Cost – Benefit Analysis of Vocational Education
for People with Supported Employment Mental Retardation.

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I. Introduction

1. Need of this study

There is many opinion of whether the education is in the category of investment or not. T.W. Schultz and G.S. Becker reported the education effect on the workers’ quality and presented that the worker with high education background possesses more economic ability than one with lower education background. Therefore, they thought the education should be considered as investment.

In Korea, the education for mental retarded people has been importantly considered as a preparation for obtaining job since elementary school.

The purposes of the vocational course as a fundamental curriculum in Korea are following. First, they have the basic abilities of the working and the fundamental life which are needed for the work activity. Second, they accomplish the assigned work as developing the knowledge and the working ability. Third, they get the good personal relationships, the proper understandings of jobs, and the basic knowledge of works by gaining the attitudes of mutual cooperation in work places.

The Korea government has tried to improve educational environment such as enhancement of vocational education as well as employment for disabled people. These efforts include career orientation, curriculum development for vocational education, modern facilities for vocational education, arrangement of instructors, and enlargement of mandatory employment and increment of financial support.

One of these efforts is to establish vocational training courses. The present Education Law Art. 143 Clauses 2. the Education Law of Elementary, Middle and High school Art. 56 and the Promotion Law of Special Education for the Retarded Art.21 allow that the graduates from the
course (including the graduated from the special class of high school) can take the vocational
course over one year for the professional skills. The vocational training courses are arranged
depending on regions and the kinds of retardation. The special schools with the vocational
training courses are totally 45 schools including 35 schools for the mental retarded, 117 classes,
and 1,216 students in March, 2006. These vocational training courses are mostly 2-year-course
(26 schools), 1-year-course in 15 schools and 3-year-course in 4 schools.

Table 1: Changes of vocational training course in the special Korea schools for the
mental retarded (unit: schools, classes, students)

<table>
<thead>
<tr>
<th>Kind of retardation</th>
<th>Mental retardation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
<td>2006</td>
</tr>
<tr>
<td>Number of schools</td>
<td>19</td>
<td>35</td>
</tr>
<tr>
<td>Number of classes</td>
<td>49</td>
<td>94</td>
</tr>
<tr>
<td>Number of students</td>
<td>583</td>
<td>1,006</td>
</tr>
</tbody>
</table>

Reference: Ministry of Human Resource for Education. Annual report of special

The number of vocational training courses for the retarded are increasing as shown in
Table 1.

This study analyzes how these efforts and managements contribute in quality
improvement of the disabled life and how much the effect of vocational education is.

2. Purpose of this study

The general purpose of this study was to analyze cost–benefit rates of vocational
education for the mental retarded people with supported employment.

The specific purposes were to analyze followings.

1) Individual and social education cost–benefit rates
2) Gender dependence of education cost–benefit rates
3) Academic background dependence of education cost–benefit rates
4) Degree of retardation dependence of education cost–benefit rates

3. Definitions of terms

1) The education cost–benefit rates are divided into individual and social rates.
   Individual cost–benefit rates are the education cost paid by the students or their
   parents, opportunity cost, and future incomes. Social cost–benefit rates are social
   education cost for individuals and future incomes. Social benefits are real income,
   protection cost which is necessary for unemployment, living cost support, and taxes.
2) The employment types of the disabled are divided into competition employment and supported employment. Competition employment has no difference between the disabled and the general person in employment, arrangement, promotion and wage. Supported employment admits the ability difference of the disabled special programs which are supported by public resources.

II. Research Method

1. Sample of this study

In order to achieve the goal of this research, 76 mental retarded people with supported employment, who worked in Kwangju or Jeollanamdo, were selected. They were divided into many groups considering whether they finished vocational training education or not, what the gender was, and how much they were retarded. The detail descriptions are following.

<Table. 2> Sample of this study

<table>
<thead>
<tr>
<th>Character</th>
<th>Group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>37</td>
<td>48.7</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>39</td>
<td>51.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
<tr>
<td>Research target</td>
<td>High school graduate</td>
<td>31</td>
<td>40.8</td>
</tr>
<tr>
<td></td>
<td>Vocational training graduate</td>
<td>45</td>
<td>59.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
<tr>
<td>Academic background</td>
<td>1st degree</td>
<td>16</td>
<td>21.1</td>
</tr>
<tr>
<td></td>
<td>2nd degree</td>
<td>28</td>
<td>36.8</td>
</tr>
<tr>
<td></td>
<td>3rd degree</td>
<td>32</td>
<td>42.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
<tr>
<td>Degree of retardation</td>
<td>Less than 840 US dollars</td>
<td>50</td>
<td>65.8</td>
</tr>
<tr>
<td></td>
<td>More 840 US dollars</td>
<td>26</td>
<td>34.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
<tr>
<td>Salary</td>
<td>Less than 840 US dollars</td>
<td>47</td>
<td>61.8</td>
</tr>
<tr>
<td>(When entering company)</td>
<td>More 840 US dollars</td>
<td>29</td>
<td>38.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Less than 12month</td>
<td>30</td>
<td>39.5</td>
</tr>
<tr>
<td>Duration of employment</td>
<td>More 12month</td>
<td>46</td>
<td>60.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>100</td>
</tr>
</tbody>
</table>
2. Methodology

This study utilized the fundamental data with the identical method for observing the cost–benefits of vocational education.

1) Education costs

(1) This study researched the public cost of the special education per person who were supposed to need the special education (Special Education Annual Report).

(2) In the case of survey for private education costs, the two experts (with doctor’s degree) for special education interviewed five mothers of the mental retarded students on the phone. In the case of private education costs, research object people were interviewed if possible. Otherwise, we interviewed their parents directly or on the phone.

The survey contents for investigating private education costs were following.

<Table. 3> Survey contents

<table>
<thead>
<tr>
<th>Classifications</th>
<th>Contents</th>
<th>Number of questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population sociological characteristics</td>
<td>Gender, Degree of retardation, Work type, Salary (August, 2006), Salary (When entering company), Duration of employment, Academic background</td>
<td>8</td>
</tr>
<tr>
<td>Private education costs</td>
<td>Tuition, Cost for books and educational materials, School supplies cost, Extracurricular cost, School selecting materials cost, Group work cost, Transportation cost, Meals, Boarding, etc.</td>
<td>10</td>
</tr>
</tbody>
</table>

(3) When observing opportunity cost of high school students, 49 people of 17 and 18 years old employees with retardation were considered. The portion of people with serious retardation was 0.2%. (Research for the Retarded Employees, 2005) The mental retarded people out of the serious retarded people were very small portion, so that we could exclude the mental retarded people for calculating the opportunity cost.

In the case of calculating opportunity cost of vocational training course graduates, the salaries of 20 and 21 years old people included average salary of high school graduates.

2) Education benefits

1) The wages of most disabled workers have not been raised for 12 months, so we calculated the cost–benefit as a fixed income.

3. Research Procedures

This survey was performed from March 1st, 2006 to February 28th, 2007.
Cost–benefit rates of 76 employees were calculated by Microsoft Excel Program. IRR and the variation of research groups were analyzed using SPSS (version 11.0).

IRR (Internal Rates of Return) method is to find discount rate (=internal rate of returns) which makes the NPV (net present value) of investment proposal be zero. If this value is large than capital cost, the proposal will be accepted. Otherwise, it will be rejected. In this research, education cost–benefit rates are calculated using IRR formula which decides whether the investment will be executed or not.

IRR is discount rate for NPV=0 and the formula is following.

\[
\sum_{t=1}^{T} \frac{CI}{(1+IRR)^t} = \sum_{t=1}^{T} \frac{CO}{(1+IRR)^t}
\]

<Formula.1> Calculation the internal rate of return

IV. Research results

The followings are individual and social cost–benefit rates of supported employment for the mental retarded people. The results are obtained as a function of Individual and social education cost–benefit rates, gender, academic background, and degree of retardation.

1) Individual and social cost–benefit rate of vocational education

<Table 4> shows individual and social cost–benefit rate of vocational education for the mental retarded people

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Individual cost-benefit rate</th>
<th>Social cost-benefit rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Considering</td>
<td>Disregarding</td>
</tr>
<tr>
<td>Wage raise</td>
<td>4.44(1.136)</td>
<td>1.63(1.594)</td>
</tr>
<tr>
<td>Total</td>
<td>4.44(1.136)</td>
<td>1.63(1.594)</td>
</tr>
</tbody>
</table>

If we take into consider wage raise, the cost–benefit rates of the mental retarded with supported employment are higher than those without wage rate. Considering wage rate, individual cost–benefit rates increased from 1.63(1.594) to 4.44(1.136) and social cost–benefit rate also increased from 2.58(1.315) to 5.32(0.910).

2) Gender dependence of individual and social cost–benefit rates of vocational training education
The followings are gender dependence of individual and social cost-benefit rates.

<Table. 5> Gender dependence of individual and social cost-benefit rates rate of vocational education

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male(N=37)</th>
<th>Female(N=39)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual cost–benefit rates (considering wage rate)</td>
<td>4.44(1.21)</td>
<td>4.43(1.08)</td>
<td>.024</td>
<td>.981</td>
</tr>
<tr>
<td>Individual cost–benefit rates (disregarding wage rate)</td>
<td>1.67(1.65)</td>
<td>1.59(1.55)</td>
<td>.219</td>
<td>.828</td>
</tr>
<tr>
<td>Social cost–benefit rates (considering wage rate)</td>
<td>5.50(0.85)</td>
<td>5.14(0.94)</td>
<td>1.737</td>
<td>.086</td>
</tr>
<tr>
<td>Social cost–benefit rates (disregarding wage rate)</td>
<td>2.66(1.44)</td>
<td>2.51(1.19)</td>
<td>.523</td>
<td>.603</td>
</tr>
</tbody>
</table>

<Table.5> shows gender dependence of individual and social cost-benefit rates using standard distribution. Generally, individual and social cost-benefit rates of males are slightly higher than those of female. The biggest difference is observed for social cost–benefit rates with considering wage rate. However, significance level is not less than 0.05, so this difference is not statistically meaningful.

3) Academic background dependence of individual and social cost–benefit rates

The followings are academic background dependence of individual and social cost–benefit rates.

<Table. 6> Academic background dependence of individual and social cost–benefit rates.

<table>
<thead>
<tr>
<th>Academic background</th>
<th>High school graduate(N=31)</th>
<th>Vocational training course graduate(N=45)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual cost–benefit rates (considering wage rate)</td>
<td>4.79(1.24)</td>
<td>4.19(1.00)</td>
<td>2.305*</td>
<td>.024</td>
</tr>
<tr>
<td>Individual cost–benefit rates (disregarding wage rate)</td>
<td>2.21(2.23)</td>
<td>1.24(0.75)</td>
<td>2.339*</td>
<td>.025</td>
</tr>
<tr>
<td>Social cost–benefit rates (considering wage rate)</td>
<td>5.36(1.10)</td>
<td>5.29(0.76)</td>
<td>0.343</td>
<td>.732</td>
</tr>
<tr>
<td>Social cost–benefit rates (disregarding wage rate)</td>
<td>2.86(1.86)</td>
<td>2.40(0.71)</td>
<td>1.311</td>
<td>.198</td>
</tr>
</tbody>
</table>

* p<0.05  **p<0.01  ***p<0.001
Table 6 is the results of distribution examination in order to find out academic background dependence of individual and social cost–benefit rate. As shown in Table 6 considering wage raises, individual cost–benefit rates were about 4.79(1.27) for high school graduates, 4.19(1.00) for those who graduated from vocational training course. Disregarding wage raises, individual cost–benefit rates were 2.21(2.23) for high school graduates, 1.24(0.75) for vocational training course graduates. When we considered individual cost–benefit rates, the rates of high school graduates were higher than the rates of those who graduated from vocational training course regardless of wage raises and there was a 0.05% difference of significance level. The reason is that the high school graduates do not need education cost, transportation cost, and private education cost during vocational training course.

4) Degree of retardation dependence of individual and social cost–benefit rates

The followings are degree of retardation dependence of individual and social cost–benefit rate.

Table 7 is the results of distribution examination in order to observe degree of retardation dependence of individual and social cost–benefit rate. Considering wage raises, individual cost–benefit rates were 4.04(0.5979) for 1st degree retardation, 4.38(1.4902) for 2nd degree retardation, and 4.67(0.9356) for 3rd degree retardation. The case of 3rd degree retardation was largest, but the difference was statistically negligible.
Disregarding wage raises, individual cost-benefit rates were 1.04(0.9027) for 1st degree retardation, 1.55(1.1349) for 2nd degree retardation, and 2.00(2.0742) for 3rd degree retardation. However, the difference was statistically negligible.

Disregarding wage raises, social cost-benefit were 1.98(0.8354) for 1st degree retardation, 2.47(0.7703) for 2nd degree retardation, and 2.99(1.7248) for 3rd degree retardation. There was a 0.05% difference of significance level, so it was meaningful difference.

V. Conclusions and suggestions

1. Conclusions

From this study, we found cost-benefit rates of vocational education for the mental retarded people with supported employment. The conclusions of the research are following.

First, considering individual and social cost-benefit rates, social cost-benefit rates are generally higher than individual cost-benefit rates. Considering or disregarding wage raise, individual cost-benefit rates were 4.44 and 1.63, respectively, and social cost-benefit rates were 5.32 and 2.58, respectively. When wage raises were considered, individual and social cost-benefit rates of males were 4.44 and 5.50, respectively. When wage raises were disregarded, individual and social cost-benefit rates of males were 1.67 and 2.66, respectively. The case of female showed also similar tendency. When wage raises were considered, individual and social cost-benefit rates of females were 4.33 and 5.14, respectively. When wage raises were disregarded, individual and social cost-benefit rates of females were 1.59 and 2.51, respectively. The same tendency was obtained dependent of degree of retardation, whether the vocational training courses were completed or not. These results mean that enlargement of social investment can contribute to social development in the future. Cost-benefit rates of vocational education for the mental retarded people strongly depended on whether wage raises were considered or not. If salary and promotion policies for the retarded people are based on the individual ability and working experience, the policies should be more effective.

Second, considering the gender dependence of cost-benefit rates, generally, individual and social cost-benefit rates of males are slightly higher than those of female. The biggest difference is observed for social cost-benefit rates with considering wage rate.
However, significance level is not less than 0.05, so this difference is not statistically meaningful. This means there is no gender dependence of cost-benefit rates.

Third, considering the academic background dependence of cost-benefit rates, cost-benefit rates of vocational training course were relatively low. Considering wage raises, individual cost-benefit rates were 4.79 for high school graduates, 4.19 for vocational training course graduates. Disregarding wage raises, individual cost-benefit rates were 2.21 for the high school graduates, 1.24 for the vocational training course graduates. The reason was that there was no salary difference between the high school graduates and the vocational training course. The other reason is that the vocational training course needs additional investment.

The problem of vocational training course is not from program itself but from salary system, and therefore the employer should try to enhance the viewpoint of the retarded and salary system in addition to the development of technical skill and career.

Forth, considering the degree of retardation dependence of cost-benefit rates, cost-benefit rates decreased with lighter degree of retardation. The reasons are that the retarded people with lighter degree of retardation need smaller medical education and private education costs as well as earn more incomes after graduation.

2. Suggestions

In Korea, considering the employment of the mental retarded people, cost-benefit rates were relatively low and especially individual cost-benefit rates are worse. This phenomenon is waste of human resources and big obstacle to social development. The investment for the mental retarded people is not absolutely wasteful and it can bring meaningful investment. In order to obtain higher cost-benefit rate, correct understanding of the mental retarded is necessary in addition to the development of new job and the improvement of salary system.

In order to obtain efficient cost-benefit rates of vocational training courses which have lower cost-benefit rates than high school education, actual in-service training is necessary outside the school through collaborating with relative institutions such as Ministry of Labor and Korea Employment Promotion Agency for the Disabled.

In addition, the employer should enhance the viewpoint of the retarded people to compensate the salary based on the employee’s qualification, technical skill and experience.
References


http://www.rational.co.kr/IDC_1/rcc02.htm [rational.co.kr. Rational Clear Case]
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The purpose of this study is to research cost - benefit rates of vocational education for people with supported employment mental retardation.

The period of research was 1 year, from March, 2006 to February 28th 2007 and the subjects were 76 people who our team interviewed ourselves. Our team analyzed the differences of cost - benefits rates of vocational education according to their genders, academic backgrounds and degree of their retardation.

The results of the research are as follows:

First, social cost-benefit rates are generally higher when comparing individual and social cost-benefit rates. Considering wage raise, individual earning rates increased from 1.63(1.594) to 4.44(1.136) and social investment from 2.58(1.315) to 5.32(0.910). Therefore the way to make use of salary classes, raises in salary and promotion should be sought to improve their practical employment preservation and their quality of lives.

Secondly, no differences were found between individual and social cost - benefits rates according to genders. Without considering wage raises, individual investment rates of males were slightly higher at 1.67(1.65), compared with those of females at 1.59 (1.55). When wage raises were considered, social rates of males were 5.50(0.85), while those of females were 5.14(0.94). In the case where wage raises were not considered, male's rates were slightly higher at 2.66(1.44), and female's were 2.51(1.19).

Third, when considering academic backgrounds, individual and social investment earning rates were about 4.79(1.27) for high school graduates, 4.19(1.00) for those who graduated from vocational training course. Without considering wage raises, individual earning rates were 2.21(2.23) for high school graduates, 1.24(0.75) for vocational training course graduates. When it comes to individual rates, the rates of high school graduates were higher than the rates of those who graduated from vocational training course regardless of wage raises and there was a 0.05% statistical difference in
significance level. This is because there was no wage difference whether they took vocational training courses or not but the investment cost was spent for them. In case of social earning rates, it appears that the rates of high school graduates were slightly higher than the rates of those who graduated from vocational training courses, but there was no significant difference statistically.

Forth, when considering the degree of mental retardation, individual and social investment earning rates of vocational education were generally higher in cases of 3rd level retardation. However when wage raises were not considered, social earning rates were 0.05%, which is a statistically significant difference. It is concluded that when the degree of retardation is low, the treatment education cost or tutoring educational cost is less.

This study suggests that if we raise pay wage proportionately considering capability and years of working, individual and social earning rates of people with mental retardation will be high and the quality of their lives as well. Considering earning rates of investment to mentally retarded people, social earning rates are higher than individual rates. Therefore increasing the scale of investment will contribute to the social development. So we have to make educational courses focused on field practice and change the mind-set of employers for them to give proper rewards regarding qualifications, skills and expertise improved in their vocational training course.