

Original Article

# Advancing Vocational Education in Colonial Philippines: The Sociedad Económica de los Amigos del País and the Establishment of Escuela Profesional de Artes y Oficios

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## Abstract

**Background:** Philippine historiography has not given much attention to the history of engineering education in the country. This study considers vocational and technical education during the Spanish colonial period as a foundation of engineering education. It examines the role of the Sociedad Económica de los Amigos del País and, later, the Escuela Profesional de Artes y Oficios in promoting vocational and technical education.

**Methods:** This study utilizes primary sources, such as laws related to the Sociedad, reports from former directors of the Escuela found in online archival repositories, and secondary sources for contextualization.

**Results:** Findings reveal that the Escuela, institutionalized vocational and technical education by integrating theoretical and practical training in engineering and industrial skills. Most of the school's faculty were military engineers or officers who shaped students' competencies. Enrollment trends indicate a strong demand for vocational education, although completion rates remained low.

**Conclusion:** The establishment of the Escuela reflects Spain's economic motivations and its alignment with global trends in industrial education. It served as a foundational institution bridging traditional apprenticeship and formal technical training.

## Keywords

Sociedad Economica de los Amigos de Pais, Escuela Profesional de Artes y Oficios, science, technology, engineering education, Philippine engineering historiography

## INTRODUCTION

Globalization necessitates research, creativity, and innovation as “thresholds into new and beneficial possibilities” (Reader, 2006, p. 16). With the vast array of works and outputs, one can recognize engineers as the movers of globalization. As Martin and Schinzinger (2005), engineers “make possible spectacular human triumphs once only dreamed of in myth and science fiction” (p. 1). These ‘triumphs’ include innovations in contemporary life – food production, shelter, energy, communication, transportation, and health, among others (Diebold, 1990; Handley et al., 2012). Historians have been mindful of these contributions; thus,

engineering history and historiography have seen spectacular development. This development ranges from infrastructure studies to engineering education, knowledge, and realizations (Picon, 2004).

Frederick Fox (1976) once noted that while “only the great industrial nations were beginning to make truly broad use of formal preservice job preparation,” vocational and technical education in the Philippines was seen “to have been genuinely substantial” (pp. 186–187). Despite this, the place of vocational and technical education in Philippine historiography has been bypassed (Ay-ad & Aguilar, 2021). This article attempts to contribute to the condition thus described. It historicizes the beginning of engineering education by establishing various vocational and technical schools, specifically schools of arts and trades, in the Spanish colonial Philippines. This article starts with changes in the educational system in the colony, particularly the institutionalization of technical and vocational education brought about by the Sociedad Economica de los Amigos del Pais. The article then proceeds to the history of *Escuela Profesional de Artes y Oficios*. Aside from presenting a historical account, this article attempts to reconstruct the educational programs associated with the Sociedad Económica de los Amigos del Pais; and the Escuela as an educational institution during the last quarter of the 19th century.

The lack that Ay-ad and Aguilar (2021) pointed out should challenge Filipino historians and engineers. This collaboration between historians and engineers may align with the call made by the renowned American engineer and historian Henry Petroski. He stated:

Although helicopters may have replaced ramps for erecting obelisk, and computers may have made possible designs beyond the calculational reach of engineers only a generation ago, there are fundamental aspects of the conceptual engineering design process that have changed little (if any) over millennia. In fact, the ready availability and power of the tools of modern technology may even threaten to erode somewhat the more basic conceptual engineering skills. Ironical as it may seem, we might find an antidote to the erosion of fundamental design skills and critical engineering judgment more steadily in some of the oldest volumes on engineering than in the most modern textbooks. Such promise argues strongly for a proper infusion of history into engineering curricula (Petroski, 1992).

Indeed, the current endeavor would require collaboration between engineering educators and historians. Aside from the ‘benefits’ of engineering history to engineering students expressed by Petroski (1992), it is also to be expected that a historically informed engineering education would lead students to a sustainable and socially just engineering practice.

Emphasis will be placed on the *Escuela Práctica Profesional de Artes y Oficios* in Manila as a case study since it was the largest and located at the center of colonial power in the Philippines. The operations of this particular school can also represent the other *Escuela de Artes y Oficios* in the Archipelago, as the colonial government only approved the course of study offered by these institutions.

## METHODS

The current study has employed research methodology in history. A great deal of a historian’s work is dedicated to interpretation. As Hayden White (1973) puts it:

The historian has to interpret his materials in order to construct the moving pattern of images in which the form of the historical process is to be mirrored. And this because the historical record is both too full and too sparse.

Historical interpretation or ‘reconstruction’ requires, first and foremost, the use of primary and secondary sources. The British historian Arthur Marwick (1970) defines primary sources as “sources which came into existence during the actual period of the past which the historian is studying, they are those relics and traces left by the past”, while secondary sources are defined as “those accounts written later by historians looking back upon a period in the past”.

The researcher benefited from the documents provided by online repositories *Biblioteca Nacional de España* and *Portal de Archivos Españoles*. From the former, the researcher gathered the *Memorias* prepared by the Escuela’s directors from 1891 to 1895. These documents provided rich information about the operations of

the Escuela over the five years leading up to the Philippine Revolution of 1896. The statistics accompanying the reports also proved helpful in creating historical reconstruction. In the Portal, the researcher found several handwritten documents about the Escuela and some official documents related to the *Sociedad Economica de los Amigos del Pais*.

### **The Sociedad Economic De Los Amigos Del Pais and Technical-Vocational Education**

Education had been vital in creating obedient and loyal subjects of the Spanish Empire. Such importance was echoed in a long list of royal decrees by Spain about the education of the natives ([Hardacker, 2012](#); [Schwartz, 1971](#)). As time passed, some of these decrees called for reforms in the educational system. The Enlightenment in Europe paved the way for these changes. The former helped create a new class (i.e., *principalia*) that would challenge the colonial hegemon and accommodate the realization of Spain's mercantilist longings. As historian [Hornedo \(2001\)](#) puts it,

"Whoever unloaded most goods into the world market reaped the most significant benefits. To maximize production, the Enlightenment men believed in scientific research and the systematic support of such research to build development projects on scientific grounds."

An example of these "Enlightenment men" was Jose Basco y Vargas, who governed the islands from July 1778 to November 1787. During Basco's administration, agriculture, commerce, and industry developments received a strong impetus ([Cushner, 1971](#); [Diaz-Trechuelo, 1963](#)). This impetus was, in a significant sense, due to the "General Economic Development Plan" that Basco implemented. This plan was envisioned to make the Philippines economically independent from Mexico. [Legarda \(1999\)](#) summarizes Basco's works rather comprehensively.

He sought to encourage agriculture and industry by offering prizes to those who excelled in cultivating cotton, mulberry trees, and spices such as cloves, cinnamon, pepper, and nutmeg; to those who established factories for the processing or production of silk, porcelain, hemp, linen, and cotton; to those who produced inventions useful to the state; and to those who distinguished themselves in the sciences, the liberal arts, and the trades. He distributed instructions on cultivating and processing cotton, silk, sugar, and other products. He also proposed reforming the galleon trade's boleta system by having boletas sold by royal authority to genuine merchants at one hundred pesos each.

In 1781, Basco established *Sociedad Economica de los Amigos del Pais* through the royal decree dated 27 August 1780, which was issued as a result of consultation by interim Governor-General Pedro Sarrio on 30 April 1779 ([Expediente de La Sociedad Económica de Filipinas, n.d.](#)). However, there were times when the Sociedad Economica was practically dead despite accomplishments during its activity ([Corpuz, 2005](#); [Fernandez, 1932](#)). Thus, a royal decree dated 6 April 1821 was created ordering the restoration of the Sociedad Economica de Filipinas ([Estatutos de La Real Sociedad Economica de Las Islas Filipinas, 1852, p. 12](#)). Article I of the [Estatutos de la Real Sociedad Economica de las Islas Filipinas \(1852\)](#) provides that,

*La Sociedad Economica de las Islas Filipinas establecida en su capital, tiene por principal objeto la prosperidad publica, procurando por todos los medios que esten a su alcance, los mayores conocimientos en la historia natural, el fomento de la agricultura, el progreso de las artes, y el adelantamiento del comercio, estendiendole a todos los renglones que su terreno privilegiado, su situacion ventajosa y sus relaciones con el resto del mundo ofrecen el dia a sus habitantes.*

The Economic Society of the Philippine Islands, established in its capital, has as its primary objective public prosperity, seeking by all means at its disposal the most significant knowledge in natural history, the promotion of agriculture, the progress of the arts, and the advancement of commerce, extending to all the areas that its privileged terrain, its advantageous location and its relations with the rest of the world offer to its population.

The period sought to apply theories and speculations elaborated in the earlier centuries ([Diaz-Trechuelo, 1963](#)). During the Renaissance, for instance, Jean Baptiste Colbert, who was once a finance minister in the

court of Louis XIV, formulated a mercantilist theory that emphasized France's self-sufficiency through tax and budget reforms and governmental regulations over commerce and industry. Colbert also gave importance to arts and letters as they, he believed, provided glory and prestige to the French monarchy. The Enlightenment in the eighteenth century benefited from Colbert's ideas. The Society's objective cited above reverberates the period's zeitgeist as expounded by the likes of Colbert. These ideas inspired the economic policies of Spanish officials who governed the colony during this period (Hornedo, 2001; Kurtzleben, 1997). The Sociedad made numerous contributions to the overall economy of the colony. It supported the conduct of regional fairs to stimulate industry and agriculture, conducted research, and promoted advancements in agriculture. It dedicated time and resources to the Meteorological Observatory managed by the Jesuits at Ateneo Municipal. The Sociedad also supported proposals for the construction of railways, ports, and waterways and enriched its library, transforming it into a hub for scientific research. This support included a donation from the Smithsonian Institution in Washington (De Mas, 1877; Legarda, 1999).

The reforms brought about by the establishment of Sociedad Economica de los Amigos del Pais greatly influenced vocational education in the Philippines. As Alzona (1932) opines,

"In writing the history of vocational education in the Philippines, the contribution of the Economic Society of the Friends of the Country must not be ignored."

Influenced by the European trend to promote 'profitable' education, the Sociedad Economica funded activities that eventually advanced vocational and technical education in the Archipelago (Arcilla, 1998). In 1823, the Society initiated the translation, printing, and free distribution of the Lancaster's Guide to Teaching (Fernandez & Moreno, 1875). Joseph Lancaster was a British educator who developed a teaching method in his Royal Free School in London. The distinguishing feature of this method was monitorial instruction (Hager, 1959; Upton, 1996). The latter is described as follows:

In a single and outsized classroom, enormous numbers of students were subdivided into smaller groups, or classes, according to their level of advancement. Under the eye of a monitor, a slightly more advanced student, each class recited its lessons at a semicircular station, or draft, along the side wall of the schoolroom (Upton, 1996).

In 1828, the Sociedad Economica ordered the printing of booklets on drawing elements. Not only had the Sociedad Economica provided materials for vocational and technical education. In 1856, the institution referred young students to Europe to pursue mechanical studies. In addition, Sociedad Economica allocated an amount to establish a museum in 1850. A part of this amount was used to purchase samples of "articles of the country's industry." These samples were sent to represent the colony in the London Universal Exhibition (Expediente de La Sociedad Económica de Filipinas, n.d.; Fernandez & Moreno, 1875).

### **The Escuela Practica Profesional de Artes Y Oficios**

As explained above, the economic transformations and the epistemic impulse from the Enlightenment in the eighteenth century up to the first half of the nineteenth century caused changes in the colony's sensibility about education.

Technical and vocational education through formal trade schools were innovations brought about by the Enlightenment and Industrial Revolution. It was during this period that apprenticeship became obsolete. School-based skill training became the trend (Wollschläger and Guggenheim, 2004). However, it is by no means to say that Europe had a universal technical and vocational education system at the time. As Greinert (2004), professor of vocational pedagogy at the Technical University of Berlin, puts it:

Paradoxically, the process of industrialisation in Europe did not produce one uniform vocational training model. On the contrary, it more or less destroyed the roughly homogeneous craft/trade-based vocational training methods that had established themselves over the centuries and replaced them with a myriad of 'modern' education systems, which at first glance seem to have very little in common. Given their diversity, however, it would be wise to be careful with the term 'education and vocational training system'.

The table below shows the three classical models of vocational education and training according to [Wollschläger and Guggenheim \(2004\)](#).

**Table 1.** *Three Classical Models of Vocational Education and Training*

	<b>The Liberal Market Model Britain</b>	<b>The State-Regulated Model France</b>	<b>The Dual-Corporate Model Germany</b>
<i>Who determines how vocational education and training are organized?</i>	Negotiated 'in the market place' between representatives of labour, management, and providers of vocational education and training.	The State	State-regulated chambers of craft trades, arranged by profession
<i>Where does vocational education and training take place?</i>	There are many options: in schools, in companies, in both schools and companies, via electronic media, and others.	In special schools, so-called 'production schools'	In predetermined alternation between companies and vocational schools ('dual model').
<i>Who determines the content of vocational education and training?</i>	Either the market or the individual companies, depending on what is needed at the moment. The content is not predetermined.	The state (together with the social partners). It does not aim primarily to reflect practice in enterprises, but relies on more general, theoretical training.	Entrepreneurs, unions, and the state jointly decide.
<i>Who pays for vocational education and training?</i>	Generally, those who receive vocational education and training also pay for it. Some companies finance specific courses that they provide.	The state levies a tax on companies and finances vocational education and training, but only for a certain number of applicants each year.	Companies finance training within the enterprise and can offset the cost against tax. Trainees are paid a contractually determined sum. The state funds vocational schools.
<i>What qualifications are gained at the end of vocational education and training, and to what opportunities do these qualifications lead?</i>	There is no monitoring of training or universally accredited final examinations.	There are state certificates, which also entitle the best graduates to go on to higher courses.	The qualifications are generally recognized as entitling their holders to work in the relevant occupation and to go on to higher courses.

Based on this table and succeeding information, one can notice that France greatly influenced Spain in institutionalizing technical and vocational education. The Bourbon, the family that also ruled France for a long time, had implemented innovations in Spanish national and colonial policies ([Barbier, 1977](#); [Gibson, 1966](#)). These innovations sought to provide the "Spanish-American empire a modern state apparatus, extract more revenues from it, and defend it effectively from foreign interlopers" ([Cuello, 1988](#)).

Despite the demoralization, shame, and impoverishment caused to Spain by losing its former colonies in Latin America and economic subordination to Britain, the Empire still wished to experience the prosperity that its European neighbors were reaping from the Industrial Revolution. To do this, Spain endeavored to "catch up with modern science, improve its transportation and communication systems, develop a modern industrial base, and enhance its productivity and that of the colonies it still possessed" ([Constantino, 1975](#) ; [Elena & Ordóñez, 2000 p. 71](#)). Spain recognized the importance and economic utility of modern science. The establishment of different specialized educational institutions highlights this recognition. One of these institutions was the *Escuela Profesional de Artes y Oficios*.

Four schools of arts and trades in the Philippines were established during the last quarter of the 19th century. Two were in Iloilo and Pampanga, and the other were in Malabon and the capital (Fox, 1976; Zaide, 1979). There was a plan to establish trade schools in provinces like Ilocos Sur, Ilocos Norte, Albay, and Cebu. However, this plan did not push through (Alzona, 1932).

Despite the small number of trade schools in Spain compared to its neighbors, the government understood the importance of establishing the likes in the Archipelago. It has to be noted, in addition, that as early as 1883, construction of the said *Escuela de Artes y Oficios* had been started under the sight of the Augustinians (Ministerio de Ultramar, 1883).

Alvarez (1891), a high-ranking engineer from the *Cuerpo de Montes* and the first director of the Escuela, once remarked about the motivation for establishing the Escuela:

*Y si tales Centros de Instruccion son necesarios en Europa y ejercen allí una alta influencia social, son todavia más indispensables aqui, donde el obrero no tiene los medios de adquirir la cultura e ilustracion que en las grandes ciudades de Europa y America y al propio tiempo no encuentra facilidades para hacer su aprendizaje en los oficios y en las artes, por ser escasos los establecimientos industriales y manufactureros que existen en el país.*

*Y era tanto más de lamentar aquí la falta de escuelas de enseñanza teorico-práctica para los obreros y artesanos, cuanto que de todos son bien conocidas las favorables disposiciones y la especial aptitud de estas razas indígenas para las artes y trabajos manuales (Alvarez, 1891, pp. 7-8).*

If such schools are necessary in Europe and exert a high social influence there, they are even more indispensable here, where the worker does not have the means to acquire the culture and knowledge in the great cities of Europe and America, and at the same time does not find facilities for apprenticeship in trades and the arts, because there are few industrial and manufacturing establishments that exist in the country.

It was more regretted here the lack of schools of theoretical-practical education for workers and artisans, as that everyone is well aware of the favorable dispositions and the special aptitude of these indigenous races for arts and crafts.

### The Courses

The *Escuela Practica Profesional de Artes y Oficios de Manila* began operating on 15 October 1890 by the Royal Decree issued on 5 April 1889 (Alvarez, 1891; Fox, 1976). A call for teachers to apply was announced on 3 October 1890. The workshops to be urgently filled in were the following: printing, lithography, engraving, locksmith's trade, smithy, turnery, carpentry, joinery, woodcarving, masonry, and stonework (Alvarez, 1891). The school was housed in a rented building in Intramuros, but two years later, the space proved inadequate to accommodate the increased number of enrollments (Perona, 1892). The government allotted funds to construct a permanent structure for the Escuela. The academic year ran from July to March. (Alzona, 1932; Fox, 1976). Classes were held in the afternoon, while some courses extended into the evening. (Alvarez, 1891; Perona, 1892; Fox, 1976).

Courses were grouped into three categories: *Enseñanzas Orales*, *Enseñanzas Graficas*, and *Practicas de Taller*. The second and third categories emphasized practical training in mechanical drawing, printing, lithography, engraving, smithy, locksmith's trade, carpentry, cabinet making, wood carving, and turnery. The first category was composed of courses or lectures on the following themes (Alvarez, 1891):

- Arithmetic and Geometry with applications to arts, trades, and commerce
- Algebra
- Topography
- Physics and Chemistry with applications to arts and trades
- Mechanics
- Principles of Construction
- Materials Science
- Political Economy



- Mercantile Law
- Commercial Geography and Statistics
- Bookkeeping
- Accounting
- Mercantile correspondence and operations
- French
- English

This curriculum was updated to include courses on trigonometry, stereotomy, construction site hygiene, urban property law, electricity, and industrial motors (Goyena, 1895). The Escuela also enriched its workshops in the succeeding years of its operations. In the school year 1892-1893, the Escuela created a workshop for electricians to spread knowledge about electricity as the latter was poised to dominate Manila (Perona, 1892). These additional courses hint at the transformation of technological education that the Industrial Revolution in Europe brought about. Traditionally, a master in a workshop or guild taught a limited number of individuals the skills and information on making crafts. Imitation was considered the primary method of gaining knowledge. As such, training in a guild under the tutelage of a master craftsman took several years to complete (Lyon, 1920). This list of courses manifested the competent scientific foundation that the Escuela offered its students. The Escuela also allowed its students to choose various career options, demonstrated in the course offerings listed in 1893. Aside from the general courses and apprenticeships, the Escuela offered courses on mechanical engineering and courses for those who wished to become electricians or contractors (Alzona, 1932).

### The Faculty

In the inaugural year of the Escuela, the faculty and staff were composed of professors, teaching assistants, a clerk, and a concierge (Alvarez, 1891). The roster of teaching staff included:

**Table 2.** Faculty Roster of the Escuela Practica Profesional de Artes y Oficios in Manila, 1891-1892

Enseñanzas Orales		
Name of Faculty	Appointment	Course/s handled
<b>Professors</b>		
Julian Romero Alvarez, school director	first-class chief engineer, Cuerpo de Montes	Arithmetic and Geometry with application in the Arts, Trades, and Commerce, Elements of Algebra, Notions of Topography
Ramon Blanco	Accounting and Languages	English
Tomas Torres Perona	professor at the University of Santo Tomas and Dean of the Faculty of Pharmacy	Elements of Physics with application in the Arts and Trades; Elements of Chemistry with application in the Arts and Trades
Francisco Pintado	Commander-Captain, Cuerpo de Ingenieros del Ejercito	Notions of Mechanics, Principles of the Art of Construction, Materials Science
Franciso de Quinto	Accounting and Languages	French
Jose Vicente Velasco	Accounting and Languages	Bookkeeping, Accounting, Mercantile Correspondence, and Operations
Enrique Villamor, school secretary	Commander, Cuerpo de Artilleria	Political Economy, Mercantile Law, Commercial Geography and Statistics
<b>Teaching Assistants</b>		
Emilio de la Guardia	Captain, Cuerpo de Artilleria	Arithmetic and Geometry with application in the Arts, Trades, and Commerce, Elements of Algebra, Notions of Topography
Salvador Navarro	Captain, Cuerpo de Ingenieros del Ejercito	Notions of Mechanics, Principles of the Art of Construction, Materials Science
Domingo Sanchez	Zoological Collector, Inspeccion General de Montes	Elements of Physics with application in the Arts and Trades; Elements of Chemistry with application in the Arts and Trades

Table 2. *continued*

Enseñanzas Graficas		
Name of Faculty	Appointment	Course/s handled
<b>Professors</b>		
Guillermo Cavestany	Commander, Cuerpo de Artilleria	Geometric Industrial Drawing with instruments and freehand, Linear Drawing, and Topographical Drawing.
Federico Valera	Commander-Captain, Cuerpo de Artilleria	Drawing of Ornamentation and Figures with application of color to decoration.
<b>Teaching Assistant</b>		
Felix Martinez	Painter	Drawing of Ornamentation and Figures with application of color to decoration.
Practicas de Taller		
Masters	Workshop	
Guillermo Partier	Printing, Lithography, and Engraving	
Francisco Campa	Blacksmithing and Locksmithing	
Nicario Villareal	Carpentry, Cabinetmaking, and Woodcarving	
Marcelino de Castro	Turnery	

Due to the expansion of the courses and workshops, the number of teachers at the *Escuela* slightly increased in the subsequent school years. This number, however, was too small considering the number of students in a class (Alzona, 1932).

It can be noticed that some of the professors and teaching assistants were military officers at the Corps of Army Engineers and the Corps of Artillery. From this, one can infer the colonial government's trust and reliance on the military and engineers to teach theoretical and practical courses at the *Escuela*.

### Mode of Teaching

The *Escuela* aimed to enhance students' skills through theoretical and practical education. The school was well-equipped in terms of learning materials used. To adequately equip the *Escuela*, the government also allotted funds to establish an industrial museum (Alzona, 1932). Aside from this, the *Escuela* also had a physics cabinet, chemistry laboratory, topographic instruments, maps and stamps, art tools, workshop tools, appliances, and machines, and later established workshops on manual trades. These facilities offered practical experience to students as a supplement to their theoretical studies. This approach aimed to make their knowledge more applicable and prepare them for work in industry and the arts. A pair of a professor and a teaching assistant handled some classes.

The library collected reading materials in Manila related to the subjects taught at the *Escuela*. It expanded and enriched with books from Spain and abroad, focusing on industry, the arts, and applied sciences (Alvarez, 1891).

The school initially focused on *Enseñanzas Orales* and *Enseñanzas Graficas* as workshops were only beginning to be established (Alvarez, 1891). As stated above, practical workshops were integrated into the curriculum alongside the *Enseñanzas Orales*. These changes in teaching demonstrate the *Escuela*'s responsiveness to the needs of society and industry during the last decade of the 19th century (e.g., operations of the telegram and tranvia and the electrification of Manila).

### The Enrollment

The study pattern at the *Escuela* is entirely different from the structured approach used in other schools, then and now. A student could select the courses or workshops he would attend rather than following a fixed and



year-level curriculum (Alvarez, 1891; Perona, 1892; Goyena, 1895). The first awardee of the Premio Extraordinario, Ceferino Cacnio, was an alumnus in arithmetic, geometry, physics, chemistry, linear drawing classes, and smithy and turnery workshops (Perona, 1892). This indicates that students in the *Escuela* had the agency to tailor their education based on their abilities, interests, needs, and career goals.

Graduation or completion depended on passing examinations in chosen courses. In 1891, 929 individuals enrolled in the *Escuela*, and 2,252 enrolled by subject, considering that each student took courses simultaneously. Despite the large number of enrollments, only a few completed the courses. In arithmetic, for instance, 405 individuals enrolled, but only 20 underwent the assessment, and 13 passed. Among 226 examinees from the enumerated courses, 189 passed (Alvarez, 1891). The succeeding year shows the same trend (Perona, 1892). Students who performed well in the courses were also given recognition – either a student obtained premio or accessit.

As Frederick Fox (1976) notes, “there were also sets of course sequences that led to the technician title of perito in the fields of business administration, machinery, and chemistry”. In 1895, for example, eight completers received either *perito mercantil* or *perito mecanico* (Goyena, 1895). Fox (1976) furthers that tuition at the *Escuela* was free except for those sequences leading to the expert titles, which cost one *peseta*.

### **The Escuela's Location and Savings Bank**

The location of *Escuela* was a concern to some, for this limited the number of students who could receive the ‘*ilustracion practica*’ that the school offered. By 1895, oral classes and workshops were conducted in two separate buildings (i.e., *Edificio de Clases Orales* and *Edificio de Talleres*). The second director of the *Escuela*, Don Tomas Torres y Perona, even expressed his hope that establishing such schools in other areas of the Archipelago would be realized soon (Perona, 1892). After all, it was the conviction of these administrators that trade schools could contribute to the colony's well-being.

*El gran trabajo que tienen que realizar en éste país las Escuelas de Artes y Oficios, es precisamente equilibrar la enseñanza, abriendo caminos hasta hoy desconocidos al pueblo y dándole medios de poder ganarse honradamente el sustento. Dichas Escuelas, hoy circunscriptas á las de Manila é Iloilo y la Escuela de Agricultura también recientemente creada, son las llamadas á empezar á luchar en los terrenos pacíficos de la enseñanza y difundiendo sus conocimientos prácticos, hacer que nueva savia se reparta por el Archipiélago, contribuyendo á su bienestar y á su riqueza.*

The great work that the Schools of Arts and Trades have to do in this country is to balance teaching, opening paths hitherto unknown to the people, and giving them the means to earn their livelihood honestly. These schools, which are now found today in Manila and Iloilo, and the recently created School of Agriculture are the calls to start fighting in the peaceful lands of teaching and disseminating their practical knowledge, cause new sap to spread throughout the Archipelago, contributing to their well-being and wealth.

Not only did this school teach the value of science and technology in society, but it also encouraged the “love of work and perseverance” among the youth through an attached banking institution. In 1892, Governor General Eulogio Despujol approved the creation of the *Escuela Practica Profesional de Artes y Oficios* school savings bank in Manila. The objective of this institution is to receive and safeguard the savings of the students enrolled in the *Escuela* and of schools of drawing, painting, sculpture, and engraving in Manila (Reglamento de la Caja de Ahorros Escolar de la Escuela Central de Artes y Oficios, 1892). The banking institution within the *Escuela* reflects another trend of the time, namely, the “School Savings Movement” (Oberholtzer, 1915). School savings banks were used in public schools in Europe. The idea behind this trend, as conceptualized by Belgian historian and jurist Francois Laurent, was to develop “the child's individuality and self-responsibility, causing him to consider the earning value of money, and to understand it as a comfort factor and a power for good” (Oberholtzer, 1915).

The operation of the *Escuela* and, in essence, the entire technical education was halted by the Philippine Revolution ([Philippine School of Arts and Trades, Catalogue 1917-18, 1917](#)). Years later, the Americans would open manual training schools (later trade schools) in almost all provinces that offered students courses on woodwork and metalwork.

## CONCLUSION

Engineering education in the Philippines can only be appreciated with its history. The colonial period provides lessons about how such education was crafted to respond to social challenges.

Spain's typical image has been that of a tyrannical colonizer, and [Agoncillo \(1956\)](#) opines, "no colonial administration could have been better on paper than that of Spain". Despite this, and as this current essay would like to argue, Spain endeavored to offer the colonized *Indios* scientific, technical, and vocational education through the *Escuela Practica Profesional de Artes y Oficios*. The history of *Escuela* offers one a nuanced perspective on Spanish rule in the Archipelago.

French traveler and medical doctor [Mallat \(2012\)](#) made the following remarks on the state of education in the country:

the education of the *Indios* is far from backward, if it is compared to that of the lower classes in Europe; almost all Tagals know how to read and write. However, as for the sciences properly called, they have made very little progress among the *Indios* of the Philippines...

Years after, this backwardness in science would be addressed by Spain through the establishment of the *Escuela Practica Profesional de Artes y Oficios*. Thus, the *Escuela* can be considered a beacon of scientific education in the Archipelago. Economics was the primary motivation for this effort. Spain's then-evolving mercantilist/capitalist sensibility brought about the idea of making education profitable through science and technology.

The type of education such schools provided, which was part of the reforms Spain had implemented in the nineteenth century, established the Empire's attempt to benefit from science and technology by creating an industrial base.

## Funding

This research received no external funding.

## Ethical Approval

Not applicable.

## Competing interest

The author declares no conflicts of interest.

## Data Availability

Data will be made available by the corresponding author on request.

## Declaration of Artificial Intelligence Use

Not applicable.

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#### How to cite this article:

Macawili, R. A. (2025). Advancing Vocational Education in Colonial Philippines: The Sociedad Económica de los Amigos del País and the Establishment of Escuela Profesional de Artes y Oficios.. *Recoletos Multidisciplinary Research Journal* 13(1), 1-12. <https://doi.org/10.32871/rmrj2513.01.01>