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Secondary level schooling, which previously had tended to meet only the needs of those preparing for the professions or for some similarly high station, showed signs of marked change during the nineteenth century. Under mounting pressure from a more and more widely present primary education and from the demands of an increasingly complex economic, political, and social world, enrollment rose and curricula broadened. These changes, it should be noted, did not come all of a sudden like a clap of thunder, but took place gradually and on a relatively small scale. There was about them, moreover, a certain simultaneity of occurrence, each influencing the other.

Curricular innovation began early in the century with the introduction of a program which, while still largely academic, was more general in its interests and less difficult to master than the classical literary studies of the *lycée*, the *gymnasium*, and the grammar school. A new type of learning center called the *collège* in France, the *Oberrealschule* in Germany, and the academy in the United States offered this revised family of courses. Further diversification came during the last half of the century when more natural science entered the preuniversity programs, and a wide range of vocational training establishments appeared in the more advanced countries.

Still, notwithstanding all the progress achieved, there remained even at the end of the century much to be improved everywhere. Curricula continued to be excessively bookish, while the proportion of the young who were actually reached by secondary level instruction in any form stayed pitifully small.[1] Thus, for example,

1. This bookishness in school learning is noted, for instance, by R. L. Archer in science instruction as it was presented in England between 1870 and 1890. He comments: "The London Matriculation Examination had most influence on the schools which were

with respect to participant spread, the performance of the United States is expressive. There, general policy as well as growing wealth favored the extension of schooling. Yet, of its total school enrollment in 1898, just four percent was secondary and one percent postsecondary.[2]

Conspicuous among those missing from the student lists in the world's then active middle-level institutions of learning were the girls. While a fair number of young women did attend those grades called the "upper elementary," and what might be described as "finishing academies," they were not often to be found enrolled in secondary-level programs of serious academic intent. Japan, then the most aggressive nation in the Orient, opened its first girls' high school in 1895. Indeed, the sole notable exception to this prevailing worldwide pattern of sexual imbalance appears to have been the United States. In 1897-98 high school girls in that country outnumbered the boys by a ratio of 56 to 44.[3]

The same causes that promoted the expansion and differentiation of secondary-level instruction elsewhere exerted a similar effect in the Philippines, although naturally with a certain amount of time lag and modification. This influence reached the archipelago, sometimes indirectly through Madrid whose secondary school legislation of 1867, for example, clearly reflected West Europe's current interest in the more practical purposes of education, and sometimes directly through face-to-face contact with individual Americans and West Europeans. From very early in the century Manila carried on extensive trade relations with both England and

most likely to take science; . . . in that examination it was possible to pass in chemistry without entering a laboratory" (*Secondary Education in the Nineteenth Century* [Cambridge: Cambridge University Press, 1921], p. 143).

In a similar vein, the Lynds describe the laboratory facilities offered by a high school in a midwestern United States town in 1894. They quote the school yearbook for 1894: "The laboratory is situated in what is known as the south office, a room 6 x 4 feet. On the east side of the room are a few shelves containing half a dozen bottles of chemicals . . . The physical [sic] laboratory will be found (with the aid of a microscope) in a closet adjoining the south office" (*Middletown* [New York: Harcourt, Brace and Co., 1929], p. 201, n. 1).

2. N. M. Butler, ed., *Education in the United States*, vol. 1 (Albany, New York: J. B. Lyon Company, 1900), p. 82. John Dewey expands somewhat on the limits which these data indicate. He writes (1899): "Hardly one percent of the entire [United States] school population ever attains what we call higher education: only five percent to the grade of our high school; while much more than half leave on or before the completion of the fifth year of the elementary grade" (*School and Society*, rev. ed. [Chicago: University of Chicago Press, 1915], p. 25).

3. Butler, *Education*, p. 200. The teaching staff exhibited a similar pattern of distribution by sex. Here the ratio was 54 to 46 in favor of the women.

the United States.[4] Thus we find that from a handful of secondary-level establishments active in the archipelago in 1860, the number rose in 1895 to approximately 80.[5] A significant number of the additions were vocational training centers of rather considerable size and curricular elaboration.

TRADE, ART, AND TECHNICAL EDUCATION

While the universities provided the three major professions – law, medicine, and the religious ministry – with a varying amount of relevant training from the thirteenth century onward, other kinds of occupational competence depended for their development almost wholly upon apprenticeship programs until well up into the late nineteenth and early twentieth centuries. Only slowly and with great difficulty were centers for the preparation of teachers set in motion. The foundation of trade, art, and technical schools encountered similar obstacles.

With respect to these latter, there was not merely a problem of funding, or of an adequate supply of capable mentors, or simply, of a new way of conducting business or industrial affairs. Socio-economic status, always a matter of concern to the upper classes and a growing one to the emerging urban factory worker, was also at stake.[6] Many of the rich, on the one hand, considered vocational

4. The United States maintained formal commercial representation in Manila from as early as 1825 (U.S. Bureau of the Census, *Census of the Philippines . . . 1903,* vol. 4 [Washington: Government Printing Office, 1905], p. 575). France opened its consulate there in 1836, England in 1847, and Germany prior to 1881. From the 1830s onward to the end of the century, the archipelago's two largest customers appear to have been England and the United States. Sugar and hemp were their principal purchases.

5. This total counts only those institutions which enjoyed more or less formalized accreditation. It does not include, for example, those Escuelas de Latinidad which were not recognized by their legal supervisor, the University of Santo Tomas. Nor does it include those very small proprietary vocational schools of business, language, music, and dancing which operated in Manila and Cebu. The *Anuario Filipino para 1877* (Manila, 1877) lists no fewer than nine of these centers as active in the national capital alone (p. 237).

6. A 1902 enrollment record for higher studies in British India illustrates how the social status attitude can depress interest in the nonprofessional programs:

Type of College	*Enrollment*
Arts	17,651
Law	2,767
Medicine	1,466
Engineering	865
Teaching	190
Agriculture	70

education, as costly, unnecessary, and perhaps a threat to their control-position. The poor, on the other hand, regarded this type of schooling as a vicious device either to prevent their children from climbing into the professions or to box them into permanently subordinate jobs.

In the end, neither the rich nor the poor won the final decision: the machine did. Its firm and unequivocal "yes," however, actually made so gradual an impact that before 1900, trade, art, and technical schools as such occupied little better than a very minor place in the educational system of any country in the world, even the most technologically sophisticated.[7]

The Filipinos, like their contemporaries in the rest of the world, tended to prefer the preuniversity type program for their children at the secondary level. That was the usual road to wealth, power, and social prestige. Nevertheless, they did send a surprisingly large number of them to the vocational training institutions. Nineteen such establishments, not counting the very small proprietary centers that operated in the principal port cities, served the archipelago during the final third of the century.

Four of these concerned themselves with the preparation of teachers. Four were foundations of a type called a school of arts and trades. Four devoted themselves to the improvement of agriculture. And seven offered specialized training respectively in vocal and instrumental music, drawing and painting, horticulture, telegraph operation, office practice for business, military science, and piloting. Of the 15 which composed the nonteacher-training group, three were managed by religious organizations, four by such semiprivate associations as the Chamber of Commerce (Junta de Comercio) and the Royal Economic Society of the Philippines, and eight by public officials. All 15 received funding in whole or in part from the government treasury, and all offered their services free, or practically so. Table 1 lists these schools according to date of foundation, location, and type of administration.

(S. Nurullah and J. P. Naik, *History of Education in India during the British Period* [Bombay: Macmillan and Co., 1943], p. 287).

7. Archer's description (*Secondary Education*, p. 277) of conditions prevailing in England between 1870 and 1880 is informative. He writes: "The more observant English manufacturers and merchants began to realize that our [English] technical instruction was a mere skeleton and that any training which would produce scientific researchers among the highly educated classes was non existent." The subsequent issue of the *Report of the Royal Commission on Technical Instruction* in 1884 and the Technical Instruction Act of 1889 were a major turning point for vocational education in England.

Table 1. Vocational Schools Founded from 1742 to 1893

	Foundation Date	Location	Type of Administration
Colegio de Tiples (Choir School)	1742	Manila	Private
Academia Náutica	1820	Manila	Public
Escuela de Comercio	1839	Manila	Public
Academia de Dibujo y Pintura (Drawing and Painting)	1849	Manila	Public
Escuela Práctica de Botánica	1861*	Manila	Public
Academia Militar	1863*	Manila	Public
Escuela de Telegrafistas	1872	Manila	Public
Escuela Práctica de Agricultura	1872	Tamontaca, Cotabato	Private
Escuela Práctica de Agricultura	1881*	La Carlota, Negros	Public
Escuela Práctica de Agricultura	1881*	S. Pedro Magalang, Pampanga	Public
Escuela de Artes y Oficios	1882	Malabon, Rizal	Private
Escuela de Agricultura	1887*	Manila	Public
Escuela de Artes y Oficios	1889*	Manila	Public
Escuela de Artes y Oficios	1890*	Iloilo	Public
Escuela de Artes y Oficios	1893	Bacolor, Pampanga	Public

*Date of the authorizing legislation.

FOUR OLD SCHOOLS

Four vocational schools, large and prominent enough to secure a place in the annual government directory, the *Guía oficial de las Islas Filipinas,* served the archipelago prior to 1860. While one of these, the Escuela de Comercio, gave way about 1890 to institutions that had introduced more elaborate programs in the same field, the other three remained active until the end of the Spanish era.

Thus, just as during the previous decades, going back even to 1742, the Manila Archdiocesan Choir School (Colegio de Tiples)

continued now to keep in residence and to teach a group of boys aged 6 to 14 for some seven years each.[8] Enrollment ranged from 14 to 28, with the staff usually numbering about four.[9]

The school aimed primarily at preparing proficient singers and musical instrument performers for the solemn liturgical ceremonies of the cathedral in the national capital. It did not, however, limit itself to this one purpose. Staff members taught courses in both the boys' and the girls' *colegios* of the city, and privately tutored individual pupils of all ages.[10]

The program proper provided each youngster with a standard primary school education in letters and numbers, along with as much technical training in the theory and production of music as his individual talent, interest, and industry permitted. A list of courses which appear in the *Guía: 1894* indicate the form which the professional instruction took. These were: musical composition, vocalization, performance techniques with the organ, piano, and stringed instruments.[11]

The biweekly, *la Ilustración Filipina,* carried a feature article concerning the Colegio de Tiples on 8 August 1893. With respect to its alumni, the author named four persons as being among the most prominent. They were Antonio García, Maximo Nazario, Bibiano Morales, and Simplicio Solís. The first two were pianists, and the last two violinists and composers. Three others worthy of note are Jose Canseco (1839-1902), an able singer and composer; Florencio Lerma (1861-97), musical director of a zarzuela company and teacher of music at the Colegio de Santa Isabel in Naga; and Natalio Mata (1833-96), choirmaster and organist for the Quiapo church.[12]

8. In 1877 the school had quarters at No. 15 Legaspi Street in the Walled City.

9. The *Guía: 1881* (p. 130) reports an enrollment of 28; the *Guía: 1892* (p. 477). 14; and the *Guía: 1894* (p. 326), 18.

One member of the school staff was eminent enough to have an article to himself in the "Espasa" (the *Enciclopedia Universal Ilustrada*), the best of the Spanish general encyclopedias. This was Oscar Camps y Soler who studied music in Italy under the masters, Theodore Böhler and Guiseppe Mercadante. In Madrid, prior to his coming to the Philippines, he taught music, and wrote about it in books and scholarly journals.

10. The *Guía: 1885* (pp. 570–71) reports that the Ateneo Municipal, for instance, employed four instructors in singing and six in piano. Among these were two members of the Choir School staff, Oscar Camps and Blas Echegoyen; and two of its most distinguished alumni, Simplicio Solís and Antonio García.

11. *Guía: 1894*, pp. 326 ff.

12. Volume 3 of the *Encyclopedia of the Philippines* (Manila: Philippine Education Co., 1950) contains some basic biographical information about Solís. The other three persons are listed in the *Dictionary of Philippine Biography* (Quezon City: Filipiniana Publications, 1955); henceforth cited as *DPB*.

Like the nearby Colegio de Tiples in music, the Academia Náutica kept on right through to the close of the century, attentive to its work of preparing officers for merchant ships.[13] Few tasks were indeed more important for the material welfare of an archipelago. Located first in the Consulado Building on Cabildo Street, it transferred in 1863 to Letrán Street. From there it moved again in 1884 to Palacio Street.[14] All of these sites lay within the walls of old Manila which looked out directly west on the China Sea.

The program of training which the school offered between 1860 and 1898 had two parts. First came a four-year sequence in classroom instruction composed principally of courses in cartography, hydrography, mathematics, topography, and astronomy. Upon the successful completion of these studies, there followed an internship of practical experience on vessels making regularly scheduled voyages.[15]

A staff of seven usually sufficed for both the teaching and the general management needs of the school. The first director was Gabino Ciscar, squadron commander of the Royal Navy. Next came Jose Vico, a pilot, first class, with the rank of *Teniente de Fragata de la Armada.* Their two successors between 1860 and 1898 were Alberto García and Antonio León Rocha, both of whom appear to have performed their administrative as well as teaching roles with exceptional competence.

Unfortunately, many of the students found the mathematics courses excessively difficult, with the result, observed the *Archipiélago Filipino,* that dropouts were numerous. The average enrollment for the last half of the century, according to the same publication, hovered between 50 and 60.[16] Of those who did succeed in winning a certificate, perhaps the two most distinguished were Rocha himself who, besides acting as head of the school for many years, developed and directed an extensive domestic shipping

13. It will be recalled that this school was established in 1820 by the Junta de Comercio, primarily as a support for interisland shipping, then the country's chief means for the distribution of goods. The program underwent revision in 1837 (see the *Nuevo Reglamento para la academia de pilotage de Manila* [Manila, 1837], p. 13). Sinibaldo de Mas claims that the student register came to 50 in 1842 (*Informe sobre el estado de las Islas Filipinas en 1842,* vol. 2 [Madrid, 1843], pp. 6–7).

14. *Prospectus, Philippine Nautical School: 1904–1905* (Manila: Bur. of Ed., 1904), p. 1. This institution is the direct descendant of the Academia Nautica of Spanish times.

15. *Guía: 1881,* pp. 339–40.

16. *Archipiélago Filipino,* vol. 1 (Washington: Government Printing Office, 1900), p. 349.

empire.[17] The other was Pascual Ledesma, a native of Negros who, after securing his diploma in1863, became a pilot, a landowner in Mindoro, and finally Secretary of the Navy in the Malolos cabinet.[18]

The Escuela de Comercio, inaugurated in 1840 by the Junta de Comercio to assist local businessmen conduct their international trade affairs with maximum efficiency, remained active in pursuit of that purpose until about 1890. In that year, its very modest set of four courses gave way to a more comprehensive and systematic program of instruction in the same field provided by the newly opened Manila School of Arts and Trades.[19] During its 50 years of operation it had met a real need by offering free and at convenient evening hours, immediately useful training in bookkeeping and commercial arithmetic, English, and French.[20] Table 2 gives an idea of enrollment figures at the school.

More conspicuously successful than any of the old vocational schools was the Academia de Dibujo y Pintura (Academy of Drawing and Painting) which, it will be recalled, opened 27 March 1850 in the Walled City. Indeed, some writers have called the final two or three decades of the nineteenth century the golden age of Philippine painting. They were, of course, thinking primarily of Juan Luna and Felix Resurrección Hidalgo.[21] But they also had in mind those lesser, but very capable artists – Isabelo Tampingco, Telés-

17. *La Ilustración Filipina* (vol. 4, no. 113) carried an article about him on the occasion of his death, 12 January 1894.

18. Sol Gwekoh, *Manila Times*, 20 May 1966.

19. This institution opened 15 October 1890. Among its offerings was a *perito* program in business administration (*La Ilustracion Filipina*, vol. 4, no. 1). Full-time day students found a similar program at both the Ateneo and Santo Tomas from 1870 onward. The development of the Philippine economy between 1840 and 1890 was requiring of its operators an increasingly high level of preparation.

A comparable situation was facing the United States. An address to the Federation of Business Teachers Association in 1897 said: "The training which the American commercial college gives its pupils, while good in a way, is extremely narrow and little more than rudimentary. It cannot properly be called business training, it is merely clerical training. While this kind of training may have satisfied the requirements of the past, and while there may continue to be a certain demand for it in the future, I believe the time has arrived when the American commercial school should cease to be a merely clerk factory and educational repair shop, and should assume the duties and position of a real business training school" (Butler, *Education in the United States*, p. 663).

20. *Guía: 1861*, p. 105; Jose Montero y Vidal, *Historia general de Filipinas*, vol. 3 (Madrid, 1895), p. 30.

21. The serious and talented among the students were urged to finish their training abroad in Madrid, Rome, or Paris. Philippine government scholarships were available for this purpose, apparently with a certain amount of regularity. Both Luna and Resurrección Hidalgo received such grants. So also did Sucgang, Zaragoza, Figueroa, Francisco,

Table 2. Enrollment at the Escuela de Comercio for Various Years, 1866–1882

Year	Bookkeeping Commercial Arithmetic	English
1866	24	no data
1870	20	no data
1875	15	20
1880	36	25
1882	116	no data

SOURCE: U.S. Bureau of the Census, *Census of the Philippines* . . . 1903, vol. 3 (Washington: Government Printing Office, 1905), p. 614. (Enrollment figures for French are not included.)

foro Sucgang, Estéban Villanueva, Regino García, Miguel Zaragoza, Melecio Figueroa, and Vicente Francisco, all of whom experienced the expert guidance and inspiring encouragement of Agustín Saez, Lorenzo Rocha, and Lorenzo Guerrero at the academy between 1860 and 1898.[22] The great Saez headed the school from 1862 to 1891, when Rocha and Guerrero, long his associates, succeeded him as director and vice-director, respectively.[23]

The initial 1850 program of four courses grew to six in 1887, and to about double that number in 1893.[24] The 1887 curriculum was divided into two sets of three courses each.[25]

Villanueva, and Rocha. Assertions to this effect found in such biographical sources as the *Dictionary of Philippine Biography* can sometimes be confirmed by an examination of the government budgets. *Presupuesto provincial: 1884–1885,* for example, allots under cap. 2 (p. 74) 1000 pesos to support Juan Luna in Rome. The *Guía: 1885* (pp. 515–17) supplies some further data on the subject.

22. Fabián de la Rosa and Rafael Enríquez also studied with the academy's staff, but their principal work came later. Enríquez was the first director of the School of Fine Arts at the University of the Philippines.

23. A letter from Resurrección Hidalgo to Rizal, dated 15 October 1879, declares that the "training given by Saez was equal to that found in Madrid" (*DPB,* p. 374).

24. While instruction at the school seems actually to have stressed the fine arts, the original charter implicitly called also for attention to the needs of the artisan and the engineer. The aim of the school, according to the *Guía: 1885* (pp. 514–15), was "to spread among all social classes the knowledge and skill of painting and drawing so useful and relevant to all careers." The reader will notice that a number of the artists named in the previous paragraph later appear as staff members of the Manila and Iloilo schools of arts and trades.

25. *Exposición general de las Islas Filipinas* (Madrid, 1887), pp. 92–93.

1. *The Introductory Group*
   Figure drawing
   Decorative drawing
   Line and topographical drawing

2. *The Intermediate Group*
   Anatomy and original drawing
   Oil mixtures, picture composition, and picture copying
   Painting of clothing from various historical eras

When, in the extensive Philippine government reorganization ordered by the Maura Law of 1893, the academy received the rank of an *escuela superior,* this program underwent a number of important changes. The revision reduced drawing to the position of a foundation skill and elevated the level of the painting instruction so that it included such specializations as portraits and landscapes. At the same time, it added wholly new sequences in engraving and sculpture.[26]

Since the academy charged no tuition fee, and as far as is known, awarded no diploma, at least in the earlier decades, student participation seems best measured in terms of course registration. Table 3 indicates that these annual totals were considerable.

Table 3. Registrations at the Academy of Drawing and Painting: Representative years, 1850–1886

Year	Course Registrations
1850	70[a]
1860	160[b]
1880–81	548[c]
1886	574[d]

SOURCE: [a]*Guía: 1885,* pp. 514–15. [b]*Guía: 1861,* p. 105. [c]*Guía: 1881,* pp. 340–41. [d]*Exposición general de las islas Filipinas* (Madrid, 1887), pp. 92–93.

26. *Archipiélago Filipino,* vol. 1, p. 349.

NEW FOUNDATIONS

We turn now to those vocational training centers which emerged in the archipelago subsequent to 1860. Among these the first to be inaugurated was the Escuela Practica de Botanica. This very small plant-care school operated jointly with the Botanical Gardens of Manila from about 1863 onward.[27] Its principal promoter and overall manager was the Royal Economic Society of the Philippines.[28] Funding for the school, although aided by the society, came from the public treasury. The authorizing legislation of 29 May 1861 prescribed a work-study program for 10 students at a time, the instruction to be provided by the director of the gardens and his two trained horticulturists.

While no comprehensive account of the school's operation has as yet come to light, there are data which indicate that it was active between 1863 and 1896. Testimony expressed in the *Dictionary of Philippine Biography*, for instance, declares that Zoilo Espejo presided over this joint project from 1866 to 1869. Espejo is known to have authored a primary school textbook in agriculture.[29] Additional details about the school appear in both the *Guías* and the government budgets from as early as 1863-64 on to 1895.[30] This latter source regularly shows allotments (pitifully small, of course) for student subsidies as well as for the salaries of the director and his two trained gardeners.[31]

Considerable haze surrounds the career of the school called the Academia de Cadetes. Long gaps of silence intervene between a

27. The Manila Botanical Gardens (*Vivero Municipal*) were located in what was then called the Campo de los Arroceros at the west end of the Puente Colgante (site of the present Quezon Bridge) between Sebastian Vidal (P. Burgos) and Arroceros streets.

28. *Guía: 1885*, pp. 548–49. Further information concerning the activities of the society may be found (pp. 172–78) in the *Manual del Viajero en Filipinas* (Manila, 1875) compiled by Ramón González and Federico Moreno. Apropos here was the society's resolution of 31 October 1865 to contribute a monthly sum for the support of the Botanical Gardens School.

29. Espejo's book of 103 pages, *Cartilla de agricultura filipina*, was published in Manila in 1869 by Ramírez y Giraudier. A second edition appeared in 1870. Copies of both may be examined in the Philippine National Library.

30. *Guía: 1885*, pp. 548–49; *Guía: 1889*, p. 353; *Anuario Filipino para 1877*, p. 296; Montero y Vidal, *Historia general*, vol. 3, pp. 317–18.

31. Since the responsibility for the financial support of the school belonged jointly to the national and the local governments, one must consult both sets of budgets for a complete picture: see the *Presupuesto general: 1863–1864* (p. 11), sec. 6, caps. 1 and 2; *Presupuesto general: 1867–1868* (p. 19), sec. 8, caps. 1 and 2; *Presupuesto provincial: 1870–71*, cap. 30, arts. 1 and 2; *Presupuesto municipal: 1878–1879*, cap. 9, art. 1; *Presupuesto municipal: 1885–1886* (Ayuntamiento de Manila), cap. 6, art. 2.

few pieces of unequivocal testimony. Thus, for example, though the date of its legal foundation is 25 November 1863, the earliest witness to its actual operation which this author has been able to find, is a document of 1877. The *Anuario Filipino* of that year contains a succinct but specific description of the school without any indication that it was something recent. The school, said the *Anuario*, has quarters in the courtyard section of Fort Santiago and offers a three-year secondary-level program which prepares Philippine candidates for the National Military Academy at Toledo in Spain. According to the same publication, the instructional staff then (1877) numbered five, the director being Colonel José de Rato and the chief of studies, Commandant Luis Rivera.[32]

Later evidence corroborates the general accuracy of the *Anuario* picture. For one thing, the biographies of two prominent Filipinos explicitly state that these men attended this establishment.[33] Not less affirmative, though spare in the details which they supply, are the declarations concerning the school made by the *Guías* for 1895, 1897, and 1898, as well as by the report of the First Philippine Commission.[34]

The first telegraph line to be installed in the Philippines, that ran between Manila and the naval base at Cavite, opened on 1 December 1872. By the end of the century, a network of 64 stations and 2,600 kilometers of wire covered the islands of Luzon and Panay. To prepare a proficient operator for each of these stations, a very modest-sized instructional center called the Escuela de Telegrafistas was established early in Manila within the telegraphic service itself. It was, therefore, not a school in the usual sense, but a program for training prospective employees.

This organized set of learning experiences provided teaching and practice in that knowledge and in those skills which the on-site role of the station agent demanded. As of 1880, this role

32. *Anuario Filipino para 1877*, pp. 273–75.

33. See the articles in the *DPB* and in the *Encyclopedia of the Philippines* (vol. 3, p. 480).

34. *Guia: 1895*, p. 425; *Guía: 1897*, p. 42; *Guía: 1898*, p. 311; U.S. Philippine Commission, 1899–1900, *Report of the Philippine Commission to the President*, vol. 1 (Washington: Government Printing Office, 1900), pp. 40 and 128. That the school was alive and well in 1894 appears from an announcement carried by the daily newspaper, *El Eco de Panay* on 28 April 1894. This notice stated that competitions would be held on 4 June at the Academia Militar in Manila for student places for the following year. There were 21 places vacant in the infantry section, 2 in the cavalry, 3 in the artillery, 1 among the engineers, and 1 in the military administration section.

was judged to need an ability (1) to read, write, and speak Spanish; (2) to read and write English; (3) to use the station apparatus properly and to maintain it; and (4) to apply limited knowledge of geometry, physics, and chemistry to the simpler technical problems of the day's work. In that year, the director of the center, Ricardo Regidor, had 14 students in the program.[35]

FOUR SCHOOLS OF ARTS AND TRADES

Between 1882 and 1894, four schools designed to prepare students for direct entrance into the trades and the useful arts opened in the archipelago. Two of these were situated in the provinces – one in Panay and the other in Pampanga – and two in the environs of the national capital. Three had public officials for their overall administration, one was managed by a religious order. Two enjoyed enrollments that approached a thousand. While each of the schools had its own occupational stress, the skills that most commonly received attention were carpentry, ceramics, printing, masonry, electricity, and forging.

Of the four, the first to begin was the Malabon School of Arts and Trades. This institution, which originated as an orphanage conducted by the Augustinian Order for boys left destitute by the Manila cholera epidemic of 1882, had its early home on the ground floor of the order's monastery at Guadalupe in Makati. Here, besides food, clothing, and shelter, the youngsters received regular primary school instruction along with a certain amount of suitable trade education.[36]

In 1886 the orphanage staff put forward a major effort to develop the vocational training phase of its activities. They proposed to broaden the program, elevate its technical quality, and open it to all who might wish to profit from its services regardless of whether they were residents of the orphanage or not. Their plan likewise called for a new and larger plant as well as an increased subsidy for operating and equipment expenses.[37] The whole under-

35. *Guía: 1881,* p. 342. Somewhat later, the *Presupuesto provincial: 1884–1885* (Gastos) (p. 70) alloted money to the school under cap. 9 (communicaciones).

36. Valentin Marín y Morales, *Ensayo de una síntesis de los trabajos realizados por las corporaciones religiosas españolas de Filipinas,* vol. 2 (Manila: Imprenta de Santo Tomas, 1901), p. 59. The principal occupational training at Guadalupe seems to have been in printing and bookbinding. The official *Presupuesto Municipal* for 1890 was printed and bound there.

37. There is a fat bundle of documents treating of this project at the Archivo Historico

taking was thought of as the joint responsibility of the Augustinian Order and the Philippine government.

Madrid endorsed the plan with a *Real Decreto* of 21 January 1887.[38] This document describes a curriculum of two levels. The lower of these included training in carpentry, tailoring, printing, iron working, carriage making, and locksmithing. Upper echelon work, with courses such as drawing, appears to have aimed at preparing architects and commercial artists in a preliminary kind of way. Subsequently, we find the *Presupuesto general: 1888* awarding the school 11,083 pesos for equipment and supplies.[39]

The next advance came in 1892 when the projected new building was actually completed at Tambobong (Malabon) and the transfer from Guadalupe carried out. There, despite the financial support which continued to be small throughout the decade, and despite the unrest which gripped the area during the war years (1896-99), the program grew from one of three skills in 1892 to one of about ten in 1898.[40] Enrollment, meanwhile, although remaining substantial, declined slightly from 91 in 1890 to 74 in 1897.[41]

Offering a much wider variety of immediately usable job-training sequences than the older Malabon establishment was the Manila School of Arts and Trades (*Escuela Práctica Profesional de Artes y Oficios de Manila).* This institution which enjoyed the further advantages of both a central location and the personal backing of the then governor-general, Valeriano Weyler, began operating in the national capital on 15 October 1890.[42] Its organizer and first director was Julián Romero Alvarez, a high-ranking engineer from the Department of Natural Resources (*Cuerpo de Montes*).[43]

Nacional (AHN) in Madrid (Islas Filipinas: Fomento, legajo no. 1475). The orphanage staff, for example, wanted a building that would cost 180,000 pesos and equipment that would cost 66,000 pesos.

38. *Gaceta de Madrid,* 23 January 1887.

39. *Presupuesto general: 1888* (p. 28) sec. 8, cap. 2, art. 7.

40. *Guía: 1898,* p. 281. At this time the staff numbered 17, including a director and assistant director, 2 supervisors, 2 classroom teachers, 11 shop teachers and assistant shop teachers.

41. *Guía: 1891,* p. 64; *Guía: 1898,* p. 281. Marín (*Ensayo,* vol. 2, p. 59) affirms that the total population of the school, including the staff, the students, and the workmen, came to 145 in 1898.

42. *Guía: 1898,* pp. 344–49. A *Real Decreto* of 5 April 1899 provided the legal authorization for the school.

43. *La Ilustración Filipina,* 7 January 1893, p. 6. This rather full and informative article notes, among other things, that the most popular of the sequences were those

Systematic instruction and supervised practice was provided in three principal kinds of knowledge and skill. There were courses, for example, in such useful arts as drawing, engraving, wood carving, and mould making in plaster for metal casting. In addition, there were courses in the crafts of tailoring, carpentry, printing, ceramics, iron work, and masonry. Finally, there were set course sequences that led to the technician title of *perito* in the fields of business administration, machinery, and chemistry. This work was carried on partially in eight shops located on Vidal Street adjacent to the Botanical Gardens, and partially in a building at 8 Palacio Street in the Walled City. Except for the sequences leading to the title of *Maestro de Obras* and *Perito Mercantil,* where each course cost one peseta, tuition at the school was free. The academic year ran from July to March. Most of the course groups met in one-hour sessions during the afternoon and evening.[44]

Enrollment at the Manila School of Arts and Trades was large from the outset. The very first year showed a student body of 768 (table 4 gives some idea about the number of students enrolled in the different courses).[45] By 1895-96 that total had risen to 899.[46] Over the same five-year span and somewhat beyond, the staff grew from 15 to 30.[47] Prominent among the professors who served the school at this midpoint in the decade were the two artists Isabelo Tampingco who taught wood carving, and Felix Martínez who directed the course in modeling, moulding, and metal casting.[48] Of the alumni from this same early era, perhaps the most distinguished were Críspulo Zamora, the silversmith, and Arcadio Arellano, the architect.[49]

One year after the inauguration of the Manila School of Arts and Trades, another institution with the same purpose commenced

leading to the titles of *Maestro de Obras, Maquinista, Sobrestante de Obra, Capataz de Minas.*

44. *Guía: 1898,* pp. 344–49; pp. 741–43. For the daily class time schedule, see the *Memoria leída por el Director de la Escuela Práctica Profesional de Artes y Oficios de Manila Illo. Sr. D. Julian Romero Alvarez en la solemne inauguración del curso 1891–1892* (Manila, 1891), p. 29.

45. See note 43 above.

46. *Archipiélago Filipino,* vol. 1, pp. 348–49.

47. *Memoria leída por el Director,* pp. 11 and 12. Thirty is the number recorded for the staff of 1897 (*Guía: 1898,* pp. 741–43).

48. *Guía: 1897,* p. 499. Both of these men seem also to have been associated with the *Escuela Superior de Pintura, Escultura, y Grabado* which was created in 1893 out of the old *Academia de Dibujo y Pintura* (*Archipiélago Filipino,* vol. 1, p. 349).

49. See the brief biographies in the *DPB.*

Table 4. Sample Course Registrations at the Manila School of Arts and Trades for the Academic year 1890–1891

Title of Course	Number of Registrants
Arithmetic	405
Geometry	263
Topography	105
Elementary Physics	124
Elementary Chemistry	98
History of Nature	96
Mechanics	95
Construction Materials	45
Principles of Construction	59
Political Economy	25
Commercial Law	18
Bookkeeping	229
French	80
English	114
Others (seven courses)	496
TOTAL	2252

SOURCE: *Memoria leída por el Director de la Escuela Práctica Profesional de Artes y Oficios de Manila Illo. Sr. D. Julián Romero Alvarez en la solemne inauguración del curso 1891–1892* (Manila, 1891), pp. 30 ff.

operation in the southern port-city of Iloilo.[50] This provincial establishment was modeled directly upon that very educational organization in the national capital which has just been described. Its founder and first director even shared the same surname as his counterpart up north. He was Lorenzo Romero y Pérez, an agricultural engineer.[51]

Although Iloilo was settled about 1585, that is, only a brief two decades or so after the foundation of Cebu, it never really chal-

50. *Archipiélago Filipino*, vol. 1, p. 348. The *Presupuesto general: 1891* (p. 231; cap. 1, art. 2) carries an allotment of 13,800 pesos for a staff of 32, of whom 24 were instructors.

51. *Memoria leída por el profesor J. G. Bosque de la Escuela Práctica Profesional de Artes y Oficios de Iloilo en la solemne inauguración del curso 1895–1896* (Iloilo, 1895); *Guía: 1897*, p. 750.

lenged the position of that city as the country's second most important government and commercial center until the last half of the nineteenth century. During that five-decade period it attracted an unusually large number of mestizos, Chinese, and Europeans who then along with the local inhabitants devoted themselves with exceptional vigor and intelligence to the home-loom manufacture of silk, hemp, and piña fabrics, to cattle ranching, and to the production of sugar, hemp, and rice. At the same time, its port, principally as the result of the sugar boom in Negros, the island directly across the straits to the east, came by 1890 to handle a volume of international marine shipping which was second only to that of the national capital. Indeed, so alive and prosperous was Iloilo during the last decade of the century that it brought in the telephone in 1894, electricity in 1895, and an international cable in 1897.[52]

Like its twin in Manila, the Iloilo School of Arts and Trades conducted a program that had three thrusts, one toward the crafts, one toward the useful arts, and one toward technician type work. Craft instruction included courses in printing, engraving, carpentry, locksmithing, and iron work. Art teaching covered a variety of drawing skills along with modeling in wax and clay, moulding, and metal casting. The technician sequences, at least during the initial years, appear to have been limited to two, namely machinery and business management. Regular instruction extended each year from July to March. No charge was made for tuition.[53]

Enrollment at the Iloilo School of Arts and Trades grew rapidly. In 1894-95 there were 317 students registered for 700 courses. By 1895-96 these figures had risen to 884 and 1490 respectively (table 5 gives sample registrations).[54] The teaching staff numbered 16 at this midpoint in the decade.[55] Active on the staff during this

52. *Archipiélago Filipino, passim,* but especially vol. 1, p. 102 ff., pp. 304 ff., and pp. 321 ff. The province of Iloilo which, according to the *Censo oficial: 1887,* supported 423,462 persons was then the most densely populated district in the Philippines after Manila. Sir John Bowring, who visited Panay about 1860, made numerous complimentary comments concerning the healthy state of its economy (*A Visit to the Philippines* [London, 1859] pp. 344 ff. and 396 ff.). Pius IX made Jaro a bishopric in 1865. Mrs. Campbell Dauncey found Iloilo in 1904 to be "a big town with long straggling streets . . . the houses all two stories high with gray corrugated iron roofs" and surrounded by "little bits of garden" (*Englishwoman in the Philippines* [London, 1906], p. 17).

53. *Archipiélago Filipino,* vol. 1, p. 348; see also the *Memoria por el profesor J. G. Bosque,* pp. 3, 14, and 46.

54. *Memoria por el profesor J. G. Bosque,* pp. 4 and 46.

55. Ibid., p. 14.

period were two well-known Philippine artists, both of whom had taken their advanced professional training in Europe. These were Telesforo Sucgang and Jose Asunción.[56] It was this school which

Table 5. Sample Course Registrations at the Iloilo School of Arts and Trades, 1895 to 1896

Title of Course	Number of Registrants
Geography	80
Arithmetic and Algebra	129
Geometry	75
Physics and Chemistry	12
Elementary Mechanics	10
Applied Mechanics	8
Topography	23
Bookkeeping	20
Construction Supervision	4
French II	35
English II	43
Carpentry	55
Masonry and Stonework	22
Printing, Engraving, and Lithography	88
Locksmithing	7
Lathework	59
Modeling and Moulding for Metal Casting	163
Line Drawing	85
Figure Drawing	275
Decorative Drawing	100
Others	217
TOTAL	1490

SOURCE: *Memoria leída por el profesor J. G. Bosque de la Escuela Práctica Profesional de Artes y Oficios de Iloilo en la solemne inauguración del curso de 1895–1896* (Iloilo, 1895) pp. 46 ff.

56. See the brief biographies in the *DPB*. According to these accounts Sucgang was a Visayan, having been born in Banga, Capiz in 1855. Along with academic courses at the Colegio de San Jose and Letran, he took instruction in art from both Saez and Rocha. Rizal was a classmate of his in the sculpture sequence. Assisted by a Spanish government art scholarship he remained in Europe four years. Asuncion (1869–1925), on the other

introduced electricity to Iloilo City on 1 June 1895. Its Brown-type generator produced 12,000 watts at 110 volts.[57]

The fourth institution of the arts and trades type which served the archipelago during the late nineteenth century made its appearance at Bacolor in Pampanga in March 1893. Bacolor was at that time the chief political town of Pampanga, which was then, as now, a rich rice- and sugar-producing province. It possessed, furthermore, a strategic commercial position just off the principal highway that ran between the national capital and the important Lingayen and Ilocano regions in the northwest.

The major promoter of the project was the then governor, Joaquín Oliver. This gentleman, using public funds along with certain private gifts contributed by interested families in the area, first leased a rather sizeable two-story stone building in the town. Then, having had the interior of this structure remodelled into suitable shop, office, and classroom space, he had the whole fitted out with the best obtainable equipment. When everything was finally ready, the inaugural was celebrated with much pomp. The national biweekly *La Ilustracion Filipina* judged the event to be sufficiently important to carry an account of it in its issue of 21 March.[58]

FOUR SCHOOLS OF AGRICULTURE

Scientific farming has been slow in growing into actual practice, even today, in the greater part of the world. Where it did show progress, the principal means used at first were fairs, farmers' associations, and a certain few specialized periodicals. Only about 1850 did schools of agriculture begin to appear in the more technically advanced nations as an instrument for fostering this kind of development. Indeed, it was not until 1862 that the United States made its first substantive move in that direction. That year, the Morrill Act authorized the foundation of a "college devoted to the teaching of agriculture and the mechanical arts" in each state. This

hand, had an A.B. from the Ateneo before he left for Europe on an art-study grant from Agustina Medel, the owner of the Teatro Zorrilla.

57. U.S. Philippine Commission, 1899–1900, *Report of the Philippine Commission to the President*, vol. 4 (Washington: Government Printing Office, 1901), p. 36.

58. *La Ilustración Filipina*, 21 March 1893. One of the comments made by the writer of this article was that "shops [of the Bacolor school] are superior to those in the national capital."

step was followed by the Hatch Act of 1887 which provided for the establishment of a similarly extensive set of agricultural experiment stations, each of which was to coordinate its work with both its own land-grant college and the national Department of Agriculture. Important in the entire arrangement was the hope that both the research facility and the school would be as helpful directly to the farmers of the state as to the formally enrolled students.

The earliest recognizable Philippine manifestation of the above-noted movement was the Escuela Práctica de Botanica, which a previous section has already described. The second occurred in the shape of the Tamontaca Farm School, which the Jesuits instituted near Cotabato City in Mindanao in 1872. Characteristic of an establishment of this last named type is that the students exchange their work in actual field and livestock care for tuition and keep. Tamontaca, while adopting this general pattern of operation, offered its students a far more total involvement. It was nothing more nor less than an attempt to establish a permanent and largely self-sufficient Christian community in the heart of the Muslim Magindanao region.

Having secured a land grant of ample dimensions from the national government of the Philippines, the Jesuits began in 1872 to gather there Magindanao children who had either been given to them by their parents or whom they had ransomed. These youngsters they supported, and as they grew they were taught how to read, write, and number, as well as how to perform efficiently and effectively all of the activities that farm life included. A group of nuns, Religious of the Virgin Mary, had charge of the girls, while the Jesuits supervised the boys. When the young ones reached maturity, they could elect either to leave or to stay in the community and marry. Those who remained, received a parcel of land along with help toward the erection of a house and the procurement of farm equipment.[59]

This bold enterprise continued active from its inception in 1872 until the American take-over of the archipelago at the end of the century. Growth during this period, although limited because of

59. *Archipiélago Filipino*, vol. 1, p. 365. This venture reminds one of the celebrated "reductions" which flourished in Paraguay in the eighteenth century (see R. B. Cunninghame Graham, *A Vanished Arcadia* [New York: Macmillan, 1901] and more recently, Philip Caraman, *The Lost Paradise* [London: Sidgwick and Jackson, 1975]).

the unfriendly environment, turned out to be considerable. The average enrollment for the later years came to about 140, of whom roughly 75 were boys, and 65, girls.[60]

The next major effort to introduce systematic improvement into Philippine agriculture occurred in 1880. That year, the Province of Negros, which was then carrying out a spectacular expansion of its sugar production, commenced the construction of a model farm at La Carlota, a short distance south of Bacolod. This very carefully planned hacienda laid out its fields and designed its buildings according to the recommendations of experts. It possessed, declares Marco in his history of Negros, water to drive its machinery, instruments to measure and forecast weather, and staff quarters that were both attractive and functional. An engineer by the name of Jose Sánchez y Figueroa took charge as its first director when construction reached completion in 1881.[61]

Even more significant for the archipelago's overall and long-term agricultural progress than this model plantation in Negros was the legislation approved on 15 November 1881. A Royal Order of this date authorized the creation of a Farm Bureau (Servicio agronómico) within the Department of Development (Fomento) in Manila.[62] Among the duties assigned to this new agency were (1) collect a library of books and periodicals with agriculture as their subject; (2) set up agricultural experimentation stations; (3) provide instruction concerning both the theory and practice of scientific farming; and (4) publish and distribute agricultural information.[63]

Subsequent events show that the Farm Bureau took its obligations seriously. By 1885, despite slender resources, it had put into operation a second model farm. This was a hacienda located at San Pedro, Magalang in Pampanga which specialized in horse breeding. Then came the inauguration of the national School of

60. *Archipiélago Filipino,* vol. 1, p. 365. The *Guía: 1885* (p. 169) puts the enrollment at 114.

61. Jose Marco, *Reseña histórica de la Isla de Negros* (Manila: Imprenta Tip. de "la Vanguardia," 1912), p. 104. The Archivo Histórico Nacional in Madrid has a detailed inventory of the farm's equipment as of 1 July 1885 (Filipinas: Fomento, leg no. 476). Another source of information concerning Negros is the earlier book, *Apuntes de la Isla de Negros* by Robustiano Echauz (Manila, 1894). The revolution of 1896–98 inflicted grievous damage on the farm.

62. *Guía: 1897,* pp. 333–37. These pages present an excellent summary of the purposes and components of the Farm Bureau.

63. A *Real Decreto* of 8 July 1884 made more specific the general instructions of the earlier 1881 *Orden.*

Agriculture in 1889, followed at more or less close intervals, by the opening of five agricultural experimentation stations at La Paz in Panay, San Nicolas in Cebu, Daraga in Albay, Ilagan in Isabela, and Vigan in Ilocos Sur.[64] The last of its initiating duties to be fulfilled was the publication of a periodical devoted to the advance of Philippine farming. The first issue of the *Boletín oficial agrícola de Filipinas* appeared in January 1894.[65]

The crowning achievement of the Farm Bureau came with the establishment of the Escuela de Agricultura.[66] This, its principal teaching unit, began operations on 2 July 1889. Occupying a modest-sized piece of property in the Manila suburb of Ermita, it proposed to help Filipinos become effective and efficient farm operators. This aim was to be achieved in two phases. First came systematic instruction concerning best practice in Europe, along with whatever modifications the archipelago's own model farms and experimental stations recommended for their Philippine application. Periods of actual farm work followed the teaching sessions. The school was not designed to produce agricultural engineers, nor to conduct research in the manner of the present rice institute at Los Baños.

The Escuela de Agricultura operated two programs. The first and most important was a three-year sequence in farm management, leading to the title of *perito agrícola.* Table 6 lists the courses which this sequence comprised. Significantly, candidates who wanted this title had to demonstrate the possession of suitable secondary-level schooling in geometry, trigonometry, drawing physics, and chemistry, prior to entrance. The other program, which conferred the title of *capataz de cultivo,* concerned itself with the preparation of field foremen and livestock supervisors.

64. *Guía: 1897,* pp. 514 ff. The earlier *Guía: 1885* (pp. 609–11) contains further data relative to the two model farms. The Estación Agronómica de Iloilo supplied the newspaper *El Eco de Panay* with eight kinds of weather measurement each day (see, for example, the issue of 29 March 1894).

65. U.S. Philippine Commission 1899–1900, *Report,* vol. 4 (1901) pp. 9–10. See also *La Ilustración Filipina* (14 February 1894). Prior to the establishment of the Farm Bureau, the group concerned with the promotion of Philippine agriculture was the Real Sociedad Económica de Amigos del Pais. This association, for example, had published in 1869 a 55-page booklet entitled *Medios que el Gobierno y La Sociedad Económica pueden emplear para obtener el desurello de la agricultura en el país.* The author was D. H. de Keyser y Muñoz, and the printer was Sto. Tomas University (AHN, Islas Filipinas: Fomento, leg no. 476).

66. *Guía: 1897,* pp. 333–37. As with most other Philippine schools of the period, the academic year here ran from early July to the end of March.

Table 6. Curriculum Leading to the Title of *Perito Agrícola*, Manila, 1889

Year 1	Elementary soil management
	Farm problems in mathematics
	Topography – Land surface configurations
	Drawing
Year 2	Advanced soil management
	Principles of farm administration
	Machinery in plans and drawings
	Use and maintenance of machinery
	Practice
Year 3	Rural economy
	Farm law
	Farm accounting
	Field and building layout
	Practice

SOURCE: *Guía: 1898*, pp. 333–37.

Although the Manila institution provided overall direction, most of the students who pursued this title appear to have taken their training on the model farms at La Carlota and San Pedro Magalang, and at the experimental stations in Panay, Cebu, Albay, Isabela, and Ilocos Sur.

The response to this new and urgently needed kind of career development opportunity seems to have been only modest. Farmers themselves tended to be skeptical, while nonfarmers were unsure what precise value the programs might be to them. On hand for the initial term of the Escuela de Agricultura in July 1889 were 55 students. Of these, 33 were registered for the *perito* work and 22 for the *capataz* sequence.[67] Those who actually completed the two programs in the second graduating class, that of 1892-93, numbered respectively six and eight.[68] About that same time, the Manila school staff comprised seven persons. These were the director, three agricultural engineers, and three holders

67. Ibid. In the following year there were 18 *perito* and 32 *capataz* candidates.
68. *La Ilustración Filipina*, 8 July 1893.

of the perito title.[69] An agricultural engineer directed each of the model farms and experimental stations.[70]

CAREER PREPARATION OUTSIDE THE VOCATIONAL SCHOOLS

During the late nineteenth century, Philippine educational institutions, other than the ones specifically dedicated to the purpose, conducted a considerable amount of organized teacher training. A similar phenomenon occurred with respect to the readying of the young for other kinds of occupations. Two such types of program active at the time deserve mention because of their very real and rather extensive economic value to the country. These were the perito sequences in business administration, surveying, and mechanics offered by the Ateneo and Santo Tomas, and the needlework instruction provided by most, if not all, the girls' colegios.

Pressed by Madrid to supplement their B.A. curricula with more concrete and directly useful instruction, both the Ateneo and Santo Tomas operated all three of the above-named technical sequences.[71] Beginning about 1867, these so-called *estudios de aplicación* made their entrance into the two schools at varying dates. The Ateneo, for example, conferred its first business administration title in 1870, its first surveying title in 1875, and its first mechanics title in 1886.[72] Students could choose any one of the three and pursue it either alone or along with their baccalaureate studies.

These vocationally oriented programs attracted surprisingly large enrollments. The Ateneo alone awarded the perito title to as many as 339 during the three-decade era 1870-1900. Table 7 shows the numbers and classification of these titles for six individual years. Business administration, it will be noticed, was the clearly preferred sequence at that institution.[73]

69. *Guía: 1897*, pp. 514 ff.
70. *Guía: 1892*, pp. 730 ff.
71. *Estudios de aplicación* formed an integral part of the curriculum ordered introduced into Philippine colegios of the first class by the Madrid legislation of 1867, the *Programa y reglamento de segunda enséñanza para las Islas Filipinas* (Manila, 1867).
72. M. Rávago, *Reseña histórica de las fiestas jubilares del Ateneo de Manila* ... (Manila: Ateneo de Manila, 1910), p. 109 and the appendices.
73. Ibid.

Table 7. *Perito* Titles Conferred by the Ateneo Municipal in Certain Individual Representative Years, 1870–1895

Year	Business Administration	Surveying	Mechanics
1870–71	4		
1875–76	3	3	
1880–81	10	3	
1885–86	10	3	3
1890–91	6	1	5
1895–96	16	0	4

SOURCE: M. Rávago, *Reseña histórica de las fiestas jubilares del Ateneo de Manila* (Manila: Ateneo de Manila, 1910), p. 109 and appendix.

Equally complete statistics are not available for Santo Tomas. Graduation data from that school do, however, appear in the *Guías* for 1885 and 1890. According to these publications, 23 perito titles were granted there in 1884 and 59 in 1889.[74] In both of these Santo Tomas groups, surveying proved to be the most popular sequence.

Far more extensive in student coverage than the perito programs at the Ateneo and Santo Tomas was the similarly oriented practical skills training offered by the girls' colegios of the country. This organized effort at career development for women, as it was viewed in those days, while including exercises in household management and child care, stressed the acquisition of sewing skill. Proficiency in needlework, it was thought, would bring the girl a wide range of benefits. It would enable her to provide not only for her own clothing requirements, but also for those of her family and her home. Such skill could, moreover, be put to commercial use through the operation of a community tailoring or dress-making shop.

Foremost in promoting this very useful type of learning experience among the 22 girls' colegios of the archipelago were the

74. *Guía: 1885*, p. 269; *Guía: 1890*, p. 174.

11 establishments directed by the Daughters of Charity. These nuns, notwithstanding their deep religious interests, were a down-to-earth band of women. They were thoroughly familiar with the material needs of healthy family living. Table 8 outlines the needlework instruction which their schools provided in 1883. It complemented the regular work in letters, numbers, manners, and morals.

Table 8. Vocational Training Sequence, Colegios of the Daughters of Charity, 1883

Year 1	*Introductory needlework*
	The basic stitches
	Backstitching, darning, knitting
	Hem construction, measurement
Year 2	*Intermediate needlework*
	Embroidery and crocheting
	Simple men's clothing
	Simple women's clothing
Year 3	*Advanced needle and art work*
	Machine sewing
	Clothing design and fit
	Pattern drawing and cutting
	Lace making
	Art Products in wax and paper

SOURCE: E. Fernández Arias, ed., *Memoria histórica estadística sobre la enseñanza secundaria y superior en Filipinas . . .* (Manila, 1883), pp. 111–14.

In summary, although major advances were indeed scored during the late nineteenth century in both the enrollment size and the technical quality of vocational education, the vast majority of new workers throughout the world continued to receive their training on-the-job in the traditional apprenticeship mode. Only the great industrial nations were beginning to make truly broad use of formal preservice job preparation. Even in these countries, however, the pace was slow, partially because of the heavy expense which this kind of instruction normally entailed, and partially because of the social disdain with which it was often surrounded. When the Philippine achievement in vocational education is considered in the

light of the world situation which has just been described, it is seen to have been genuinely substantial. It reveals an awareness of the country's economic needs and a readiness to try to meet them, howsoever slender the available resources.