGUs), and other stakeholders is significant. These partnerships will be created through proposal papers, partnership contracts, and outside support in terms of donations and expertise. It is the responsibility of the DepEd, NGOs, and LGUs to secure the required resources and ensure a steady supply of support so that the program's needs are met.

2. **Insufficient Teacher Training:** To address the problem of poor teacher training is to stress the importance of planning workshops and training sessions specifically about STEM studies. The necessary resources include external trainers, training materials in curriculum guides and STEM kits, and venues and scheduling tools to make it easy to organize the sessions. The school head, external trainers, and instructors will collaborate to offer practical training, increasing teachers' preparedness for the specialized curriculum.

3. **Financial Constraints:** To cope with financial limitations, the school will team up with stakeholders and NGOs regarding funding securing. Proposal papers, funds in the form of DepEd grants, LGU funds, private sector sponsorships, and fund-raising aids in grant requests and donor pitches are the required resources. School heads, external liaisons, LGUs, and private sector sponsors will monitor these funding resources to ensure the program's fiscal viability.

4. **Resistance from Stakeholders:** To respond parents' and public resistance, the strategy involves having regular consultations, orientations, and feedback sessions in order to build trust and maximize transparency. Materials needed for the strategy include communication materials like pamphlets, flyers, internet platforms for updates, and materials for event planning, like booking venues and calendars. Feedback gathering mechanisms like questionnaires and surveys will also be put in place. The school administration, teachers, school head, Parent-Teacher Association (PTA), and community leaders will take charge of these activities so everyone concerned will be informed, engaged, and supportive.

The school systematically deals with potential risks to build a solid foundation for effective implementation. Through collaboration with outside partners, providing in-depth teacher training, and working with stakeholders in advance, the school creates an environment that enables it to overcome challenges. This promotes long-term sustainability and success for the program.

IV. Financial Study: Financial Projections and Cost- Benefit Analysis

The financial analysis addressed the feasibility of establishing the SSES Program in TPES by analyzing the budget needed, considering prospective sources of funding, and conducting a cost-benefit analysis. As a pilot public basic elementary school, TPES receives a large sum of Maintenance and Other Operating Expenses (MOOE) funding as assigned based on its number of students, teaching staff, and classrooms.

Detailed Budget for the Program

The program's financial requirements were grouped into major components, with emphasis on leveraging available resources and pursuing available funding sources. The estimated budget is presented in Table 8.

Table 8 Proposed Budget Allocation Matrix for Establishment and Costs of the SSES Program at TPES

Cost Category	Initial Establishment Cost	Estimated Cost	Funding Source
Laboratory Equipment/Materials	Science Experiment tools and materials	1,000,000	School MOOE/Donation from Stakeholders
Teacher Training Workshops	Training of existing staff	200,000	School MOOE/Donation from Stakeholders
Operational Costs (Maintenance)	Maintenance Expenses	300,000	School MOOE/Donation from Stakeholders

Staffing costs were not included in the budget as the existing teachers responsible for Fast Learner sections would be implementing the program. Therefore, top priority was given to teacher training to prepare them for the specialized science program. The highest investment identified was laboratory equipment and teaching materials, which account for half the budget. The rest covers operational and maintenance costs.

Funding Sources

The school benefits from a strong financial foundation and a robust network of partnerships supporting the SSES Program's implementation. Internally, the school's financial stability is enhanced by the regular allocation of MOOE funds, which can be effectively used to fulfill the operational and instructional requirements of the SSES Program. In addition, other financial sources, such as grants from the DepEd for specialized programs like the SSES, provide valuable support. LGUs, particularly through the SEF, are potential benefactors, especially in meeting infrastructure and resource needs.

Besides financial support, the school also enjoys strong external assistance from symbiotic partnerships with private entities, LGUs, NGOs, and actively participating alums. These collaborations contribute material and

infrastructural support and manifest a broad support system critical to program sustainability. Alumni engagement expresses a true sense of community participation and dedication to educational progress. The school administration is proactive and open in creating partnerships and responsibly overseeing the execution of programs. Strategic actions like benchmarking with comparator schools and ongoing capacity building are utilized to ensure effective and sustainable implementation. Through internal capacities and external partnerships, the school has a strong position to carry out the SSES program and establish a sustainable science education model.

Cost-Benefit Analysis

The cost-benefit analysis demonstrates that SSES is also ready to contribute notable long-term benefits that surpass its initial cost. Student interest and science performance will be immensely increased under the program, with the survey determining that 85% of learners indicated enthusiasm at having the chance to engage in inquiry-based hands-on science learning activities. This passion should yield more Science-related competencies, which are important to high school STEM-dominant track success. Additionally, teachers have described professional workshops as applicable in their teaching competencies, which will affect student performance accordingly.

The table below indicated the Cost Analysis for SSES Program Implementation at TPES:

Table 9. Cost Analysis for SSES Program Implementation at TPES

Category	Description	Estimated Share of Budget
Laboratory Equipment & Materials	Purchase of science apparatus, tools, consumables, and lab setup.	~50%
Instructional Materials	Science workbooks, modules, visual aids, and digital content.	Included in above
Teacher Training	Capacity building for teachers on specialized science instruction.	Moderate
Operational & Maintenance Expenses	Utilities, equipment upkeep, logistics, and minor repairs.	Remaining 30% (approx.)
Staffing	*No additional costs* – existing teachers will handle SSES classes.	—

Implementing the SSES Program in TPES calls for investment across various areas, but most prominently in laboratory materials and learning resources that will take up around 50% of the program's budget. These expenses capture the necessity of sufficient resources to promote experiential learning in science, which is crucial to students' success in expert subjects such as science (UNESCO, 2015). In addition, the expense of instructional materials (textbooks, workbooks, and online materials) is included in this allocation. Materials are critical to facilitate the curriculum so that lessons are interesting and informative, a key to effective teaching in specialized programs, as identified by the OECD (2016).

Teacher training is also a significant cost factor. Educating teachers in a specialized science curriculum provides them with critical pedagogical and subject matter knowledge. Darling-Hammond et al.

(2017) report that effective professional development greatly increases teaching effectiveness, particularly for complex subjects such as science.

In addition, operational and maintenance costs, such as utilities, logistics, and minor repairs to the school facilities, constitute the other 50% of the estimated costs. These costs guarantee that the program's day-to-day activities are smooth and sustainable in the long term. Bartik & Duncombe (2015) state that financing these recurring operational costs is essential in ensuring the program's quality and sustainability.

Because no extra teaching staff needs to be employed for the SSES program, the staffing costs are relatively low. The existing teachers will be trained and redeployed to the new program, and the school's existing personnel can be utilized, which is a good cost-saving strategy, as supported by the study of the OECD (2016).

The table below shows the Benefit Analysis for SSES Program Implementation at TPES:

Table 10.Benefit Analysis for SSES Program Implementation at TPES

Benefit Area	Description	Impact Level
Enhanced Learner Achievement	Specialized curriculum fosters critical thinking, scientific inquiry, and academic excellence.	High
Teacher Professional Growth	Teachers gain training in advanced pedagogy and science content, enhancing overall instructional quality.	Moderate to High
Community and Stakeholder Support	Strong alumni, LGU, NGO, and private partner engagement promotes sustainability and shared responsibility.	High
Institutional Prestige	Being a pilot school for SSES boosts the school's profile and attracts more high-performing learners.	High
Cost Efficiency	Use of existing personnel and MOOE allocation reduces need for major new investments.	High

In addition, the advantages of having the SSES Program supersede the cost, providing outstanding positive results for the school and community. The most substantial advantage is increased learner achievement, as science programs enable learners to exercise critical thinking, and scientific inquiry profoundly impacts academic performance in the STEM fields. As supported by Hattie (2009), specialized curricula maximize student outcomes, particularly in priority subjects like Science.

The second important benefit is the professional development of teachers. Teachers gain essential competencies in effective teaching strategies by undergoing professional development that caters to specialized teaching of Science. More quality of instruction is required because Darling-Hammond et al. (2017) prefer the idea of building stronger instruction as one of the most effective means of bolstering student success.

Strategic backing by local stakeholders like alumni, LGUs, NGOs, and private entities ensures a firm support system that ensures the program's sustainability. Epstein (2011) states that engaging various stakeholders is at the core of ensuring maximum success and duration of educational programs. Engaging such groups creates shared responsibility and continued cooperation, which are vital to the program's long-term success. The program also offers a chance to increase the institution's reputation within the school. Certification as a pilot school for a specialty science program brings in high-achieving students and adds prestige. Bartik & Duncombe (2015) say that specialty programs yield higher enrollment and add prestige to the institution.

Lastly, the program's cost-effectiveness is a valuable advantage. The school minimizes huge new investments using resources such as MOOE and available staff. This cost-effective measure guarantees the program's sustainability while maintaining high-quality learning outcomes. UNESCO (2015) advocates maximizing available resources to develop sustainable learning programs.

Generally, the TPES' SSES Program is a cost-efficient and beneficial investment in the school's future. By strategically utilizing available funding resources such as MOOE, DepEd grants, and LGU donations, the school could adopt the program without overloading its resources with an excessive financial burden. The program's benefits—such as improved academic performance, enhanced teacher development, and enhanced support from the community—are well worth its expense. Besides, the school's reputation and cost-effectiveness from accessing these resources ensure the program's sustainability and long-term impact.

V. Socio-Economic Study: Ethical and Socio-Cultural Considerations in Educational Projects

As a pilot school for the SSES Program, TPES is at the forefront of an endeavor that has the potential to bring revolutionary goodness to the community. The program seeks to fill a critical niche in science and technology education in Tacurong City by providing students with improved learning opportunities in science and technology. The program aims to realize the community's vision for educational progress and sustainable socio-economic development.

The Principal's Assistant articulates a strong, long-term vision for the special science program that is optimistic about building up the reputation of the school and creating future scientists through the program, saying,

"Well, actually we are excelling. We have a lot of students who are excelling in science, especially passers of the Philippine Science High School. And even with the division programs like RFOT, the SPC in science and technology writing. So *napaka maraming* potential with our school. And establishing this kind of program in long term I think we could achieve, we can make the school brighter or *mas kilala pa* in terms of Science programs. So maybe we don't know, we can have scientists coming from our school, famous developers or a lot of things."(KII-AP2-L105-113)

However, the roll-out can also be challenged in aligning its goals with local socio-cultural values, necessitating careful stakeholder engagement to achieve relevance and inclusivity. As one of the Assistant Principals explained, there is a requirement for collective comprehension and shared vision to respond to these challenges, adding adequately,

"But I know with understanding, with letting them understand what's happening and making sure that we are on one vision, the teachers, the students, and the stakeholders, we can achieve these things that we want to achieve." (KII-AP2)

This implies that having all stakeholders united by a common purpose is an influential determinant of program continuity in adversity. As much as this finding is qualitative and does not contain specific steps, it remains applicable to program sustainability by emphasizing collective commitment.

Integrating the specialized science curriculum into the existing education structure poses challenges, particularly in balancing the new material with what is already commonly taught. Teachers underscored that adopting the SSES curriculum would require additional training and proper resources. As put by one of the teacher-respondents:

"I believe a well-designed building for SESS Program is a big help to handle sections in all levels and to be able to achieve the main goal of the program.

If the program shall be established in TPES, I believe the readiness of the school will be challenged- the building/classrooms/laboratories to be used, the readiness of the teachers who will teach the specialized curriculum, the tools and materials." (KII-T3-L33-34-L48-50)

While the program has been widely endorsed, some community members have raised concerns regarding its perceived exclusivity. It is important to frame the program as an addition to existing educational options and not a replacement, to promote increased acceptance by the community.

Ethical and Socio-Cultural Strategies

To address these challenges, the research recommends the following strategies:

1. **Equitable Participation and Inclusiveness:** The TPES SSES Program must implement open and participatory admission procedures considering all students' socio-economic status to promote equality. Criterion clarity, comprehensive information dissemination, and provision of facilities for disadvantaged pupils will also promote equality and undo elitist images (UNESCO, 2015).
2. **Cultural Sensitivity and Community Engagement:** Successful implementation requires long-term collaborations with parents, community leaders, and cultural stakeholders. Co-design of program components with these stakeholders will ensure the SSES curriculum is culturally congruent with local values, more relevant, and community-owned.
3. **Ethical Leadership and Stakeholder Participation:** The program should be governed by a local advisory committee composed of school officials, teachers, parents, and LGU members. Such an organizational structure provides ethical decision-making powers for admissions, resource utilization, and teacher assistance, which are prime factors of success in the public sector (OECD, 2016).
4. **Complementary Framing of the Program:** The SSES initiative should be presented as an addition rather than a replacement for existing programs. By emphasizing advantages to all students—e.g., additional resources and teacher training—TPES can reduce opposition and build wider community endorsement.
5. **Teacher Training for Inclusive Education:** Inclusive pedagogy and cultural responsiveness professional development are important. TPES teachers realize the need for training to execute the SSES curriculum, and targeted training will strengthen instruction quality and school culture (UNESCO, 2024).
6. **Open Communication and Trust Building:** A successful communications strategy—regular reporting, forums, and lines of feedback—will keep confidence and participation with stakeholders. Transparency will ensure participatory knowledge and avoid the chances of miscommunication.
7. **Contextual and Culturally Relevant Learning:** Including local issues, knowledge, and contexts in science education will increase relevance and learning. It will decrease cultural bias, legitimate local culture, link STEM to daily life, and facilitate science for community development.
8. **Ethical and Cultural Impact Monitoring and Evaluation:** TPES must regularly assess the SSES program's academic and socio-cultural impact through inclusive feedback mechanisms. It ensures the program remains ethically founded and inclusive and is in DepEd's priorities and community values.

The TPES' SSES Program has high potential to enhance Tacurong City STEM education, which results in educational development and local economic growth. Nevertheless, its success would depend on the alignment of the program with local socio-cultural values and inclusivity. Research has testified that culturally sensitive and inclusive programs are more accepted. According to the report of the OECD (2017), effectiveness is the key, highlighting the significance of achieving consequential outcomes. Teacher training and involvement from the community are essential for the program's success, as proven in research on effective STEM education practices (UNESCO, 2024). TPES, being the pilot school, can take the initiative by adopting ethical and socio-cultural methods so that the learning becomes sustainable in the long run and beneficial to the student community and the community at large.

VI. On the Decision to Implement the Proposed Special Science Program

Based on the results of the study, the implementation of the SSES Program at TPES is feasible and financially sustainable. The mass support from teachers, parents, and students testifies to the demand and preparedness for the initiative, making it a monumental leap in the school's educational advancement.

Based on the findings, adopting the proposed SSES Program at TPES, as a pilot school is both a sound strategy and a socially responsible action.

The advantages—ranging from increased student participation in science and better teacher expertise, to community empowerment in the long term—exceed the projected costs and challenges. With most students

revealing interest in experiment-based science activities and instructors highlighting the importance of capacity-building workshops, the program showcases high potential for sound academic and developmental impacts. The articulated socio-cultural and ethical strategies—like inclusive admission policies, contextualized learning techniques, open governance, and continued community involvement—outline a clear pathway to responsible action. These actions solve concerns regarding exclusivity and promote alignment with community values, thus building strong community trust and stakeholder backing.

Considering the strong evidence of educational benefits and community support, implementing the SSES Program at TPES is recommended. The project offers a chance to pilot an inclusive, contextually grounded, and ethically regulated STEM program in Tacurong City. International guidelines (UNESCO, 2024) indicate that investing in STEM learning through local innovation and capacity building enhances individual student development and overall socio-economic progress. With careful planning and observation, TPES can serve as a model for expanding science-oriented education to similar contexts.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

On the Market Study: Educational Needs and Market Analysis

Based on the gathered data, students, parents, and teachers highly support the proposed SSES Program, with students especially enthusiastic about hands-on, inquiry-based science learning. While there is optimism about the program, issues like resource limitations, time limitations, and technical training requirements must be resolved. With proper planning, deployment of resources, and personnel training, the SSES program can significantly enhance science education and inspire more student interest in STEM activities at Tacurong Pilot Elementary School.

On the Technical Study: Strategic Planning and Sustainability

The data showed various resource deficiencies, including poor laboratory facilities, fewer instructional materials, and teacher training. These issues can be solved with strategic planning and capacity-building strategies. The school's leadership showed a desire to work together with stakeholders and modify schedules to ensure the effective integration and sustainability of the SSES program.

On the Management Study: Risk Assessment and Mitigation Strategies

Based on the data collected, the research found several risks that may hinder the effective rollout of the SSES Program at TPES, such as resource acquisition challenges, inadequate teacher training, and funding limitations.

Mitigation measures like ongoing capacity development, enhancing stakeholder coordination, and building community support are strong platforms for overcoming these risks. With proper planning, resource management, and strategic alliances, the program can be successfully initiated and maintained at the school.

On the Financial Study: Financial Projections and Cost-Benefit Analysis

Based on the information gathered and the financial analysis, implementing the SSES Program at TPES is considered financially viable. Funds are sourced through the school's MOOE and DepEd grants, coupled with solid external linkages, which guarantee the program's viability. While initial investments in laboratory equipment and teacher training are necessary, these costs are eventually justified by the program's eventual benefits. The projected enhancements in students' academic achievement, especially in STEM fields, and the career development of instructors and strong community support highlight the program's promise for positive and sustainable impact on the school and its stakeholders.

On the Socio-Economic Study: Ethical and Socio-Cultural Considerations in Educational Projects

The study underscored the program's potential to narrow education deficits through high-quality and inclusive STEM learning experiences, especially for underprivileged groups. Ethical issues—like fair access, fair selection procedures, and cultural sensitivity—were addressed in ways suggested for active stakeholder, community, and shared ownership participation. These measures aspire to produce an environment that guarantees fairness, appropriateness, and sustainability in program implementation.

On the Decision Implementation

The study strongly supports the implementation of the SSES Program at TPES emphasizing its feasibility, sustainability, and alignment with both educational goals and community needs. With broad support from stakeholders and clear evidence of demand and readiness, the program presents a strategic and socially responsible initiative. The expected benefits—such as enhanced student engagement in science, improved teacher competencies, and strengthened community involvement—significantly outweigh the challenges. By embracing inclusive, ethical, and context-based approaches, TPES has the potential to become a model for science education reform in underserved areas. Implementing the SSES Program not only advances academic outcomes but also contributes to long-term socio-economic development, making it a timely and impactful educational investment.

The study provides evidence that the suggested SSES Program is doable and manageable. It aligns with the school's goal and mirrors the community's vision. Installing the program will strengthen STEM teaching and equip learners for future demand.

Recommendations

Based on the findings, the following recommendations are proposed to ensure the successful implementation and sustainability of the SSES Program at TPES:

Market Study: Educational Needs and Market Analysis

Proceed with implementing the SSES Program, as a high percentage of learners and parents demonstrated interest and support for a specialized science curriculum. Continue stakeholder engagement through periodic consultations, surveys, and focus groups to maintain community alignment and adapt to evolving educational needs. Develop orientation programs for students and parents to clarify expectations and encourage broader participation.

Technical Study: Strategic Planning and Sustainability

Prioritize laboratory development and the acquisition of instructional materials to address the technical needs of an inquiry-based science curriculum. Redesign the school schedule to accommodate more extended class periods for science and project-based learning activities while ensuring adequate instructional time without compromising core subjects. Implement a sustainability framework that encompasses teacher capacity development, collaborations with local government and NGOs, and infrastructure strategic planning.

Management Study: Risk Assessment and Mitigation Strategies

Implement a comprehensive risk management strategy to address resource constraints, teacher capacity needs, and enrollment fluctuations.

Strengthen community and stakeholder collaboration to reinforce support and resource sharing, especially with the PTA, LGU, and alumni associations. Launch a communication strategy that fosters transparency, builds trust, and encourages community ownership of the program.

Financial Study: Financial Projections and Cost-Benefit Analysis

Utilize existing funding from the MOOE, SEF, and DepEd grants for initial implementation, with transparent allocation for laboratory equipment, teacher training, and materials. Diversify funding sources through securing sponsorships and collaborations with the private sector and NGOs in addition to government appropriation. Build financial monitoring mechanisms for effective resource utilization and constant assessment of cost-benefit results, proving the long-term worth of the program.

Socio-Economic Study: Ethical and Socio-Cultural Considerations

Adopt inclusive and transparent selection criteria to ensure equitable access, particularly for students from marginalized backgrounds. Infuse the science curriculum with local context, integrating community issues and cultural knowledge to enhance relevance and acceptance. Create an advisory body with representation from parents, teachers, LGUs, and school administrators to ensure ethical governance and stakeholder voice in decision-making.

Decision on Implementation

Implement the SSES Program at TPES, beginning with a pilot section in grade levels included in the program, as the feasibility study confirms strong technical, financial, and community support. Follow a phased implementation plan, beginning with groundwork (training, preparation, stakeholder alignment), then program launch, culminating in monitoring, evaluation, and scaling. Document and evaluate pilot outcomes, allowing adjustments before full-scale implementation across all relevant grade levels.

Furthermore, the proposed SSES program at TPES presents a viable and impactful solution to the existing gaps in STEM education. Its successful implementation, supported by the proposed strategies, will improve the region's scholarly performance and long-term education and socio-economic development. Quality planning, proactive stakeholder engagement, and priorities for inclusiveness and ethical considerations will underpin the program's sustainability and positive outcomes.

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