In-House Training during Japan’s High-Growth Period: Examining the Case of Fuji Iron & Steel

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Abstract
This paper explores changes in the in-house training systems at major firms in postwar Japan. In the 1950s, companies usually hired new middle school graduates as technicians. As a growing proportion of students began going on to high school, however, companies started struggling to find middle school graduates to fill positions. The recruitment demographics shifted; by the late 1960s, high schools had begun displacing middle schools as the primary source of new technicians. Approaches differed by company and location, however. One example was Fuji Iron & Steel’s Muroran Works in Hokkaido, where the increases in high-school attendance rates trailed the proportional growth on Japan’s main island. In that context, therefore, the Muroran Works continued to provide training and education for middle school graduates into the 1960s. However, changes began to occur shortly thereafter. In FY1961, the facility changed the name of its Wanishi Private Technical School to Fuji Iron & Steel Muroran Technical High School and extended the course of study from two years to three years. In FY1964, meanwhile, the school introduced correspondence courses. The changes effectively altered the nature of the institution, allowing students at Fuji Iron & Steel Muroran Technical High School to obtain high school–graduate qualifications. Mitsubishi Electric offers an example of another approach. Placing its focus on helping technical trainees cultivate the abilities they would need to succeed as versatile, multi-skilled workers with a broad grounding in liberal arts, the company made that refinement the core of its education and training efforts.

Keyword: in-house training systems, multi-skilled workers, Fuji Iron & Steel, Shibaura Machine Works, Mitsubishi Electric
I. Introduction
The education and training of new employees is not always the work of the manager class. The matter of who educates new graduates (not mid-career recruits)—whether it should be managers, labor unions, or the workers themselves providing instruction—depends heavily on the labor practices that have formed over time in the country in question. Kupets (2018) showed how managers in former socialist states offered training that helped mitigate a shortage of experienced workers and contributed to better productivity levels. A study by Kennedy, Drago, Sloan, and Wooden (1994), on the other hand, looked at in-house training in Australia and analyzed how trade unions shape the training programs that companies provide. Examining in-house training in Japan since the country’s high-growth period (from the mid-1950s to the early 1970s), Ueshima (2014) found that while in-house training had significant implications for male workers, skill-development programs often excluded female workers.

In this paper, I concentrate on how in-house training systems at large-scale enterprises evolved in postwar Japan. In the 1950s, companies usually hired new middle school graduates as technicians and field workers. Recruits at major companies would receive education and training at in-house training and development facilities, gaining skills as “apprentices,” while those at small and medium-sized enterprises began on-the-job training (OJT) as soon as they started working—but new high school graduates embarked on training for clerical jobs and technical jobs, which put them on a different developmental track from middle school graduates. As a growing proportion of students began going on to high school, companies gradually started struggling to find capable middle school graduates to fill positions. The recruitment demographics shifted; by the late 1960s, high schools had begun displacing middle schools as the primary source of new technicians and field workers.

In 1957, a recruiting director at Kobe Steel explained the ramifications of the changes. “I put out an internal memo about hiring a few apprentices out of middle schools like I always did, but the president ended up saying that we’d be better off just not recruiting middle school graduates anymore,” he said. “The idea was that it’d be better to use high school students, who already had a better basic, general education, than spend three years educating middle school graduates. Knowing what I did in human resources, I didn’t think we were ready to overhaul everything all at once, so I asked for a year to make the transition.” A year is what the director got, as Kobe Steel indeed went ahead with its plan to start hiring high school graduates as field workers in 1959. The director attributed his initial hesitation about making the switch to questions about employee treatment. “For me, the biggest issue was how we’d be handling the recruits down the road,” he said. “I felt that unless the company made its policies explicitly clear, we’d see recruits complaining or just plain quitting over what they saw as unfair treatment” (Roundtable discussion 1968, 7).

As technological innovations spawned demands for new types of workers and the increasing percentages of students going on to high school shrank the recruiting pool of middle school graduates, major companies soon confronted the need to abandon the
conventional hiring approach of the prewar and wartime periods—recruiting new middle school graduates as apprentices, putting them through around three years of in-house education and training, and tracking them to become middle-ranking technicians—in favor of a different development system. However, that shift took a wide variety of forms from company to company and location to location.

Sections 2, 3, and 4 below analyze the transitions in the training and development facilities at the Muroran, Kamaishi, and Hirohata Works in the organization of Fuji Iron & Steel, which originated via the dissolution of Japan Iron & Steel in 1950. In examining the changes, I look at the different ways in which the company handled the shift from filling its field-worker positions with middle school graduates to hiring high school graduates. The fifth section then places Fuji Iron & Steel’s approaches in comparative context by examining similar processes at Shibaura Machine Works, Mitsubishi Electric, Fuji Electric, and Ikegai Ironworks.

II. Wanishi Private Technical School, Fuji Iron & Steel Muroran Technical High School, and Nippon Steel Corporation Muroran Technical High School

1. Background

In-house education at the Fuji Iron & Steel Muroran Works dates back to the opening of the Wanishi Works Private School for Working Youths in September 1938.¹ When the Japanese government issued the Order to Establish Technician-Training Programs at Factories and Workshops in March 1939, the education and training facilities at the Muroran Works added technician-training programs to accompany its existing education for working youths. In FY1943, the establishment organized its educational offerings into three stages covering a span of five years—a general course (two years), intermediate course (two years), and advanced course (one year). The employees who completed the entire curriculum with high marks earned spots in the Engineer-Development Department at the Wanishi Works. Serving to give the company a steady supply of middle-ranking engineers, the Engineer-Development Department offered six months of quality education (akin to the education at a first-class technical school). The department operated in that mold from its inception in April 1940 to October 1945, producing a total of 265 graduates in six cohorts.

In the wake of World War II, the Muroran Works created an Employee Training Institute in December 1945. The institute initially comprised three divisions: a school for working youths, a department for training staffers, and a department for training plant workers. That original setup remained in place for just five months, however, as apprentice education commenced in April 1946. With that, the institute reorganized its educational structure into a school for working youths (education in accordance with the School for Working Youths Order), a development course (apprentice education), and a

¹ The following description is based on Wanishi Private Technical School, ed., 1959, 1-3, and Nippon Steel Corporation, Muroran Technical High School, Editorial Committee, ed., 1975, 1-4.
training course (employee education outside the apprentice curriculum). The Wanishi Works Private School for Working Youths closed in March 1948, completing a roughly decade-long run (since FY1938) that turned out 1,134 total graduates. The Employee Training Institute shut its doors in 1951 after graduating four cohorts. The dissolution of Japan Iron & Steel created Fuji Iron & Steel in April 1950, and the Fuji Iron & Steel Wanishi Works became the Fuji Iron & Steel Muroran Works the following year. The company then formed an Education Committee responsible for both providing education and handling school affairs under the leadership of Works Director Itō Masao in June 1951.

2. Wanishi Private Technical School

Wanishi Private Technical School, a “school for working youths,” drew on Japan Iron & Steel’s experience in providing education at the Employee Training Institute and offered instruction in a variety of schooling formats under the provisions of the School Education Act. Opening in April 1950, the school used the same location and building as the now-defunct Employee Training Institute. In charge of the new establishment was the school affairs director on the Educational Committee (Wanishi Private Technical School, ed. 1959, 5–6). According to its school regulations, Wanishi Private Technical School set out to “provide students with the requisite technical education for iron-making and a general higher education” (Wanishi Private Technical School, ed. 10). The school, a full-day institution with a two-year curriculum, admitted boys who had graduated from middle schools. While the students were not technically “employees” of the Muroran Works while enrolled, they did receive company scholarships in the amount of 2,000 yen per month. (Wanishi Private Technical School, ed. 58, and Nippon Steel Corporation, Muroran Technical High School, School History Editorial Committee, ed. 1975, 9).2

The school held substantial prestige in the local community. As Table 1 shows, the ratio of applicants to enrollment slots was between 5:1 and 9:1 on a yearly basis and even reached 10.1:1 in FY1959. A student from the school’s fourth class (enrolling in FY1953) remembered Wanishi Private Technical School’s reputation. “It was extremely hard to get into Wanishi Technical School. I remember how middle schools would limit the number of students taking the entrance examination to the school’s enrollment capacity. But even so, the examinees outnumbered the open slots by something like ten to one” [6.7:1, according to Table 1], he said. “Everybody looked at you with respect—and a bit of envy—when they heard you were a student at Wanishi Technical. . . . I rode the bus every day with kids from the general high schools (Sakae, Shimizugaoka, and Shōgyō), and I wore my Wanishi Technical school cap with pride" (Nippon Steel Corporation, 149).

2 A member of the school’s second class of students (enrolling in 1951) recalled that the “monthly scholarship from the school came to 2,000 yen. We would end up taking home 1,500 yen or so after they deducted our textbook fees, but that was still more than enough for a monthly allowance” (Nippon Steel Corporation, Muroran Technical High School, School History Editorial Committee, ed. 1975, 148).
Although the school exuded prestige, the curricular design led to some problems. "What the school didn't offer was a way for students to earn high school–equivalent qualifications," one student in the school's third cohort (enrolling in FY1952) explained, "so you had to go to night school if that's what you wanted" (Nippon Steel Corporation, 149). Among students, then, the understanding was that aspirations for high-school equivalency meant going for additional part-time schooling (or, in other words, “dual schooling”).

According to a student in the school's fifth class (enrolling in FY1954), getting into Wanishi Technical came with mixed emotions. "The day of the entrance ceremony, I felt
like I'd gotten two tickets," he recalled. "One I was so happy to have: the opportunity to study at a school that had the best and brightest students in the field. The other ticket, though, put me on the fast track to a future that was pretty much laid out for me, something I wasn't so happy to have at such a young age" (Nippon Steel Corporation, 150). Studying at Wanishi Private Technical School, one of the premiere schools in the area, was obviously a source of pride for many of the students—but the sense of frustration with the school's nature as a funnel into a specific corporate setting as opposed to a conventional high school was evident as early as the mid-1950s. For one student in the following year's class (enrolling in FY1955), understanding the school's identity as a company institution was a sobering realization. "Before I enrolled at Wanishi Technical School, I had no real idea that it was a 'company school'; I'd just heard about it from my friends," he recalled. "I'd imagined it'd just be like going to a normal school, so I was a little thrown for a loop when I started. I'd think of my friends going to regular schools, and I’d even feel jealous of them at times. But I did know that there'd be a job waiting for me when I graduated, which is something you couldn't always say for other schools back then—and the reason I decided to enroll" (Nippon Steel Corporation, 150–151). The student's words echoed a sentiment that became increasingly common as the proportion of students choosing to enroll in high schools climbed.

A look at the occupations of the older brothers and fathers of the 120 students at Wanishi Private Technical School in February 1959 (students enrolling in FY1957 and FY1958) shows that 69.2% (83 individuals) were employees of the Muroran Works (Wanishi Private Technical School, ed. 1959, 54). In Table 1, meanwhile, one can see that 45.9% of all the applicants to the school in FY1957 and FY1958 (477 of 1,039 individuals) were children of Muroran Works employees—and children of employees had higher acceptance rates than those with no parental ties to the establishment.

One of the distinguishing characteristics of the education at Wanishi Private Technical School was its rejection of educating single-skilled workers, something the institution itself made an emphatic point of. Aiming specifically to "train multi-skilled workers with broad-ranging skills, capable of adapting to any line of work at the Muroran Works and applying the fundamentals they acquire to flourish in the future," the school noted that the "conventional wisdom attaches a greater importance to 'school methods' that mark a clear departure from simple employment in a company." The school continued its explanation of the reasoning for its educational approach, saying that school methods "make it possible to align educational content with the needs of the Works and the local community, free of any restraints that corporate affairs may place on curricular design and development. Therefore, the institution attracts promising applicants who eagerly compete for admission." Instead of tailoring its educational content to single, specific skills for immediate benefits, the school prided itself on being "the only educational institution of its kind among the facilities of all the major companies in Hokkaido" and drawing a "clear distinction from other corporate institutions in the aspirations it holds in such high regard" (Wanishi Private Technical School, ed., 23).
Support for that focus on cultivating multi-skilled workers came from the field as well. "On-site supervisors have voiced their preference for multi-skilled workers," school documents read. "Not only does the existing school format prove far more effective than training single-skilled workers, they say, but the comparative advantages of the school approach also continue to grow over time" (Wanishi Private Technical School, ed., 24).

Despite its "school" format, the curriculum still skewed toward skill training. The two-year program comprised 1,080 hours in basic subjects, 840 hours in technical subjects, and 1,536 hours in training, which thus occupied the largest share of the students' time. In the latter half of their second year in the program, students spent as many as 576 total hours on practical training (Wanishi Private Technical School, ed., 22, and Nippon Steel Corporation, Muroran Technical High School, School History Editorial Committee, ed. 1975, 57). However, the school also noted that the "practical training does not involve the students in actual worksite processes. We consider all the facility operations at the Works to be ‘living training environments,’ classrooms in the field.” The school administration began working to iron out the school-worksite dynamic in FY1958 by selecting eight employees from the field and three teachers from the school to serve as on-site instructors, who also convened for monthly study-group meetings to discuss issues in practical training (Wanishi Private Technical School, ed. 1959, 30).

Almost every student who graduated from Wanishi Private Technical School in the years 1952 to 1958 took jobs at the Fuji Iron & Steel Muroran Works (Wanishi Private Technical School, ed., 56–57), and those graduates tended to stay with the company: only 12 had left their positions by February 1959, amounting to an extremely low turnover rate (Wanishi Private Technical School, ed., 56). That level of retention suggests that the school had achieved its founding purpose.

The graduates in those seven classes (1952–58) landed in positions spanning a diversity of job types. A total of 51 graduates secured positions in the “analysis” category, the line of work with the largest number of new recruits, with others going into experimentation (38 graduates), inspection (35), precision fitting (34), crane operation (33), machine maintenance (19), electric machine operation (18), signals (17), machine fitting (16), and electric maintenance and rolling (both 15). Evidently, the fields of analysis, experimentation, inspection, precision fitting, and crane operation were the primary destinations for the 1952–58 graduating classes at Wanishi Private Technical School (Wanishi Private Technical School, ed., 56–57). A look at graduate assignments by affiliation in February 1959 shows a relatively even distribution between the most common destination sections: Heat Control (40 graduates) narrowly topped Rolling 1 (36), with Maintenance (34), Rolling 2 (29), and Iron-Making, Machining, and Electric Power (all at 27) rounding out the organizations with the highest numbers of graduates (Wanishi Private Technical School, ed., 56).

3. Fuji Iron & Steel Muroran Technical High School
Unlike Japan’s main island, where recruiting demographics were undergoing significant shifts, Hokkaido still had a steady stream of middle school graduates entering the working
ranks in the 1960s. That strong employment base sustained the existing apprentice-education framework for middle school graduates, something that executives at the Muroran Works were adamant about keeping in place. However, some changes did occur. In FY1961 year, Wanishi Private Technical School officially became Fuji Iron & Steel Muroran Technical High School and extended its term of study from two years to three years. The institution may have been able to maintain its policy of admitting high-caliber middle school graduates, but the changes of 1961 imply that the increasing rates of students going on to high school made it impossible for school administrators to go about business as usual. Another factor playing into the curricular overhaul was the element of emerging technologies; a two-year program provided too little time to help students master the latest innovations. The fact that students were still under the age of 18 after completing their two-year course of study meant that graduates could not legally work in staggered shifts, which posed a serious problem for company management. A combination of internal and external factors thus prompted the school’s first reform—a name change and the extension of the course term to three years—in FY1961. A second set of major changes followed in 1964, including revisions to the course-specific study-hour requirements, the addition of correspondence courses, and the construction of a dormitory that housed all first- and second-year students (Nippon Steel Corporation 1975, 22–23, 25).

Table 2 illustrates the impact of those changes in numerical terms. From the school’s opening in 1950 to FY1959, the general course saw its share of the total class hours expand but only incrementally; the course’s relative weight in the curriculum remained at 31% in the last year of the decade. When the institution became the three-year Fuji Iron & Steel Muroran Technical High School, however, the class hours in the general course—the closest offering to a standard high-school education at the institution—jumped to 43% in FY1962 and 58% by FY1967. The school adapted its outlook to the shift, too, declaring that it aimed to “provide students with the same type of basic scholastic aptitude that a technical high school offers” (Nippon Steel Corporation, 23). Meanwhile, the percentage of class hours in the training course fell to 36% in FY1962 and plummeted to 12% in FY1967. The transition to a three-year course of study increased the total number of training-course hours to 2,048 in FY1962, but revisions to the course-specific hour requirements in FY1964 reduced the total training-course hours to 658 (see Table 2). One student who enrolled in FY1962 remembered how the changes affected the reality for students: “The school had just gone from a two-year setup to a three-year setup, and it was easy to tell that the administration was trying to take in-house education in a whole new direction. I remember the teachers really having to push themselves hard; after all, the curriculum combined the general subjects you’d take at a normal high school plus the special subjects you’d find at a technical high school. Looking back, it kind of seems like the school might have been overreaching a bit. It was definitely a heavy course load” (Nippon Steel Corporation, 153).

The switchover to a three-year curriculum also brought sweeping improvements to the training programs themselves. Chemistry classes made their way into the first-year
schedule, for instance. Second-year students began year-round training in machines (repair and tools), electricity, founding, and automobiles, which had earlier only been part of the first-term lineup. When students entered their third years, they completed a “circuit training” regimen at six worksites—iron-making, sintering, coke, steel plating, converters, and maintenance [eight days per location]—during the first term to develop a familiarity with actual work operations. They then went on to train in measurement and metallurgy (to acquire skills in measurement, physics, metallurgy, and machine operation) in the second term and finally focus on special training (concentrating on specific skills that they would need for their individual post-graduation assignments) in the third and final term (Nippon Steel Corporation, 32–33).

However, the FY1964 reforms slashed the amount of time students spent in the training course—the total hour count dropped to just 658 (Table 2). Accompanying the cut in overall duration were far-reaching modifications to the educational curriculum. In addition to instituting three-shift training (lasting one week) in the second year of the program, the administration also consolidated the practical, on-site training that normally took place in students’ third years into the maintenance division because the company’s recent facility expansions had created the need for more employees with maintenance and servicing skills. Second-year students also began learning crane operations and gas welding, two more new additions (Nippon Steel Corporation, 33–35).

Table 2: Class hours by course

| Courses         | Wanishi Technical School | Fuji Iron & Steel Muroran Technical High School | Nippon Steel Corporation Technical High School |
|-----------------|--------------------------|-----------------------------------------------|-----------------------------------------------|
|                 | FY1950                   | FY1959                                        | FY1962                                        | FY1967                                        | FY1970                                        |
| General         | 912 (26.4)               | 1,080 (31.3)                                 | 2,417 (42.8)                                 | 3,193 (58.1)                                 | 2,068 (36.7)                                 |
| Technical       | 1,008 (29.2)             | 840 (24.3)                                   | 1,175 (21.1)                                 | 1,363 (24.8)                                 | 1,692 (30.0)                                 |
| Training        | 1,536 (44.4)             | 1,536 (44.4)                                 | 2,048 (36.1)                                 | 658 (12.0)                                   | 1,598 (28.3)                                 |
| Special education|                          |                                               |                                               | 282 (5.1)                                    | 282 (5.0)                                    |
| Total           | 3,456 (100.0)            | 3,456 (100.0)                                | 5,640 (100.0)                                | 5,499 (100.0)                                | 5,640 (100.0)                                |

Source: Nippon Steel Corporation, Muroran Technical High School, School History Editorial Committee, ed. (1975), 57.

Note: (1) Wanishi Technical School: Classes 6 hours a day, 6 days a week, 48 weeks a year.
(2) FY1962: Classes 40 hours a week, 47 weeks a year; FY1967: Classes 39 hours a week, 47 weeks a year, with 7 hours of classes on weekdays and 4 hours of classes on Saturdays.
With the overhaul in FY1964 also came the introduction of correspondence learning. That same fiscal year, the administration teamed with Sapporo Minami High School to establish a distance-learning system that would enable students to earn high-school qualifications as they studied at Fuji Iron & Steel Muroran Technical High School. Three years later, in August 1967, the correspondence course at Sapporo Minami High School spawned a new high school altogether: Hokkaido Yūhō High School, a distance-learning-only institution that grew out of and eventually spun off from the Sapporo Minami organization. Students in Yūhō High School’s distance-learning program would write and submit monthly reports and spend roughly 20 days a year in class at an affiliate high school (Muroran Sakae High School). Fuji Iron & Steel Muroran Technical High School had classrooms available, so it brought teachers from the affiliate school over and added them to the institution’s faculty so that Muroran Technical High School students could get help with their reports and take face-to-face classes at their home school. The correspondence course at Fuji Iron & Steel Muroran Technical High School had a four-year period of study, which meant that students would spend an extra year of study after completing the standard three-year curriculum, but the administration decided to limit the course load for fourth-year students to around two subjects and consolidate schooling into a single block that would not interfere with the students’ shifts. The creation of the correspondence-course arrangement effectively solved the “dual schooling” issue. Students aspiring to obtain high school–equivalent qualifications no longer needed to attend night classes or separate part-time schools; until the relationship with Yūhō High School became a joint skill-development program in FY1970, every graduate of Fuji Iron & Steel Muroran Technical High School went through a general course in high school and obtained high-school equivalency (Nippon Steel Corporation, 26–27).

4. Nippon Steel Corporation Muroran Technical High School
When the Muroran Works began hiring large numbers of technicians with high school diplomas in the late 1960s, questions about the purpose of the Fuji Iron & Steel Muroran Technical High School and its focus on recruiting middle school graduates reemerged. As Table 1 shows, the school cut its enrollment slots for new students to between 40 and 50 from FY1964 on. Analysis suggested that the drop in capacity stemmed from the company’s decision to keep the existing framework in place while making a shift toward education for maintenance-oriented jobs. As faster, higher-performance production facilities entered the picture and automation technologies took major strides forward, Fuji Iron & Steel needed to train technicians to maintain and preserve their changing capital assets—and reworking its approach to schooling was how it chose to meet that need. Another name change followed that structural shift. After the creation of Nippon Steel Corporation in 1970, Fuji Iron & Steel Muroran Technical High School adopted the new name of “Nippon Steel Corporation Technical High School” (Nippon Steel Corporation, 40).

The reforms in FY1970 involved several modifications to the curriculum. To help steer training efforts toward producing human resources for the maintenance division, the
administration split the course of study into the machinery department and electricity department, brought the number of class hours in the general course to the bare minimum for correspondence courses (except for classes in mathematics, physics, and chemistry), increased the number of practical training hours, and required third-year students to spend three days a week doing practical training in the maintenance division. The balance between the general course and the training course thus tilted closer toward an equilibrium; after the reforms, as Table 2 indicates, the general course accounted for a smaller percentage of total hours than before (37%) while the training course rose to a 28% share. Fuji Iron & Steel Muroran Technical High School had taken steps to liken itself more closely to a full-fledged technical high school through its shakeup in FY1964—but as soon as the institution began operating under the Nippon Steel Corporation Muroran Technical High School name, it shifted its curricular weight back toward practical training. Graduates coming out of the new structure headed into jobs in the maintenance division, primarily, but the company also assigned some graduates to concurrent positions in the operations division and had them rotate between the two divisions as much as possible (Nippon Steel Corporation, 41).

By the 1970s, the Muroran Works had begun enhancing the performance of its production facilities and automating numerous operations via computer technologies. The advances also had implications for Nippon Steel Corporation Muroran Technical High School, where a new Skill Development Center went up in a corner of the school grounds in March 1973. With the new facility complete, the school boasted a full complement of training facilities for instruction in maintenance tasks, inspections, and more, easily surpassing what conventional training environments could offer (Nippon Steel Corporation, 46–47). In 1971, however, Japan sunk into a major recession. The impact hit the steel industry hard, and the Muroran Works soon found itself with no choice but to reduce its production capacity. Redundancy issues set in at every worksite, leading top management to stop hiring high school graduates for technical positions in FY1972. Given how the murky circumstances clouded estimates of how many employees the company would need in three years’ time, administrators struggled to determine how many students to admit in the present. There was also a degree of disconnect between the types of graduates that the school was trying to produce and the types of new employees the company was looking for. Despite reforms having shifted the educational focus of Nippon Steel Corporation Muroran Technical High School toward training future maintenance personnel, the company stopped hiring high school graduates in FY1972; as a result, most of the graduating class of March 1972 went into jobs with no connections to maintenance. The administration also decided to reduce the number of enrollment slots for FY1972 from 80, its initial plan, to 50 (Nippon Steel Corporation, 52).

Against that backdrop, discussions about whether to keep accepting students in FY1973 began in the spring of 1972. In mid-August, the administration eventually decided to suspend new enrollment. The talks then turned to the feasibility of new admissions in FY1974 and beyond. Personnel who had made the rounds to local middle schools were pessimistic about the possibility of resuming admissions, having seen for
themselves that the recruiting pool of middle school graduates was quickly drying up: the percentage of students going on to high school had risen from 63.9% in FY1966 to 80.7% in FY1972. It was obvious that high school was steadily becoming the default post-graduation option for middle school graduates (Nippon Steel Corporation, 54–55).

Another look at Table 1 illustrates significant shifts in application figures from the late 1960s to the early 1970s. The proportion of applicants who were children of employees went from 46% in FY1966 to just 10% in FY1972, while the ratio of applicants to enrollment slots sagged to around just 3:1 in FY1971 and FY1972. While the numbers might appear to suggest that employees wanted their children not to follow their footsteps, the drooping numbers of applicants from employees’ families stemmed more from parents gradually coming to the realization that their children would be better off graduating from high school first if they wanted to work at the Muroran Works. The changes all but spelled the end for the Nippon Steel Corporation Muroran Technical High School. A high-ranking official from the Muroran Works made the closure official with an announcement on February 15, 1973. The school’s alumni association, enrolled students, and their families knew of the pending closure in advance, and both the school and the alumni association notified all past graduates accordingly. The announcement drew the curtain on the history of the school, which had formed 35 years prior with the establishment of the school for working youths, grown into Wanishi Private Technical School 12 years later, and built a legacy as one of Hokkaido’s most prestigious company schools.

The data on the school’s cumulative graduates through December 1974 highlights several interesting points. Of the 1,213 total graduates, 272 (22.4%) had relocated to works in Nagoya, Oita, Kimitsu, and Hirohata. On the other hand, 119 (9.8%) had left their positions (Nippon Steel Corporation, 139). As Table 1 shows, the school turned out 584 graduates under the Wanishi Private Technical School name (from FY1951 to FY1960), 360 of whom were still working at the Muroran Works in December 1974. The graduates’ work assignments covered a broad scope, with the largest proportions in the Electrical Work Section (30 graduates), Analysis Section (23), Mechanical Work Section (23), and Continuous Heating Plant (21). Fuji Iron & Steel Muroran Technical High School, the school’s name from FY1962 to FY1968, produced a total of 389 graduates. Of that collective set, 248 were on the roster at Muroran in 1974. The most common affiliations for the Fuji Iron & Steel Muroran Technical High School graduates were the Coke Plant (27 graduates), Iron Production Plant (24), Steel Bar Plant (19), Power Section (19), and Steel Production Plant 2 (16). A vast majority of the 240 graduates coming out of the institution between FY1969 and FY1973 (176 graduates) were at Muroran in 1974, with notable concentrations of workers in Mechanical Work Section (20 graduates), Maintenance Section 2 (15), and Electrical Work Section (13) (Nippon Steel Corporation, 138–139). As I noted earlier, the school’s later realignment (as Nippon Steel Corporation Muroran Technical High School) toward specifically training a larger workforce of future maintenance workers became a moot point in the wake of the oil crisis; instead of
graduates heading straight into maintenance, the company ended up assigning graduates to a variety of worksites across the production process as it adapted to the economic slide.

In 1974, the student who enrolled at the school in 1952 and took night classes in pursuit of high-school equivalency remembered his reaction to hearing that his alma mater was closing. “So much has changed since I was there. Now, more than 80% of all middle school students go on to high school—it’s almost compulsory. You even see young employees driving themselves to work in their own cars,” he said, overcome with emotion. “We’re so well off now that we don’t know what to do with all our extra rice. When I heard that the school was closing, I wasn’t surprised. All I could do was nod my head” (Nippon Steel Corporation, 149). The rise and fall of Japan’s economic miracle essentially governed the trajectory of company-established schools in postwar Japan.

III. Kamaishi Works Development Center

1. Background

The Kamaishi Works Private Development Center for Youths opened in August 1927 with a faculty of eight instructors, an inaugural class of 66 students, and a training period of four years. Students completed 400 hours of drills, 200 hours in the general course, and 100 hours in the vocational course, which focused on learning company work (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed. 1975, 12).

In accordance with the School for Working Youths Order, Japan Iron & Steel established a School for Youths—an institution that offered half-day schooling three days a week—as the successor to the Development Center for Youths in April 1935. Another piece of legislation, the Order to Establish Technician-Training Programs at Factories and Workshops, prompted the creation of the Technician Training Institute in June 1939. Students who had completed the first term of the School for Youths curriculum either enrolled in the Technician Training Institute or stayed at the School for Youths for the second term. Those who went on to study at the Technician Training Institute became “apprentices” and studied on a full-time (full-day) basis. Initially, the period of study at the Technician Training Institute ran for two years and nine months and comprised 123 hours in an ethics and civics course, 489 hours in a general course, 657 hours in a technical course, 333 hours of drills, and 4,851 hours of practical training (with students doing basic training in their first years and applied, on-site training in their subsequent years). The school would gradually reduce the period of study over time, however. All in all, 588 students in seven cohorts graduated from the Technician Training Institute until the establishment’s closure in February 1946, roughly two years before the School for Youths also closed its doors in March 1948 (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 21–27).

2. The Plant-Worker School and Development Center

In April 1946, Japan Iron & Steel created a two-year, full-time (full-day) Plant-Worker School to replace the recently shuttered Technician Training Institute. The new institution
Table 3: Numbers of graduates, retirees, and employees of the training center  
(People, %)  

| Year | Graduates (1) | Retirees as of May 1974 | Employees of Nippon Steel Corporation as of May 1974 (2) | Retention ratio (2)/(1) |
|------|---------------|------------------------|-------------------------------------------------------|------------------------|
| 1947 | 46            | 11                     | 35                                                    | 76.1                   |
| 48   | 40            | 11                     | 29                                                    | 72.5                   |
| 49   | 38            | 8                      | 30                                                    | 78.9                   |
| 1950 | 38            | 10                     | 28                                                    | 73.7                   |
| 51   | 36            | 5                      | 32                                                    | 88.9                   |
| 52   | 43            | 8                      | 35                                                    | 81.4                   |
| 53   | 48            | 6                      | 42                                                    | 87.5                   |
| 54   | 37            | 3                      | 34                                                    | 91.9                   |
| 1955 | 41            | 5                      | 36                                                    | 87.8                   |
| 56   | 40            | 3                      | 37                                                    | 92.5                   |
| 57   | 48            | 2                      | 46                                                    | 95.8                   |
| 58   | 60            | 4                      | 56                                                    | 93.3                   |
| 59   | 60            | 8                      | 52                                                    | 86.7                   |
| 1960 | 59            | 3                      | 56                                                    | 94.9                   |
| 61   | 58            | 7                      | 54                                                    | 93.1                   |
| 62   | 58            | -                      | 58                                                    | 100.0                  |
| 63   | 63            | -                      | 63                                                    | 100.0                  |
| 64   | 34            | -                      | 34                                                    | 100.0                  |
| 1965 | -             | -                      | -                                                     | -                      |
| 66   | 38            | -                      | 38                                                    | 100.0                  |
| 67   | 39            | 6                      | 33                                                    | 84.6                   |
| 68   | 54            | 2                      | 52                                                    | 96.3                   |
| 69   | 60            | 3                      | 57                                                    | 95.0                   |
| 1970 | 85            | 1                      | 84                                                    | 98.8                   |
| 71   | 82            | 1                      | 81                                                    | 98.8                   |
| 72   | 80            | 1                      | 79                                                    | 98.8                   |
| 73   | 38            | -                      | 38                                                    | 100.0                  |

Source: Nippon Steel Corporation, Kamaishi Kyōshūsho, ed. (1975), 80-81, and foldout table.  
Note: The 17th class of students (enrolling in FY1962) and the 18th class of students (enrolling in FY 1963, high school graduates) graduated in November 1963 via early graduation.

accepted 50 graduates of two-year higher courses at national schools (kokumin gakkō). Students initially received a daily stipend of 3.30 yen, an amount that rose to over 10 yen and eventually 50 yen as inflation drove prices up. Table 3 shows the Plant-Worker School’s graduate counts. In terms of curricular distribution, formal learning (756 hours) took precedence over on-site training (504 hours) in the institution’s first year in operation. However, the numbers of hours in the two categories both increased and balanced out by the time the school’s fifth class enrolled in FY1950: students were expected to complete 1,055 hours of formal learning and 1,008 hours of on-site training. Students in those first
The new, two-year Development Center program had students complete classroom instruction in year one and then progress on to their second year of study, which put them in branch classrooms on worksite premises for classes in forming, iron making, power, and machining (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 45–51). Whereas the Plant-Worker School had been akin to a private academy, the Development Center was a bona-fide, authorized school in the “vocational schools” category under the School Education Act (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 51).

Students at the Development Center received monthly scholarships of 3,000 yen, and the ratio of applicants to available enrollment slots at the institution approached 10:1. In 1952, Development Center teachers conducted a study of the operations at Wanishi Private Technical School and also toured the in-house education facilities at Nippon Kōkan (NKK) and Hitachi, Ltd. The first nine cohorts of students produced 367 graduates (see Table 3), many of whom found positions in Machining (58 graduates) or Electric Power (31). The next most-common destinations were Steel-Making, Iron-Making, and Rolling 1 (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 52, 55). The Development Center remained popular into the mid-1950s; according to the organization’s official history, “Earning admission to the Development Center was no easy task, as a successful applicant would have had to outperform anywhere from seven to ten other hopefuls just to get in, on average. Middle schools would measure themselves on how many of their students had gone on to enroll at the Development Center in a given year; those sending higher numbers of graduates made that success a point of pride” (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 58). That reputation persisted for a considerable stretch.

3. The reorganization of the Development Center

Between the mid-1950s and the mid-1960s, however, rising percentages of middle school graduates opting for the high-school track presented the Kamaishi Works with the question of whether it was still worthwhile to educate middle school graduates at the Development Center. Decision makers came to several grim findings in 1962, noting “dwindling numbers of applicants due to the growing proportion of students electing to go on to high school,” “growing numbers of fields involving intellectual, white-collar work (rising standards for fundamental knowledge),” “the lack of a need to train middle school graduates into engineers due to increasing numbers of recruits from the pool of high school graduates,” and “the fading appeal of the system itself (with the majority of graduates progressing on to part-time education).” Concluding that the Development Center no longer served its original purpose due to the numbers of Development Center students pursuing part-time education after graduation and the company’s shift toward
hiring more workers with high school degrees, the executives decided to begin admitting high school graduates in FY1963 (corresponding to the institution’s 18th cohort of enrollees). The new framework was a one-year, full-time (full-day) curriculum for high school graduates with a single track, eliminating the distinctions between the general course, technical course, and commercial course, in order to create a stream of workers to fill middle-ranking positions in the future (Nippon Steel Corporation, Kamaishi Kyōshūsho ed., 59–60).

The one-year curriculum comprised several elements: basic technical training (safety, slinging [crane operation], machinery, electricity, etc.), basic subjects (mathematics, physics, chemistry, engineering English, social studies, art, and liberal arts), related subjects (iron-making methods, machinery, and electricity), and applied technical training, among others. The applied technical training portion had four separate courses (machinery, electricity, chemistry, and metallurgy), each providing instruction in the corresponding applied skills, and each student would follow the course for the job group he would be assigned to after completing his studies. Each course also featured a specialized education department and an administrative department, which covered quality management, work improvements, and cost management. In addition, the institution required all students to live in a dormitory for the full year in hopes of bringing students from different academic backgrounds—general courses and industrial courses, for example—together (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 61). The school history notes that the enrollees in FY1963, born in 1945, “wore navy suits to the entrance ceremony, a symbolic reminder that the times had indeed changed” (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 61).

However, the late 1950s and early 1960s were tumultuous times for both the Kamaishi Works and Fuji Iron & Steel in general. The 17th class of students (63 middle school graduates enrolling in 1962) and 18th cohort (34 students, the first group with high school degrees, enrolling in 1963) both graduated in November 1963—and 75 of the 97 total graduates went straight to work at Tokai Steel, a subsidiary of Fuji Iron & Steel. Around the time of their graduation, Fuji Iron & Steel was busy sending 758 transferees from the Kamaishi Works to Tokai Steel en masse, an enormous reshuffling with an impact that evidently stretched all the way to the Development Center. The 22 graduates who remained at the Kamaishi Works continued to undergo supplementary education until March 1964 (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 62–63).

3 According to Kurata Tomonori, “The school assigned two roommates to each dormitory room, opting for arrangements that would pair students from different areas and hometowns, students who had graduated from different courses (general courses and industrial courses), and students with different club affiliations” (Kurata Tomonori, “Seichō shita sugata ni kangaî” [The moving experience of seeing the students grow], in Nippon Steel Corporation, Kamaishi Kyōshūsho ed. 1975, 8). Evidently, one of the school’s goals in mandating dormitory residence was to bridge gaps between students from different backgrounds.

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The Kamaishi Works suspended admissions to the Development Center in FY1964 only to resume recruitment one year later under a significantly different curriculum. The one-year program comprised a total of 1,764 hours of study, covering basic education (social studies and mathematics; 11% of the total), specialized education (metallurgy, machinery, electricity, measurement, quality control, drawing, and safety; 24%), physical education (10%), art (music; 10%), and practical skills (basic and specialized; 54%). Over the course of the year, students spent 109 days in class and 136 days in training. Group training commenced in January, with students breaking into four squads—finishing, welding, electricity, and cranes—for hands-on training (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 64).

High school graduates continued to make their way through the Development Center’s one-year program until FY1972, when officials again began to debate the merits of the institution. The procedures at other works had various approaches to education: the Muroran Works, for example, still put middle school graduates through a three-year training program, while the Hirohata and Nagoya Works had high school graduates complete a two-week group program and then move on to between six and nine months of technical education. However, leaders at the Kamaishi Works came up with a concrete proposal contending that it would be more effective to condense the existing one-year education program into a six-month setup and have incoming workers head right into OJT for their specific work roles after completing their education. The labor union countered, arguing in favor of keeping the Development Center in operation, but the establishment’s run came to an end with its 27th cohort (students enrolling in FY1972). The institution held its last graduation ceremony on March 22, 1973, bringing its total graduate count to 1,327 (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 76–78, and foldout table).

From the mid-1960s onward, there was a major shift in the geographical distribution of the birthplaces of students at the Development Center. Kamaishi natives had accounted for upwards of 80% of the enrollment through 1966, but that percentage dipped to between 60% and 70% over the next four years, sank to 42% in 1971, and then dropped to 37% in 1972 (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 77). Despite its reforms in FY1965, which involved overhauling operations to admit high school graduates and switching to a one-year curriculum, the Development Center saw its standing in the local community change dramatically. That lack of a strong local grip was another important factor contributing to the institution’s closing in 1973.

As of May 1974, the Technician Training Institute (588 graduates, 279 of whom had left their positions by May 1974) and the Development Center (1,327 graduates, 108 of whom had left their positions) combined for a total of 1,510 graduates on the current roster at Nippon Steel Corporation. Those 1,510 employees worked at several different locations: 973 at the Kamaishi Works, 463 at the Nagoya Works, 48 at the Kimitsu Works, 9 at the Ōita Works, 7 at the Hirohata Works, 5 at the Product Technology Institute, 2 at the Osaka Sales Office, 2 in the Machinery Division, and 1 at the Work Head Office (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., foldout table). The work assignments in May 1974 for 337 middle school graduates who had completed the
Development Center curriculum and graduated by 1962, meanwhile, were the Work Section (46 graduates), Maintenance Section (35), Equipment Technology Section (30), Wire Rod Plant (25), and Large Steel Product Plant (23) (Nippon Steel Corporation, Kamaishi Kyōshūsho, ed., 76–78, and foldout table).

IV. Hirohata Works
The Hirohata Works opened a Technician Training Institute in April 1940 to comply with the Order to Establish Technician-Training Programs at Factories and Workshops. The Works also created a complementary School for Youths the following April, but both institutions closed in August 1946. In the aftermath of the war, the Human Resources Section in the Works’ Labor Department handled education for TWI (Training within Industry) trainers, trained MTP (Management Training Program) instructors, and offered introductory education for administrative and technical workers. When the Works later ramped up production, however, the need for skilled workers grew. The Hirohata Works thus began planning a new educational framework and, after around two years of preparations, opened the Labor Department Development Center in April 1956 (Hirohata Works, 30th Anniversary Project Committee, ed. 1970, 686).

In addition to offering standard training, the Development Center at the Hirohata Works also offered a three-year training program for middle school graduates. On a yearly average, the establishment sent roughly 60 newly minted apprentices to various worksites from 1959 to 1964. The falling numbers of middle school graduates joining the workforce, however, made it increasingly difficult for the Development Center to fill its enrollment capacity—and rapid equipment rationalization made it a challenge to project personnel needs in the long term. Considering the uncertainty of the context, the Works decided to stop accepting middle school graduates after admissions for FY1961 and then ultimately closed the Development Center in October 1962. To compensate for the training needs that would remain after the Center’s closure, the Works began providing high school graduates in the maintenance division with extended introductory education (skilled trainee education) in April that same year (Hirohata Works, 686–687).

V. Technical education for middle and high school graduates at other companies
1. Shibaura Machine Works
A spinoff of Shibaura Machine Tool’s various plants in 1949 under the Enterprise Reorganization Act resulted in the Numazu Plant becoming a new entity called “Shibaura Machine Works,” which established the Shibaura Machine Works Vocational Training Center in 1953. Admitting middle school graduates, the Vocational Training Center (which would be subject to the Vocational Training Act from 1958 onward) had a three-year period of study and programs in eight areas: casting, wood molding, plating, electrical welding, machinery, machine assembly, machine painting, and electrical-
machinery assembly. The only programs that admitted students on a yearly basis were machinery, machine assembly, and casting, which were in sufficient demand to warrant annual admissions; the other five programs were less popular and therefore enrolled students once every few years. As of 1959, the institution had 14 first-year students, 15 second-year students, and 19 third-year students for a total of 48 students (Miyachi, Saitō, and Matsuzaki 1960, 56–57).

The ratio of applicants to enrollment slots at Shibaura Machine Works Vocational Training Center generally hovered between 2:1 and 3:1, but those ostensibly low rates actually stemmed from the fact that students could only apply with recommendations from their middle schools—a process that winnowed the applicant pool, meaning that the actual competition for admission was likely stiffer. Successful applicants were selected by job type, and enrollees were immediately affiliated with their destination (department or section) at a plant instead of being formally assigned to the Vocational Training Center. While the Vocational Training Center oversaw the trainees’ classroom studies, the responsibility for tending to the trainees’ day-to-day life at the company and providing skill-oriented training fell to the respective worksite advisors. The Vocational Training Center also drew on the help of the nearby Numazu Technical High School for educational assistance. Through an arrangement between the two institutions, Numazu Technical High School’s part-time program would cover a portion of the Vocational Training Center’s educational offerings, while the Vocational Training Center would reciprocate by allowing students from Shibaura Machine Works in Numazu Technical High School’s part-time program earn credits in certain subjects. All the trainees became students in the part-time program’s machinery course and headed to the high school after work at the plant, with high school-aged members attending three days a week and fourth-year trainees sitting for classes a full six days a week. The arrangement between the two institutions also had implications on the teaching side, of course: the Vocational Training Center employed 27 “internal instructors” and 5 “external instructors,” the latter being teachers at Numazu Technical High School. The high school teachers used high school textbooks to instruct the classes for credit (Miyachi, Saitō, and Matsuzaki, 57–59).

In 1957, four years after its opening, the Shibaura Machine Works Vocational Training Center moved to have all of its students attend high school. Shibaura Machine Works already had a well-educated workforce relative to its competitors; as of 1959, 12.5% of its employees held university or technical college degrees, while 35% had a middle school diploma (under the old educational system) or high school diploma (under the new system). The decision to send every Vocational Training Center trainee to high school was part of the company’s aims for an even higher standard of education, an aim to ensure that every employee—even those on the ground at worksites—was a high school graduate. Although that may have required graduates of the Vocational Training Center’s three-year program to complete one additional year of part-time education, Shibaura Machine Works compensated by paying employees who had finished their vocational training the same wages as employees who had graduated from high school under the standard terms. The company did not base employment assignments strictly on
educational background. Some of its technicians in 1959 had graduated from schools for working youths under the old system, while 30% of its employees with high school diplomas worked in the field. Being a high school graduate did not necessarily guarantee an employee an engineering-type job, nor did the Vocational Training Center automatically funnel graduates into the skilled-labor pool. For the management at Shibaura Machine Works, paving the way for Vocational Training Center graduates to secure engineering-oriented positions was a future issue to address (Miyachi, Saitō, and Matsuzaki, 59).

Lacking its own education plant, the Vocational Training Center had its students get practical instruction at their respective worksites. The instructors in charge of the relevant subjects were engineers with university or technical college degrees, while the employees who handled the hands-on practical training were squad leaders who had worked themselves up the ranks. Skill-oriented education had three parts—basic training, applied training, and off-site training (which sent trainees to plants besides their own assignments)—but the track was not entirely a stepwise procedure. After learning the basics in September, October, and November of year one, trainees then did applied training and off-site training simultaneously (Miyachi, Saitō, and Matsuzaki, 60).

The issue of “dual schooling,” or systems that required both work at in-house training facilities and attendance in part-time high school classes, eventually rose to the fore and prompted a legislative response. Substantial pressure from economic circles compelled lawmakers to make partial amendments to the School Education Act in October 1961, which allowed portions of studies at in-house training facilities to count toward credits at part-time or distance-learning high schools (revisions that some called the “Collaborative Education Act”). The new provisions stipulated that (1) the amount of work at an in-house training facility recognized as high school credit could not exceed one-third of the total credits required for graduation and (2) only work in special subjects would be eligible for credit recognition. Upset at the limitations, the Japan Federation of Employers’ Associations argued that the reciprocal arrangement would have a minimal effect unless the law made it possible for students to transfer more credits. The assertion appeared to have merit, as reciprocal arrangements indeed soon collapsed under the restrictions. That was the case for the pilot program linking Shibaura Machine Works and Numazu Technical High School, for example, just as it was for the affiliation between the NKK Tsurumi Works and a separate, full-time course at Tsurumi Municipal Technical High School. As of March 1965, only a scant handful of schools still had reciprocal credit arrangements with training facilities. Instead of pursuing their studies through collaborative education, groups of students at in-house training facilities began taking classes via correspondence courses (Sasaki 1966, 31–32). Also indicative of that shift toward correspondence courses was the above example of Fuji Iron & Steel Muroran Technical High School, which introduced correspondence courses in FY1964.
2. Mitsubishi Electric

According to the standards governing apprentice education for middle school graduates at Mitsubishi Electric in 1958, trainees were to spend six days a week on practical and academic instruction: three days of each in year one, four days of practical work and two days of academic work in year two, and then five days of practical work and one day of academic work in year three. The academic component comprised a three-year total of 1,680 class hours, or 840, 560, and 280 hours in years one, two, and three, respectively (Kume 1958, 10). The practical-training component had a prescribed procedure, as well. In the first term of the first year, students would do “Basic Training I” at an education plant, focusing mostly on basic training and precision training. They would then progress on to either the “machinery” track or “finishing” track, spend the second term of the year doing applied training, circuit training, and supplementary training as part of “Basic Training II,” and finally receive provisional assignments. Year two consisted of “Specialized Training I,” which required a participant to spend time in each squad at a given plant. Trainees got their scheduled assignments after completing year two, after which they embarked on “Specialized Training II”—learning exclusively in the squad they were scheduled to be assigned to—in year three. Upon completing the entire process, trainees officially started their assignments. The company enlisted teams of trainers to handle the instruction at the education plant: one head trainer and two assistants for every twenty apprentices (Kume 1958, 9–11, Miyachi, Saitō, and Matsuzaki 1960, 58, 60–61).

The Mitsubishi Electric Itami Works trained technicians via an apprentice-education system after the abolishment of schools for working youths in March 1948. The competition to become an Itami Works apprentice was apparently heated. In 1952, 50 applicants vied for just two open apprentice slots in Kochi Prefecture. The initial screening process whittled the pool down to 10 finalists, from whom the Works selected the lucky duo via subsequent deliberation (Idenshi Editorial Committee, ed. 1981, 59–60).

In 1960, the “apprentice system” became the “technical trainee system” in accordance with the Vocational Training Act. As the Itami Works started to expand its recruiting efforts, it also operated a three-year instructional training program for middle school graduates (for “students in training,” separate from its technical trainee system) with a focus on practical-skill and on-site production training from 1962 to 1970; the program suspended new admissions in 1966 and graduated its last cohort in March 1973. Another new venture was an intensive, one-year “accelerated apprentice” training program for graduates of public vocational training institutes (Idenshi Editorial Committee, ed. 1981, 72). Mitsubishi Electric explained its outlook on organization-wide educational policies on technical trainees: “Our educational goal is to train skilled, versatile technicians in our image of the ideal mold for the future. Education for technical trainees, therefore, transcends simply providing technicians with functional instruction. In order to cultivate leaders for future generations, we must expand our perspective and invest in the training of good employees and upright citizens. It is for this reason that we emphasize a broader, nurturing mode of education, recognizing that the need to educate
employees as citizens with sound human and cultural literacy is of no less importance than the need to give employees the practical skills requisite to job performance” (Kume 1964, 170). At Mitsubishi Electric, therefore, middle school graduates were not lumped all together in the same category. The two tracks—one for “students in training” and the other for “accelerated apprentices”—followed different paths, indeed, but the basic vision delineating that passage was the same. Mitsubishi Electric saw its technical trainees as potential leaders for the future and thus strove to help them gain versatile skillsets with a firm grounding in human and cultural literacy.

The Itami Works hired its first high school graduates to work in field in 1963. At first, the establishment would put its new employees through “education” (little more than basic orientation) and then leave the rest of the training to OJT. In 1965, however, the process took on a more systematic quality. The Works set up a basic technical course for high school graduates in 1965 and augmented the instructional framework with technical trainee education (a one-year program) in 1968. From 1967 onward, the Works found itself recruiting more high school graduates than middle school graduates (Idenshi Editorial Committee, ed. 1981, 60, 72)—a consequence of the shrinking pool of middle school graduates seeking employment in the late 1960s. A notification from the Ministry of Labour in 1968 suggested that the Works make the switch from filling its technician positions with middle school graduates to hiring only high school graduates, and Mitsubishi Electric responded by halting the recruitment of middle school graduates at its production facilities in Kobe, Nagasaki, and Nagoya. The technical trainee system at the Itami Works remained in place, however (Idenshi Editorial Committee, ed. 1981, 60).

3. Fuji Electric

Fuji Electric hired graduates from universities and colleges of technology to work at its head office and people with high school or middle school diplomas to work at its various plants. Discussing skilled employees, a member of the company explained the context of the recruiting process. “We used to hire middle school graduates to fill most of our skilled positions, but we started recruiting what we call ‘high school–graduate field workers’ in the mid-1950s due to a general, society-wide lack of labor resources coming out of middle schools and the fact that the company was looking for human resources capable of better adapting to technical innovations,” he said. “The percentages of high school–graduate field workers have continued to go up ever since; in fact, around 90% of our regular recruits this fiscal year [author’s note: FY1968] were high school graduates. As a result, we now need to make drastic changes to our educational framework for new skilled employees and replace the existing three-year training program for middle school graduates with something more optimal” (Ishibashi 1968, 21).

The new skill-training system for incoming skilled workers with high school diplomas at Fuji Electric, or “specialized worker education,” provided instruction over either the first six months or the first year of a new employee’s career. During that introductory education period, specialized workers (mostly technical high school graduates but also some products of general courses at high schools) would receive a
salary in the form of an educational allowance as part of the plant’s work-role organization. For the company, the goal was to ensure that the workers had gained the skills equivalent to level-2 technical proficiency under the in-house standards by the time they had completed all three terms of their practical-skill training program. “At first, we were unsure that the specialized worker education system would be enough to bring learners up to the same level as middle school graduates who had gone through a full three years of training,” one Fuji Electric manager recalled. “From what we see in the test results, though, our concerns appear to have been unfounded” (Ishibashi 1968, 21–22).

The specialized worker education in place at the Kawasaki Plant in FY1968 provides an example of how Fuji Electric designed its three-term training process. After the first term of “standard basic training” in practical skills (2 months/68 hours at the training plant and forge plant), new recruits went into “basic and applied training by job type” (approximately 4 months/530 hours at the training plant and manufacturing plant) in the second term and finished with “specialized training by plant” (6 months/1,070 hours at the manufacturing plant, where they “took on provisional plant assignments and gained specialized skills through direct work experience”) in the third term (Ishibashi 1968, 28).

4. Ikegai Ironworks
Looking at the educational offerings for new employees at Ikegai Ironworks in 1968, one finds that since 1958, all new field employees—except for those in the founding division—were graduates of either the company’s in-house vocational training institute or technical high schools. If necessary, the company would also conduct mid-career recruitment (hiring workers up to age 35) to fill positions (Uno 1968, 51).

The founding division was the only segment for which Ikegai Ironworks hired middle school graduates, but its reasoning for doing so was simply that it was such a challenge to find technical high school graduates to do founding work. “‘Production as usual’ was evolving into a more modern framework, and founding was significantly inferior to engineering in terms of labor conditions,” Uno Matsuji explained. The company was hoping to break away from that environment (Uno 1968, 55–56). For younger mid-career recruits, the company also complemented OJT with group education to help boost motivation.

Graduates of technical high schools, training institutes, and general courses at the high school level alike went through five months of group education, two months of work in provisional assignments, and late-stage training for field workers at the company’s Technical Training Center before assuming their official plant assignments. That educational structure for new employees took shape when the company decided in 1967 to consolidate the individual, existing educational frameworks in place at the machine-production plants (the Shinmei Plant, Mizonokuchi Plant, and Industrial

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4 In October 1968, the company stopped using the term “plant workers” in favor of “field workers.”

5 This description is based on Uno 1968, 56–59.
Machinery Plant) under head-office control, create a facility on the Mizonokuchi Plant premises for roughly 60 employees to undergo classroom- and practice-based group education, and have all new field workers in the machine-production division attend the Technical Training Center immediately after entering the company. “It was obvious that we would soon be recruiting technical high school graduates or people with similar backgrounds to fill most of our field-worker positions,” one Ikegai Ironworks official said. The company thus implemented introductory education for specialized skills to ensure that “these employees [coming out of technical high schools, etc.] would establish a solid grounding in their jobs and also motivate them to take responsibility for and pride in what they would be doing.”

For the first five-month term at the Technical Training Center, the company divided the technical high school graduates (and those with similar backgrounds) and in-house training-institute graduates into two separate groups. The two groups then split their days doing classroom work and practical training on an alternating basis: one group would do classroom work in the morning and practical training in the afternoon, while the other group would do the opposite. The second term at the Technical Training Center, a two-month program, sent trainees into the field for on-site practice at their provisional assignments and also involved once-a-week classes at the Center. The company employees with the biggest impact on the trainees over the course of the five-month group-training program were the skill trainers, who were middle-ranking field workers with recommendations from plant leaders and promising prospects to become eventual squad leaders. The trainers helped the workers enhance their skills by following an official protocol, which allowed both groups of trainees to progress at roughly the same speed.

VI. Conclusion
The chief factors that transformed in-house training for new middle school graduates at major firms were technological innovation and an increase in the proportions of students electing to attend high school. At Fuji Iron & Steel’s Muroran Works in Muroran, Hokkaido, where the rises in high-school matriculation rates lagged behind those on Japan’s main island, training and education for middle school graduates continued into the 1960s. Changes were in motion, however. In FY1961, Wanishi Private Technical School became Fuji Iron & Steel Muroran Technical High School and extended the course of study from two years to three years. The school also introduced correspondence courses three years later, in FY1964. The series of changes effectively reshaped institution’s function, allowing students at Fuji Iron & Steel Muroran Technical High School to obtain high school–graduate qualifications without having to attend extra school part-time. At Fuji Iron & Steel’s Kamaishi Works, meanwhile, the Development Center went from admitting middle school graduates to enrolling high school graduates and shifted from a two-year program to a one-year program in FY1963. The company’s Hirohata Works saw an even more drastic swing as circumstances changed. After creating
a Development Center in 1956 to provide new middle school graduates with a three-year educational program for skilled workers, the Works ultimately closed the institution in October 1962—just six years later—as the growing numbers of high school–graduate field workers rendered dedicated education for middle school graduates superfluous.

The Muroran Works had long stood by its focus on training and education for new middle school graduates, but even that commitment gave way to change. In FY1970, Fuji Iron & Steel Muroran Technical High School officially became Nippon Steel Corporation Technical High School. Under that new name, the institution divided its students into the machinery and electricity departments to help facilitate the training of human resources for use in the maintenance division, cut the number of class hours in the general course down to the minimum level for correspondence courses, and offset that reduction by increasing the number of hours students spent on practical training. However, a major slump in the iron and steel industry in the early 1970s made it impossible for the school to remain in viable operation. The institution eventually shut its doors in March 1973. The Development Center at the Kamaishi Works, a one-year program for high school graduates, also shut down operations around the same time as the school in Muroran despite objections from the labor union.

At Mitsubishi Electric, meanwhile, the focus centered on giving employees what they would need to succeed as future worksite leaders. Educational offerings for technical trainees thus operated around the objective of cultivating versatile, multi-skilled workers with a broad foundation in human, cultural literacy, a reflection of the company’s convictions that cultural refinement—even in vocational training—would foster long-term benefits. Despite that determined vision, not even Mitsubishi Electric could keep its training regimen intact as the times changed. The company’s sites in Kobe, Nagasaki, and Nagoya all stopped recruiting middle school graduates in 1968, and the Itami Works instituted a one-year technical training system for high school graduates to operate alongside its existing three-year framework for technical trainees that same year.

Although the companies and worksites in this paper had their own distinctive traits, their training and education frameworks all swung from long-term programs for middle school graduates to one-year (or shorter) programs for field workers with high school diplomas in the late 1960s and into the early 1970s.

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References

Hirohata Works 30th Anniversary Project Committee, ed. Hirohata Seitetsusho 30 nen-shi [A 30-year history of Hirohata Works]. Hirohata: Hirohata Works, 1970.

Idenshi Editorial Committee, ed. Mitsubishi Denki Itami Seisakusho 40 nen no ayumi [A 40-year history of the Mitsubishi Electric Itami Works]. Itami: Mitsubishi Electric Itami Works, 1981.
Ishibashi, Tetsunosuke. “Fuji Denki ni okeru shinnyū shain kyōiku” [Education for beginning employees at Fuji Electric]. In Shinnyū shain kyōiku no mondaiten to jitsureishū [Problems in and examples of education for beginning employees], edited by Rōmu Kanri Kenkyūkai, 17–31. Tokyo: Idem, 1968.

Kennedy, Sean, Robert Drago, Judith Sloan, and Mark Wooden. “The effect of trade unions on the provision of training: Australian evidence.” British Journal of Industrial Relations 32, no. 4 (December 1994): 565–580.

Kume, Masaru. “Kigyōnai kyōiku kunren no ippan-tekki dōkō to tōsha ni okeru kyōiku jisshi no gaiyō” [General trends in in-house education and training and an outline of educational exercises at our company]. Seisan to Denki 10, no. 10 (October 1958): 5–13.

Kume, Masaru. “Mitsubishi denki no shinnyū shain kyōiku” [Education for beginning employees at Mitsubishi Electric]. In Shinnyū shain kyōiku no jissai [Practices of education for beginning employees], edited by Rōdō Hōrei Kyōkai, 155–186. Tokyo: Rōdō Hōrei Kyōkai, 1964.

Kupets, Olga. “Employer-provided training, innovation and skills in post-Soviet countries.” Economics of Transition 26, no. 4 (2018): 725–768.

Miyachi, Seiya, Saitō Kenjirō, and Matsuzaki Iwao. “Ruporutā: Kigyo-nai kyōiku” [Report: In-house education]. Kyōiku 10, no. 2 (February 1960): 55–61.

Nippon Steel Corporation, Kamaishi Kyōshūsho, ed. 46 nen no ayumi [Our 46-year history]. Kamaishi: Nippon Steel Corporation, Kamaishi Kyōshūsho, 1975.

Nippon Steel Corporation. Muroran Technical High School, School History Editorial Committee ed., Gakkō-shi [School history]. Muroran: Nippon Steel Corporation, Muroran Technical High School, 1975.

Roundtable discussion. “Kōsotsu gengyōin jidai” [The age of high school graduates as field workers]. Rōdō Jihō 21, no. 7 (July 1968): 7–14.

Sasaki, Susumu. “Shokugyō kunren no saikin no dōkō” [Recent conditions in vocational training]. Kyōiku Hyōron, no. 181 (February 1966): 31–34.

Ueshima, Yasuhiro. “High economic growth and human capital: Conditions for sustained growth.” Japan Labor Review 11, no. 3 (Summer 2014): 5–34.

Uno, Matsuji. “Ikegai Tekkō ni okeru shinnyū shain kyōiku” [Education for beginning employees at Ikegai Ironworks]. In Shinnyū shain kyōiku no mondaiiten to jitsureishū [Problems in and examples of education for beginning employees], edited by Rōmu Kanri Kenkyūkai, 51–60. Tokyo: Rōdō Hörei Kyōkai, 1968.

Wanishi Private Technical School, ed. Gakkō yōran [School directory]. Muroran: Wanishi Private Technical School, 1959.