

Overview of "the Determinants of Academic Achievement"

1. Purpose and Overview of the Survey and Research

(1) Purpose of the Survey and Research

This study aims to statistically detect determinants of academic performance of the students in elementary and secondary schools in Japan with the use of a micro-data set of "the Curriculum Implementation Survey" collected by the National Institute for Educational Policy Research, looking into the relation between surveyed question items and test scores.

(2) Overview of the Survey and Research

Main tasks of this study are:

- 1) Identifying the impact of school size on academic achievement,
- 2) Verifying the impacts of education methods on school performance for each subject, and
- 3) Clarifying complementarity between different subjects.

This study aims to analyze a micro-data set of "the Curriculum Implementation Survey" statistically. One of the features of the data is that they were collected through a questionnaire survey of the students who took all tests of every subject and a different questionnaire survey of the teachers who are in charge of those students. Since new IDs were provided to schools, classes and students for anonymization, identifying them is not possible after the surveys. However, the same IDs were given for test scores and the surveys of teachers and students, and we could match the three sets of collected data, which is a useful quality unique to the data.

[Study period: FY 2012- FY 2013, Leader: MATSUSHIGE Hisakazu (Professor, Osaka School of International Public Policy, Osaka University)]

2. Outline of Research Results

(1) Relation between school size and score and gender differences seen in the relation

Using a micro-data set of "the Curriculum Implementation Survey in Elementary/Junior High Schools" conducted in 2003, we calculated average scores per class size (four subjects for fifth grade in elementary schools and five subjects for first and second grades in lower secondary schools) and looked at whether the averages of the test scores of student children learning in smaller sized classes were higher or not. Results of the analysis indicated that students in smaller sized classes tend to show higher academic achievement in the case of the fifth grade students in elementary schools while, in the case of the students in the first and second grades in lower secondary schools, there were no clear differences between different class sizes.

(2) Past records of basic academic skills and college-going by subject in upper secondary school

Based on a micro-data set of the "2002 Curriculum Implementation Survey in High Schools", we

examined how basic academic skills of upper secondary school students are distributed in each subject, and the relative relation between basic academic skills in different subjects at the national level. At the same time, we investigated divergence between past actual records of college-going and "expected college-going rate" which is a desirable ratio of university advancement based on basic skills for each upper secondary school subject.

The analysis results revealed that basic skills relatively vary not only among different subjects but also within the same subject, and that there is a polarized tendency in basic skills for each subject, especially in the case of the general course. Moreover, it was slightly shown that there is a tendency that students advance on to higher education with their basic skills being insufficient in the case of fishery and nursing courses, and, in the case of the industrial course, some students are not offered opportunities to go on to the universities suited to their basic skills.

(3) Hierarchical structure of upper secondary schools/desired plans after graduation/learning activities: the study on learning-activity gap among schools based on the 2005 Curriculum Implementation Survey in High School

In a society which demands that people continue to learn on their own in the highly mobile "knowledge economy", it is increasingly important to ask if there are any relations between the operative agents, the home environment, the education system, and the effort. In this chapter, we empirically examined the relation between the hierarchical structure of upper secondary schools (ex. ranking, subjects) and learning activities while paying attention to desired plans after graduation. As a result of the analysis, we found that the ratio of students wanting to go on to the universities at each upper secondary school is affected by the hierarchical structure of upper secondary schools, creating gaps in learning activity, "learning for long hours", among schools.

(4) The relation between education methods and subject preference of children

Looking into "2003 Survey (math for the fifth and sixth grades in elementary school, math and English for the first to third grades in lower secondary school)" and "2005 Survey (math and English for the third grade in upper secondary school)", we assessed the relation among various education methods conducted by teachers and children's preference for subjects (like or dislike of subjects). While a number of researches were carried out on children's academic skills and willingness to learn, following arguments on declining academic standards, only a few attempts have so far been made to study the subject preferences of children, although it is an element influencing the decline of academic standards. The findings of the analysis show that factors outside school such as family and regional environment should not be ignored while educational methods do not affect subject preference much. Moreover, while there are educational methods that have positive relations with subject preference such as "learning incorporating developmental tasks" and "extra teaching after school for children with insufficient understanding", there also exist education methods with no clear relations with subject preference such as "classes utilizing computers," and it is considered necessary to select appropriate educational methods depending on

learning level.

(5) Determinants of grades in English in lower secondary/upper secondary school: information equipment, teaching assistance from native speakers and the effects of class size

We investigated what factors help students get good grades in English using data collected through the "2003 Curriculum Implementation Survey in Elementary/Junior High Schools", the "2002 & 2003 Curriculum Implementation Survey in High Schools" and the "2005 Curriculum Implementation Survey in High Schools" targeting upper secondary schools. Particular attention was paid to the effects of introducing computers, impacts of teaching assistance from native speakers and class size. The analysis results did not show any tendency that information equipment improved grades in English, unlike overseas surveys. In addition, we could not find enough evidence to show that teaching assistance from native speakers enhanced English proficiency. Moreover, it was found that class size actually has a positive relation with academic results and small-group instruction is not necessarily effective. On the other hand, we can say that, from the results of analysis, know-how and experience in teaching English are accumulated, since the number of years of experiences of teachers have a consistent positive relation.

(6) Does the gender of students and teachers affect academic results?

In overseas countries, it has been debated whether the gender of teachers affects female students' grades in science subjects and career choices. This study analyzed the impacts of gender of students and teachers on academic results by using a micro-data set of the "2003 Curriculum Implementation Survey in Elementary/Junior High Schools". The subjects of the analysis were grades in math and Japanese language for the fifth and sixth grades of elementary schools and the first, second and third grades of lower secondary schools. The results of analysis indicated that female teachers affect students' academic results in a positive manner or do not affect them at all and that positive effects were distinctively more on female students than male students and more in math than in Japanese language.

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