The Common Sense of Copying

Abstract

This essay provides a survey of two very significant phases in the history of Japanese education: 1) the founding of the modern system (1872-1890) with a focus on the pedagogical practices acquired from the United States during that period and 2) Japan's performance on international tests of mathematics achievement. The first relies primarily on Benjamin Duke's recently published book *The History of Modern Japanese Education: Constructing the National School System, 1872-1890*, and the second on a detailed comparison of ERA mathematics test scores of Japan and Singapore over a thirty year period. These two aspects provide clear evidence that, contrary to the assertions of some scholars, it is quite possible to transfer the practices in use in one culture to another, with great success. Noting the irony of the abandonment by the U.S. of the principles that have served Japan so well for almost 140 years, I suggest that we exercise the "Common Sense of Copying" ourselves.

The Common Sense of Copying

By Daniel M. Stamm

> Some people think that the purpose of an international comparison is to see which country is best and then get the U.S. to emulate its practices. That idea is naïve. You cannot lift something from one cultural context and expect it to work in another… (Schmidt et al, 2002, pp. 1-2)

This statement is possibly the most ironic, and erroneous, in all the literature regarding international comparisons of academic achievement. Since such tests began, Japan and Singapore have together spent a large majority of time in first place in the world in mathematics achievement as a result of very purposefully studying and adopting the educational methods of another country. Japan began doing so, primarily with the United States, almost 140 years ago. The details of this process are thoroughly described and exhaustively documented by Benjamin Duke in *The History of Modern Japanese Education: Constructing the National School System, 1872-1890* (2009). As a result it ranked first place in the world from the advent of international testing in 1964, until the TIMSS test in 1995. Singapore began studying Japan some time after it became an independent nation in 1965, and it held first place in mathematics from 1995 till 2003. Evidence for this is provided later in this article.

Two specific historical events mark the beginning of the assimilation of foreign knowledge for modernizing Japan and founding their education system. The first was the promulgation of the "Charter Oath" by emperor Meiji when he was restored to the throne in 1868. Article 5 of the Oath stated "Knowledge shall be sought throughout the world so as to strengthen the foundation of imperial rule." The second event was the opening of the Tokyo Teacher Training School in 1872. Its purpose was to train the first generation of primary school teachers who were to introduce modern teaching techniques into the new Japanese national school system (Lincicome, 1995, pp. 1-3). Both events resulted in a strong American influence on Japanese education.

The administrative structure of the Japanese system was modeled after that of the French (Duke, 2009, p. 75), but methods of instruction were to be those in use in the United States at the time. There was a trend beginning in the 1860s which fostered the acquisition of knowledge from the U.S. and facilitated its adoption. This was the importation and translation of numerous books in English which began under the influence of Yukichi Fukuzawa, a prominent intellectual, writer and founder of a private school in Tokyo which eventually became Keio University. Fukuzawa taught his students using English language texts, and collected numerous books for that purpose during three trips, one to the U.S. in 1860, one to Britain in 1862, and a second to the U.S. in 1867. His second trip to America was with a Tokugawa government mission to Washington for the purpose of finalizing the purchase of ships. On the spur of the moment, the officials also bought an enormous number of books. Duke describes the event as follows:

> A curious byproduct of the 1867 trip to America occurred when representatives of the Tokugawa government, motivated by the purchase of so many English books by

> Fukuzawa, hastily made a huge purchase of English books for the government. Unprepared for the endeavor, they hastily requested the American State Department to make the selection. The final shipment weighing ten tons included, among others, 13,000 copies of elementary readers, grammars, and math books, 2,500 copies of *Webster's Dictionary,* and 600 history books.[13] The episode illustrates how western books found their way to Japan during the feudal era through chance opportunities. (*ibid.,* p. 64)

The details of the American influence on the Tokyo Teacher Training School are equally remarkable. The explicit purpose of the school was to train the new Japanese teacher to use the materials, methods and curricula then in use in the United States, and their approach to doing so was very direct: They hired Marion Scott, an American who had taught elementary school for five years in San Francisco:

> [In] May 1872… the Ministry of Education published a formal notification of its plan to open the first training school for elementary teachers in Tokyo.[2]…[The preface of this document stated that]… one of the most urgent demands was the training of teachers for the new public elementary schools. Foreign countries, it noted, already had teacher training schools. Thus it was deemed necessary to follow their examples by hiring a foreign teacher and employing a foreign curriculum and school regulations as the model for Japan. (*ibid.,* pp. 112-113)

Among the provisions included in the document were the following:

- One translator will be employed to translate the foreign teacher's lectures.
- The lectures and curriculum will be based on foreign practices in order to develop the curriculum for the new public elementary schools.
- Ninety pupils will be chosen for an attached elementary school to be taught by the twenty-four teacher trainees using the methodology taught to them by the foreign instructor. (*ibid.,* p. 113)

The third item represents the establishment in Japan of the first university-associated national elementary school, a practice which had begun at least ten years previously in the U.S. (Dearborn, 1925, p. 38). Japan now has 73 such national elementary schools, most of which are associated with universities (Lewis & Tsuchida 1997, p. 319).

A final passage illustrates the full scope of the intention to adopt American methods and materials:

> The underlying purpose in hiring Scott was not restricted to the training of teachers in modern methodology. Ministry of Education officials had far more grandiose goals than that. They were searching for a new curriculum, new teaching materials, and new textbooks, all from California, to accompany the latest teaching techniques. (Duke 2009, p. 113)

Scott brought not only his experience in teaching school with American methods, but related textbooks, teachers' manuals and even the Rules and Regulations of the San Francisco Public Schools of California.

The central theme of this essay, the literal copying of the practices of one country by another, is amply illustrated by the following quotation. The passage also documents the establishment of the first curriculum of the Japanese national school system.

> In the process of introducing teaching methods and textbooks from San Francisco for use in the Tokyo Teacher Training School, Scott naturally followed the elementary school curriculum he employed while teaching in California. This was precisely as intended by the Ministry of Education. Since the ministry had no experience at curriculum development or time to develop one, there was no other choice but to rely completely on Scott's model classroom and materials he brought from San Francisco.
>
> During Scott's first year at the Tokyo Teacher Training School, he developed a complete model elementary school curriculum based on his courses called the Katō Shōgakkō Kyōsoku, the Elementary School Curriculum for the Lower Grades. Pressed for time, as the first national school system, the Gakusei, was scheduled to begin in April 1873, the Ministry of Education published it in September 1872. Titled simply the *Shōgakkō Kyōsoku* (Elementary School Curriculum), it included a literal translation of the San Francisco elementary school regulations.[48] The official issuance of this document marks an historical milestone that represents the first modem curriculum for Japanese elementary schools. [49]
>
> Eager to disseminate modem teaching methods in time for the new schools, the ministry also published, in May 1873, the *Shōgaku Kyōju Sho* (Elementary Teaching Methods) for national distribution. It was simply a compilation of Scott's teaching practices. The publication also included sketches of many of Scott's visual materials he used in his teacher training classroom. This provided local teachers with an opportunity not only to emulate Scott's methods in their own classrooms but also to duplicate the visual aids he employed. Combined with the *Elementary School Curriculum*, the *Elementary Teaching Methods* provided the new public schools with a national standard in what to teach with recommended textbooks mostly in translation, and how to teach it. It was all based on Scott's model classroom in Tokyo and the San Francisco school regulations. (*ibid.*, p. 126)

[48, 1] Kaigo Tokiomi, ed., *Nihon Kindai Kyōiku Shi Jiten* (Dictionary of Modern Japanese Educational History) (Tokyo: Heibonsha, 1971), 22

[49, 41] *Kyōiku Jiron* (Educational Journal) (1922), 10; Okuda Shinpō, *Kyōka Kyōiku Hyakunen Shi* (One Hundred Year History of Subject Matter Education) (Tokyo: Kenjōsha, 1985), I: 324.

Enduring Effects of the California Regulations

It is interesting to see that some of the specific methods implemented by Scott remain a fundamental part of Japanese education today. Education prior to the creation of the new national system had been conducted primarily in schools having a very small number of students, in which they were taught individually as the teacher circulated among them. Because the universal education envisioned by the reformers was to occur on such a vast scale, teaching students in large groups was the only practical mode of operation. A specific item of the California

regulations for teachers was the basis for solving this problem: "Teachers should endeavor to arouse and fix the attention of the whole class. . . . They should never proceed with the recitation without the attention of the whole class." (*ibid.*, p. 120).

Stevenson and Lee (1997) reported that today over 95% of Japanese lessons are conducted with whole-class teaching (p. 36). Students may be divided into small groups (*han*) at certain times, but "…activities of the *han* are organized by and remain under the close surveillance and guidance of the teacher." (p. 41). They explain that under whole-class instruction each child actually has *more* interaction and guidance from the teacher than from the limited amount of individualized instruction that would be possible for each student in the class. They describe a variety of methods used by teachers to maintain student interest and participation in mixed ability classrooms (the Japanese never group by ability in elementary school—p. 37).

A second feature of the modern teaching methods introduced by Scott (also part of the California regulations) was the emphasis on concrete experience—"to occupy and bring into action as many of the faculties as possible." (Duke, 2009, p. 123). This took the form of "object lessons", which were gaining widespread use in the U.S. beginning in the mid-19th century. The fundamental principle was to develop an idea using concrete objects before introducing a term for it,. The ideas could involve concepts of number, or language development related to any topic.

The Japanese still use very similar procedures in their lessons. In "How Asian Teachers Polish Their Lessons to Perfection", Stevenson and Stigler (1991) describe in detail how Japanese lessons typically involve practical examples, in which the concepts being studied are applied in familiar situations:

> Asian lessons almost always begin with a practical problem… or with a word problem written on the blackboard. Asian teachers, … give coherence to their lessons by introducing the lesson with a word problem.
>
> It is not uncommon for the Asian teacher to organize the entire lesson around the solution to this single problem. The teacher leads the children to recognize what is known and what is unknown and directs the students' attention to the critical parts of the problem. (p. 15)

In that article and another by Stigler, et al (1996), the teachers use concrete examples or models of the subject matter to help students solve problems themselves at an earlier age and with much greater understanding than is done in the West. It is highly ironic that object lessons were widely used in the U.S. but later abandoned, but are still used to great effect in Asian countries.

So, "to lift something from one cultural context and expect it to work in another" is anything but naïve. Culture matters, but it did not stop the Japanese from studying American methods and selecting a great number of them, which, along with improvements and additions from teachers through their classroom research, have become a superb pedagogical knowledge base.

Learning from Japan

Where does Singapore fit into this picture? Answers to that question come from two sources: 1) a statement of an intention to study Japanese methods and 2) the history of Singaporean performance on the IEA tests. In a chapter in *The Challenge of Eastern Asian Education*, William Cummings describes "a distinctive approach to human resource development" he terms

the "J-Model", because "*Japan was the first architect of the approach, and most of the components were fully realized in Japan circa the 1960s* [emphasis in original]." He goes on to say that Singapore and Malaysia "…announced official policies of 'learning from Japan' " (Cummings, 1997, p. 275). The feature of the J-Model of significance here he describes as follows:

> Reflecting the Eastern Asian conviction that excellence derives from a command of the basics, Eastern Asian educators placed special emphasis on the development of effective primary schools (Passin, 1965). Much care was devoted to the curriculum and teaching methods at this level.. (*ibid.*, p. 283)

Singapore became an independent nation in 1965, a year after Japan virtually tied with Israel for first place in the world in the First International Mathematics Study (FIMS). It did not participate in IEA tests until 1983-84, when it ranked 13th in the Second International Science Study (SISS), in which Japan was 2nd. Sometime during the next ten years, Singapore surpassed Japan to occupy 1st place, leaving Japan in 3rd, after Korea, in 1995. Considering only mathematics scores, Singapore remained in 1st place till 2007 when it dropped to 3rd, after Taiwan and Korea, while Japan occupied 5th place. The data for Singapore and Japan are summarized in Table 1.

Table 1 Comparison of IEA Test Scores for Japan and Singapore

Test				**Singapore**	**Japan**
Name		Year	Age or Grade	Rank(s)	
First International Math Study	FIMS	1964	13	---	1
First International Science Study	FISS	1970-71	14	---	1
Second International Math Study	SIMS	1980-81	13	---	1
Second International Science Study	SISS	1983-84	14	13	2
				Math-Sci	Math-Sci
Third International Math and Science Study	TIMSS	1995	8th	1-1	3-3
Trends in International Math and Science Study	TIMSS	1999	8th	1-2	5-4
Trends in International Math and Science Study	'I'IMSS	2003	8th	1-1	5-5
Trends in International Math and Science Study	'I'IMSS	2007	8th	3-1	5-3

Source: See Appendix for Internet links to history of IEA tests and scores.

Given the stated intention to learn from Japan and the corresponding rise in scores over a 30 year period, it certainly appears that Singapore studied the Japanese during that interval as much as the latter studied the U.S. in the 1870s. Since it was common knowledge that Japan, in modernizing beginning in 1868, had acquired systems from the West in engineering, science, law, the military, and government, as well as education, it would have seemed equally prudent to the Singaporeans in constructing their system to adopt the world-class methods of education so easily accessible to them in Japan.

Much Worth Copying

The elementary math curricula of the high achieving countries are sometimes described as focused and coherent compared with those in the U.S. because they contain only the number of topics that can reasonably be learned in the time available, and are arranged in a logical sequence. U.S. curricula, on the other hand, are often the exact opposite—they "…include almost every topic at almost every grade…" (Schmidt 2008, p. 24) and "…teachers are expected to introduce relatively advanced mathematics in the earliest grades, before students have had an opportunity to master basic concepts and computational skills." (Schmidt in Aharoni 2005, p. 11). American mathematics curricula are, simply put, fundamentally irrational. This could be due to market forces influencing textbook publishers or competition between bureaucrats with little teaching experience, but the reason is immaterial. The fact remains that we need reasonable curricula, and those of the Japanese and Singaporeans would be ideal. At this point it would be an obvious stroke of common sense for the United States to begin adopting the elementary math curricula and teaching methods of Japan or Singapore.

Japan's Course of Study (COS) would be the most straightforward to use in the U.S. because it is smaller and used for untracked classes. More advanced American students would finish it more quickly or learn the material more solidly, but at a minimum, the average student would get a sound foundation in mathematics. Singapore's elementary math curriculum is somewhat larger than the Japanese, and although they do group their students by ability, they take great pains to ensure that all students master all elements of it (Wang-Iverson et al 2009, p. 30). It still has far fewer topics than most American curricula.

Liping Ma explained in *Knowing and Teaching Elementary Mathematics* (1999) that Chinese teachers get their understanding of elementary mathematics for teaching by studying their *student* textbooks (p. 131). This is because the texts are written by experienced teachers and curriculum specialists (*ibid.*, p.131). Japanese elementary texts are also written almost exclusively by teams of teachers (Lewis et al, 2002, pp. 57). This "teacher authorship" and the fact that the books must embody the national curriculum, ensure that they are practical, content-oriented and contain no superfluous material. There are about six Japanese elementary math series, and because the publishers must all closely follow the COS, they are all very similar (Stigler et al 1996, p. 215). They are also accompanied by teachers' manuals which are strictly content-oriented, and very useful in helping teachers understand the subject matter, typical difficulties experienced by students and practical teaching methods (Lee & Zusho 2002; Whitburn 2000, pp. 116-17).

It's common knowledge that Singapore's elementary math texts have begun to be used in the U.S., even for teacher training purposes. One series of Japanese texts has been translated to date, but almost none of the teachers' materials are available in English. The remaining five Japanese series—all extremely similar, as explained above—along with their teachers' manuals, are just waiting to be translated and used for American teacher and student education. The Japanese and

Singaporean curricula and their associated textbooks have the same potential benefits for the U.S. today as those of America had for the Japanese almost a century and a half ago.

Japan and Singapore illustrate how insignificant culture is as an obstacle to the adoption of methods of one country by another and using them with equal success. Indeed, it is questionable even to apply the term “culture” to straightforward practices such as the consistent use of concrete and familiar examples, moving from simple to complex, and optimum pacing and sequencing of lessons to ensure mastery of the basics. This is especially true since they were part of American educational practices before the Japanese adopted them in the 1870s. It’s high time that policy makers in the United States swallowed their pride and began to exercise the “common sense of copying”.

. References

Aharoni, R. (2005, Fall). What I Learned in Elementary School. *American Educator*, pp. 8-13

Cummings, W.K. (1997). Human Resource Development: The J-Model.. In Cummings, W.K. & Altbach, P. G. (Eds.) *The Challenge of Eastern Asian Education: Implications for America* (pp. 171-192). Albany: State University of New York Press

Dearborn, N. H., (1925). *The Oswego Movement in American Education.* New York: Teachers College. (Reissued by AMS Press, 1972).

Duke, B. C. (2009). *The History of Modern Japanese Education: Constructing the National School System, 1872-1890*. New Brunswick, N.J.: Rutgers University Press.

Lee, S.Y., & Zusho, A. (2002). Comparing Japanese and US Teachers Manuals: Implications for Mathematics Teaching and Learning. In DeCoker, Gary (Ed.) *National Standards and School Reform in Japan and the United States.* New York: Teachers' College Press.

Lewis, C.C., Tsuchida, I., & Coleman, S. (2002). The Creation of Japanese and U.S. Elementary Science Textbooks: Different Processes, Different Outcomes. In DeCoker, Gary (Ed.) *National Standards and School Reform in Japan and the United States.* New York: Teachers' College Press.

Lewis, C. C. & Tsuchida, I. (1997). Planned Educational Change. *Journal of Education Policy*, 12(5), 313-331

Lincicome, M. E. (1995). *Principle, Praxis and the Politics of Educational Reform in Meiji Japan.* Honolulu: University of Hawaii Press

Ma, L. (1999). *Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States.* Mahwah, N.J.: Lawrence Erlbaum Associates.

Medrich, E. A. & Griffith, J. (1992). *International Mathematics and Science Assessments: What Have We Learned?*. Washington, D.C.: U.S. Department of Education, Office of Educational Research and Improvement at nces.ed.gov/pubs92/92011.pdf

Schmidt, W., Houang, R, & Cogan, L. (2002, Summer). Coherent Curriculum. *American Educator,* pp. 1-18

Stevenson, H. W. & Lee, S. Y. (1997). The East Asian Version of Whole-Class Teaching. In Cummings, W.K. & Altbach, P. G. (Eds.) *The Challenge of Eastern Asian Education: Implications for America* (pp. 33-49). Albany: State University of New York Press

Stigler, J.W., Fernandez, Clea, & Yoshida, M. (1996). Cultures of mathematics instruction in Japanese and American elementary classrooms. In T. Rohlen and G. LeTendre (Eds.), *Teaching and learning in Japan* (pp. 213-247). New York: Cambridge University Press.

Stigler, J. W., & Stevenson, H. W. (1991). How Asian teachers polish each lesson to perfection. *American Educator* (Spring), 12-20, 43-47.

Wang-Iverson, P., Meyers, P., and Lim, E. (2009, Winter). Beyond Singapore's Mathematics Textbooks: Focused and Flexible Supports for Teaching and Learning. *American Educator*, pp. 28-38

Whitburn, J. (2000). *Strength in Numbers: Learning Maths in Japan and England.* London: National Institute of Economics and Social Research.

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Appendix

IEA stands for the "International Association for the Evaluation of Educational Achievement", the real acronym for which ought to be IAEEA. IEA is actually an *abbreviation* for an *acronym*.
1.The very first IEA study, "The Pilot Twelve-Country Study", was conducted in 1959-62.
2. The second IEA study, the "First International Mathematics Study" (FIMS) occurred in 1964.
3. The third study, conducted in 1970-71 was called the "Six Subject Study" and examined reading comprehension, science, literature, French, English and civics.
4. The fourth study was the "Second International Mathematics Study" (SIMS), conducted in 1980-81.
5. The fifth study was the "Second International Science Study" (SISS), the FISS being the science part of the "Six Subject Study", carried out in 1970-71, which, as mentioned above, was the third IEA study. The SISS was carried out in 1983-84.
An examination of the "Brief History of the IEA" shows numerous other studies being conducted (addressing issues from preschool education, to literacy, and information technology in education) between 1984 and 1995, when the "Third International Mathematics Study was conducted. A new target population (9-10 year olds) was added in 1981, but the scores in mathematics for this population were not publicized till the 1995 study.

Links to IEA test history and scores on the mathematics and science tests are as follows:

International Association for the
Evaluation of Educational Achievement
Brief History of IEA
http://www.iea.nl/brief_history_of_iea.html

Medrich, E. A. & Griffith, J. (1992). *International Mathematics and Science Assessments: What have We Learned?*. Washington, D.C.: U.S. Department of Education, Office of Educational Research and Improvement
http://nces.ed.gov/pubs92/92011.pdf

TIMSS:
1995
http://timss.bc.edu/timss1995i/TIMSSPDF/P1HiLite.pdf
http://timss.bc.edu/timss1995i/TIMSSPDF/P2HiLite.pdf
1999
http://timssandpirls.bc.edu/timss1999i/pdf/T99i_Math_All.pdf
2003
http://nces.ed.gov/pubs2005/2005005.pdf
2007
http://nces.ed.gov/pubs2009/2009001.pdf

For an explanation of why Israel's achievement dropped so markedly, see Ron Aharoni (2005, Fall), What I Learned in Elementary School, *American Educator*, pp. 8-13
http://archive.aft.org/pubs-reports/american_educator/issues/fall2005/aharoni.htm
"The Role of Curriculum" by W. Schmidt appears as a sidebar in the printed edition of Aharoni's article, but not in the archived edition available online