

COMPARATIVE STUDY AMONG SWEDEN, NEW ZEALAND AND JAPAN ON EFFECTS OF NATIONAL CURRICULUMS OF EARLY CHILDHOOD EDUCATION ON RESOLVING SOCIAL DISPARITY

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Abstract

Improving early childhood education (ECE) would protect children from lives of downfall in future (Heckman). Principles, aims, and contents of ECE are written in each country's ECE national curriculum. We picked up three countries: Sweden (social disparity is quite small), New Zealand (child poverty and social disparity are serious social issues), and Japan (recently such issues have arisen). The purpose of this study is to verify the effects of characteristics of the ECE curriculum on students' academic ability and the academic gap between these three countries. We analyzed these countries' ECE national curriculum using the text-mining qualitative research method. Results suggest that Swedish ECE curriculum characteristic was round and holistic. New Zealand ECE national curriculum, although advocated to be holistic, was not round; however, the components created some independent sub-groups. Japanese ECE national curriculum was similar to that of New Zealand. We concluded that for ECE, fostering non-cognitive skills would be important; a round and holistic educational method would be effective for children's future outcomes, resolving academic gap and the social disparity brought by it.

Keywords: Early Childhood Education Curriculum, Academic Gap, Social Disparity.

1. Introduction

Early childhood education (ECE) affects children's academic ability, career, health, and sociality throughout their lifespan. Improving ECE would protect children from leading a harsh life in future (Heckman, 2013; Heckman et al., 2013). The social disparity not only creates poor and uneducated people but also makes the middle-income group and the overall society unhappy and unhealthy (Wilkinson, 2005). Low educational achievement leads to lowered economic prospects later in life. Moreover, the earlier in life is the academic gap, the more serious are the disadvantages in later life; it gets harder to overcome (Garcia and Weiss, 2017). Therefore, the first education one receives, that is early childhood education, is very important.

The purpose of this study is to verify the possible effects of the characteristics of ECE curriculum of Sweden, Japan, and New Zealand on each country's social disparity and children's academic ability after they have grown up.

2. Method

The following three countries were selected as investigation subjects: 1) Sweden with moderate social disparity, 2) Japan where recently social disparity has become observable, and 3) New Zealand with severe child poverty and social disparity issues.

We used the ECE national curriculum of the pre-revision version, not the newest version. All three countries have revised their ECE curricula in the last ten years (Sweden in 2018, New Zealand in 2017, Japan in 2018). Current academic school students or adults were educated in the pre-revision ECE curriculum when they were preschool children.

To analyze the characteristics of the ECE curricula of these three countries, we drew the Co-occurrence Network of connection and relation of words using the text-mining qualitative research method (KH-Coder ®).

To measure the social disparity, we referred to the OECD Gini coefficient data, the poverty rate of the working-age population and child poverty rate of these three countries.

For considering academic skill, we referred to the OECD's PISA (Programme for International Student Assessment) examination scores of secondary school age students of these three countries.

3. Results

3. 1 Characteristics of ECE Curricula

The derived image of the Co-occurrence Network of connection and relation of words in the ECE curricula showed the characteristics of each curriculum.

The Co-occurrence Network of Sweden ECE curriculum was round, integrative, and the words connected intimately to each other. The total page number was 16; it was compact and easy to read through. Therefore, it would be useful to understand the whole picture of ECE Co-occurrence (Figure 1).

The Co-occurrence Network of Japan was between Sweden and New Zealand. It was analytic, individual and the words connected intimately and simultaneously. Total page number was 19, which was between that of Sweden and Japan; however, it was easy to read through (Figure 2).

The Co-occurrence Network of New Zealand was analytic and individual, although it was intended to be round and holistic. Total page number was 100 and thus, it was very detailed, but not easy to read through. It might be more useful as a reference book (Figure 3).

3. 2 Social Disparity

Comparing between the OECD's poverty data (Table 1), we considered the possible effects of the ECE curriculum after reaching adulthood.

The Gini coefficient of New Zealand was the highest among the three countries, meaning inequality was highest, and that of Sweden was the lowest, meaning Swedish society was the most equal. The Gini coefficient of Japan was between that of New Zealand and Japan.

The child poverty rate also showed the same tendency. New Zealand had the highest child poverty rate, while that of Sweden's was the lowest. Japan's child poverty rate was between that of New Zealand and Sweden, respectively. Gini coefficient and child poverty rate might relate to the characteristics of the ECE curriculum. There was a small social disparity in the country which ECE curriculum was round, integrative, intimate and easy to grasp the whole picture (Sweden). The social disparity was large and serious in the country where the ECE curriculum was analytic, individual, and too hard to grasp the whole picture (New Zealand).

Relative poverty rate showed a different tendency from Gini coefficient and child poverty rate. Japanese relative poverty rate was the highest and that of Sweden was the lowest.

Sweden had the lowest social disparity indicators. New Zealand had the two highest social disparity indicators, while Japan had only one highest social disparity indicator out of three. Therefore, social disparity was the largest and most serious in New Zealand and the smallest in

Sweden. The social disparity of Japan was between that of New Zealand and Sweden, respectively, not situated in the middle but closer to New Zealand.

Table 1: Gini coefficient, relative poverty, and child poverty rate

	Gini coefficient 0: completely equal 1: completely unequal	Relative poverty rate (%)	Child poverty rate (%)
Sweden	0.278	9.2	9.1
Japan	0.339	15.7	13.9
New Zealand	0.349	10.9	14.1

Sweden, Japan: 2015, New Zealand: 2014 (OECD data)

3. 3 Academic ability

Comparing three PISA test scores (OECD's data; Figure 4 and 5), we considered the possible effects of ECE curriculum on academic ability after entering secondary schools.

Figure 1 shows the relation of reading test scores with poverty levels. In all three countries, the test score was correlated with the economic status; the poor students' score was low and the rich students' score was high. However, academic gaps, which were different between the lowest (of the poorest students) and highest (of the richest students) score, were different among the three countries. The academic gap in New Zealand was the largest and that of Japan was the smallest, while that of Sweden was between that of Japan and New Zealand, respectively. This difference between the gaps was caused by the lowest score. In New Zealand, the poorest students' score was low and the richest students' score was very high and thus, the gap was large. In Sweden, the poorest students' score was low, but the richest students' score was not too high; therefore, the gap was smaller than that of New Zealand. In Japan, the richest students' score was high, which was almost same as New Zealand; however, the poorest students' score was not as low as that of Sweden and New Zealand, respectively. Therefore, the academic gap in Japan was the smallest of the three countries. As a result of the small academic gap, Japanese students' average test score was the highest even though Swedish students scored the highest marks.

Science test score showed this relation more clearly (Figure 5). In Japan, the richest students' test score was very high; the academic gap was the smallest because even the poorest students' score was better compared with that of Sweden and New Zealand, respectively. Japanese poorest students' score was almost twice compared to that of New Zealanders and almost three times as the Swedish. As a result of the small academic gap and the high score secured by not only the richest students, but also the poorest students, Japanese students' average score was the highest.

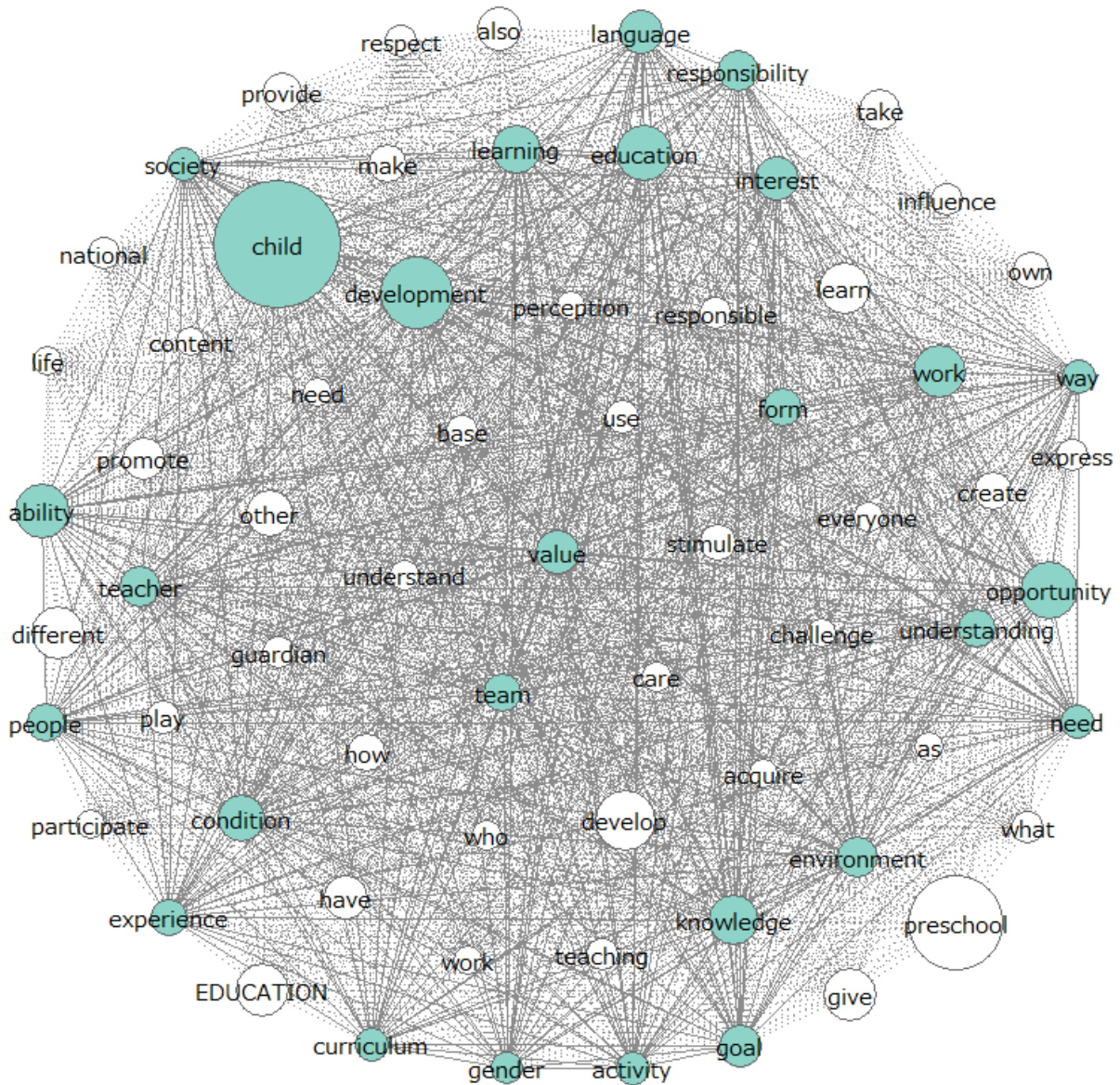


Figure 1: The characteristics of the ECE curriculum of Sweden (Co-occurrence Networks of words)

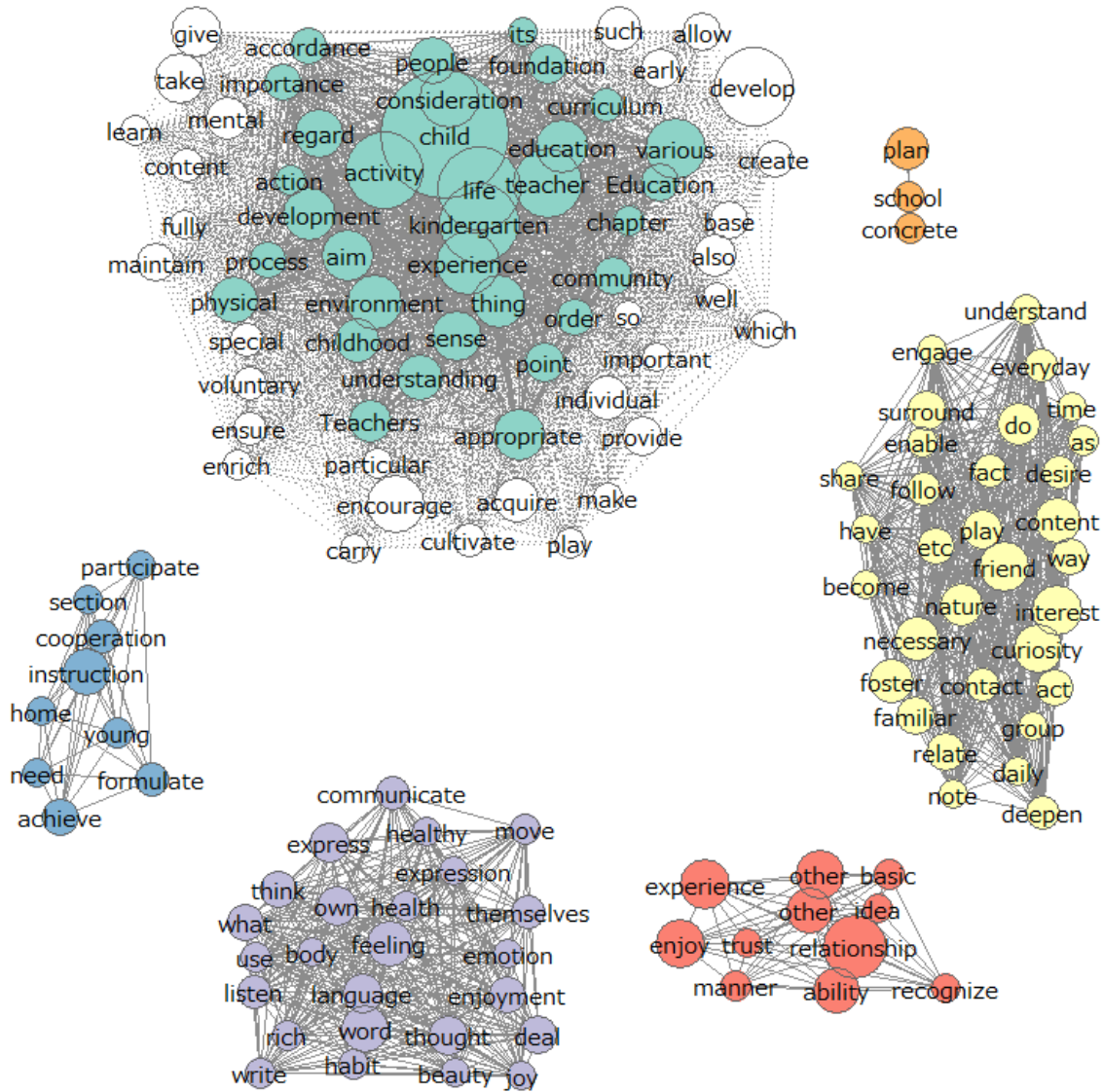


Figure 2: The characteristics of the ECE curriculum of Japan (Co-occurrence Networks of words)

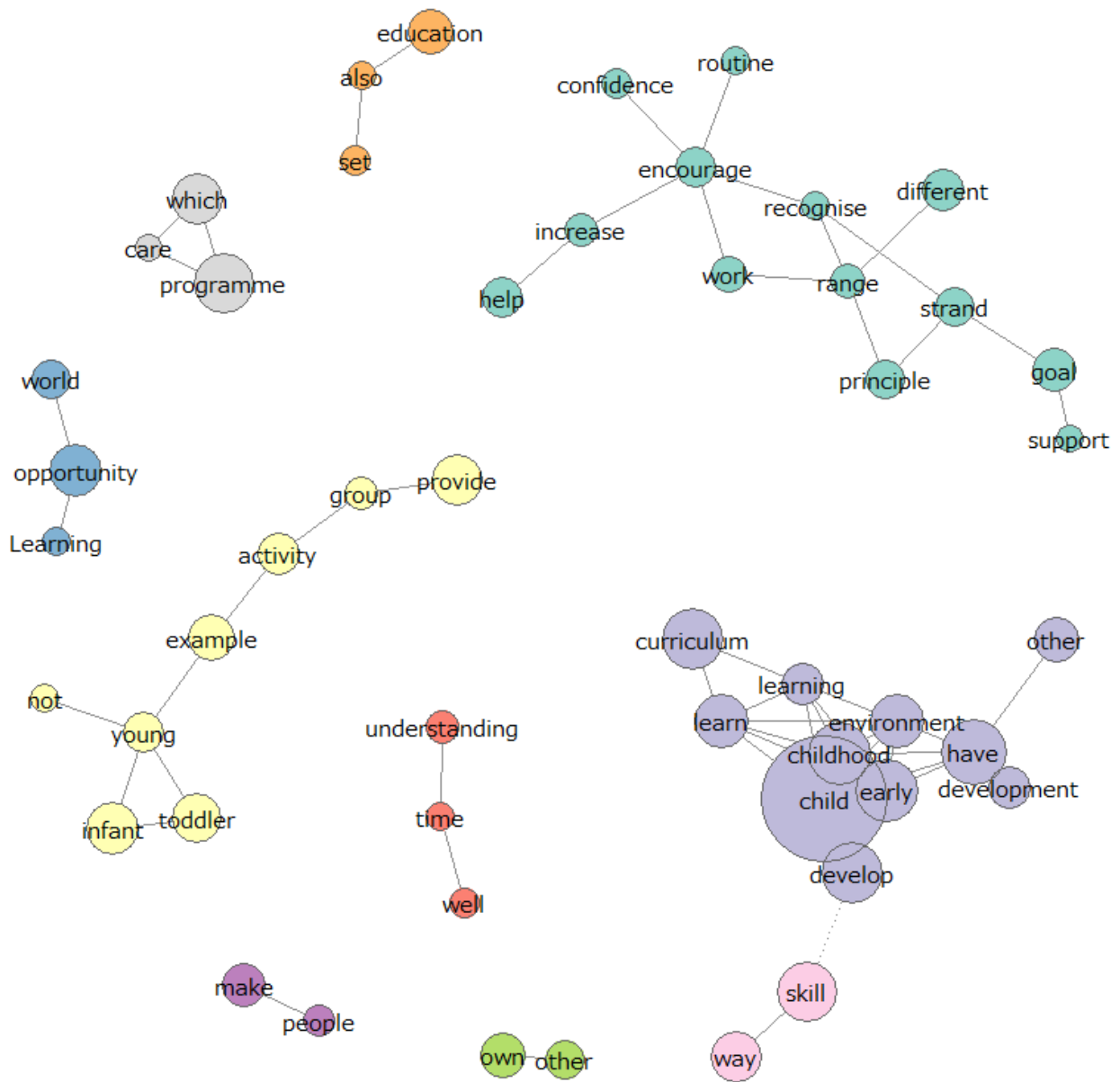


Figure 3: The characteristics of the ECE curriculum of New Zealand (Co-occurrence Networks of words)

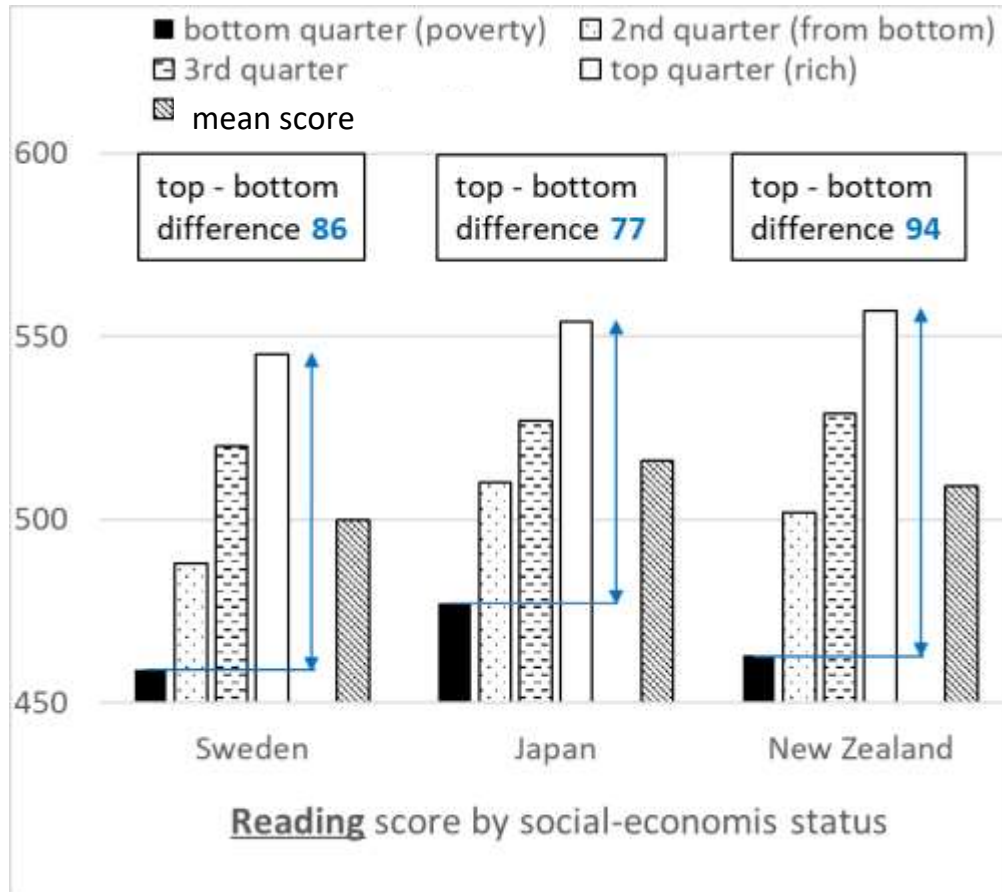


Figure 4: Reading test score of PISA by socio-economic status

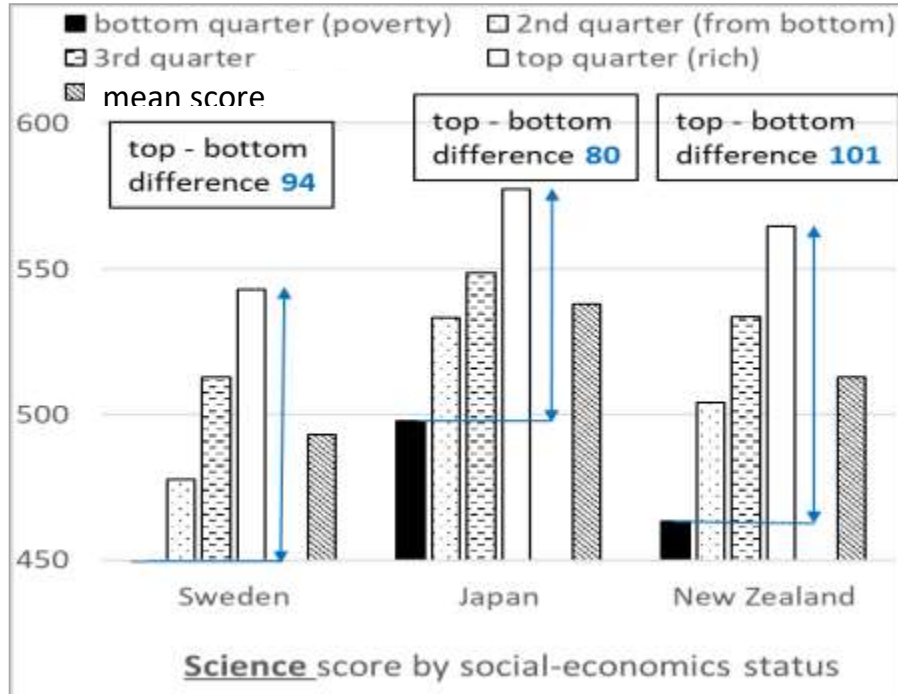


Figure 5: Science test score of PISA by socio-economic status

4. Discussion

Round and integrative ECE effects like Sweden might appear after reaching adulthood as a small social disparity (small Gini coefficient). Moderate (integrative and analytic) ECE like Japan might be related to the smallest test score gap and the highest mean score among children (PISA).

An ECE curriculum with too many pages like New Zealand's, although it intends to be round and integrative, must be analytical and individual to understand and carry out its directive. It must become selective, not holistic in limited ECE period. There might be some relationship between social disparity and ECE. A round, integrative, and "easy to grasp the whole picture" ECE curriculum might be more effective for solving social disparity than an analytic, individual and "too hard to grasp the whole picture" ECE curriculum.

It would be a relationship between economic status and academic ability; the social disparity would reflect on students' academic gap. In order to close the academic gap, raising the bottom score was effective. By raising the bottom academic score, the average academic score would also rise. Raising the top academic score much more would broaden the gap between the low-scoring groups and the average score will not rise. Maybe, raising the bottom would be effective to rising the average and close the economical gap, too.

What are the necessities of ECE? It is not taught after entering elementary school curriculum in preschools. High/Scope Preschool Curriculum Comparison Study (PCCS) (Schweinhart and Weikart, 1997) gave the answer. Children of "taught knowledge" group and children of "recommended and encouraged play freely and create games by themselves" group were followed up for twenty years. The former group's crime rate was three times as much as that of the latter group. The suspension rate of the former group was 27% and contrary to it, that of the latter group was just 0%.

Imagination, expressions, diligence, perseverance, self-control, cooperativeness, readership, planning, aspiration, and motivation are non-cognitive skills. OECD (2015) called them social-emotional skills; it reported that those skills were very important and should be fostered during childhood for a healthy and happy life in future.

Heckman told that for ECE from 0 to 5 years old children, mastering not only cognitive skills but also non-cognitive skills were very important. The cost of education for acquiring non-cognitive skills was low, but the educational effects were very large; thus, the cost-performance value ratio was very good. Contrary to that, adult education cost a lot but the effect was small; thus, the cost-performance value ratio was bad. From these results, mastering only cognitive skills would reduce the effects of ECE not only on children themselves but also on society.

Special education is not required for ECE curriculum. A round, integrated, and “easy to grasp the whole picture” curriculum would foster children’s non-cognitive skills, which would become a strong support for the children’s entire lifespan.

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