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PERFORMANCE INDICATOR FOR INITIAL VOCATIONAL EDUCATION AND TRAINING IN FINLAND 2011

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1 Introduction

The objective of the Performance Indicator and performance-based funding is to support improvement of educational outcomes and to encourage education providers to engage in long-term and goal-oriented development work. A further objective is to facilitate achievement of the goals set for vocational education and training. The Performance Indicator offers information for development and steering for both education providers and educational administration. The Performance Indicator is calculated and used annually for allocation of performance-based funding.

The Performance Indicator for vocational education and training was developed in the early years of this century and was first introduced in performance-based financing in 2002. The indicator was revised ten years later and the revised indicator was used for performance-based funding from 2011. The targets of evaluation of performance have been derived from the objectives that legislation and the Ministry of Education and Culture specify for vocational education and training. The development work for the Performance Indicator and performance-based funding has been conducted by the Ministry of Education and Culture in close cooperation with education providers, researchers and data producers.

The Performance Indicator consists of three indicators: an Outcome Indicator, a Teacher Competence Indicator and a Staff Development Indicator. The elements observed when determining performance are students' employment after graduation, the proportion of students embarking on further studies, completion of the education and training within the expected time, the drop-out rate from education, the professional qualifications of teaching staff and the amount of resources invested in personnel development. The Performance Indicator compares the performance of education providers.

The publication was written by Heikki Havén and Mika Tuononen, expert from Statistics Finland.

The indicators and indicator information concerning education providers is public and it is published in Finnish on the Internet at: http://www.oph.fi/asiakkaat/rahoitus/tulosr11/tulosr_11.html.

2 Initial vocational education and training in Finland

Initial vocational education and training (IVET) takes three years of full-time study at upper secondary level. The scope of vocational qualifications is 120 credits. Initial vocational education and training aims to provide the necessary vocational knowledge, skills and competences for working life and to encourage lifelong learning. It also gives general eligibility for polytechnic and university studies. Initial vocational education and training includes theoretical instruction given by vocational institutions and a supervised on-the-job-learning period (lasting at least six months). It can also take the form of apprenticeship training, in which case 70 to 80 % of the training takes place at the workplace. Qualifications can also be taken as competence-based qualifications, where the obtained skills are demonstrated in competence tests.

In 2008, 51 % of pupils in the final grade (year 9) of comprehensive school immediately continued their studies in general upper secondary education, 42 % opted for vocational education and training, while 2 % continued in the voluntary additional 10th grade of comprehensive school and another 5 % did not immediately continue their studies.

Students can enter upper secondary level VET not only when leaving comprehensive school, but also at later stages of their education. In 2008, the educational backgrounds of new students were as follows: 50 % had a leaving certificate from comprehensive school, 14 % had passed a matriculation examination (general upper secondary education), 24 % had a prior upper secondary vocational qualification and 12 % had either a polytechnic or a university degree.

The median age of students entering school-based initial vocational education and training was 16 years in 2008. Entrants also include students from older age groups. 18 % of new students were aged over 20 in 2008.

Approximately 60 % of first-year students graduate in three years as expected. The median age of school-based IVET graduates was 20 in 2008. Of these, 5,5 % were aged over 30 and 0,5 % were over 50. Students in apprenticeship training were clearly older. The median age of apprenticeship training graduates in IVET was 37 years in 2008.

About 15 % of graduates in initial vocational education and training continued studies at tertiary level (polytechnic and university education). Almost 14 % of graduates continued studies in polytechnic education and 1,4 % moved on to university.

About half of the students are female and half are male. Initial vocational education and training is available in eight fields (listed in order of magnitude): Technology and Transport; Social Services, Health and Sports; Tourism, Catering and Domestic Services; Business and Administration; Culture; Natural Resources and the Environment; Computing; Humanities and Education.

In addition to tertiary level university and polytechnic education, it is possible to continue vocational studies in upper secondary and post-secondary non-tertiary level in further vocational education and training. Further vocational education and training leads to further and specialist vocational qualifications, which are competence-based qualifications.

2.1 Providers of vocational education and training

Providers of vocational education and training are responsible for organising education and training in their respective regions, matching provision with local market needs and devising curricula based on the National Core Curricula and Qualification Requirements specified by the Ministry of Education and Culture.

In 2008, there were 169 providers of initial vocational education and training under the supervision of educational administration, with a total of 234 vocational institutions. Some of these providers are not included in the performance-based funding system. For example, providers with less than 45 students are not included.

The size of providers varies from several thousand to less than a hundred students. The largest IVET providers may have thousands of students and may operate several vocational institutions across a large area covering several municipalities. In 2008, the total number of students in IVET was 177 000. Of these, 17,8 % were in apprenticeship training.

2.2 Funding of initial vocational education and training

The responsibility for funding vocational education and training is divided between the State and municipalities. State funding (statutory government transfers) covers about 40 % of all public funding. State funding covers both municipal and private providers equally. The funding criteria are the same irrespective of ownership type (public/private). Education providers (municipal and private) must be authorized by the Ministry of Education and Culture to organize vocational education and training.

Statutory government transfers are granted on calculatory grounds which are confirmed annually. Funding is based on a unit price and the number of students. The unit price is calculated based on actual current expenditure (unit costs per year per student) and the fields of education available from each provider. Education providers are independent in terms of their financial decision-making.

In addition to the above-mentioned statutory core funding, 3 % of the public funding allocated to education providers is based on the performance of each individual provider. Performance-based funding is first deducted from the total public funding and then reallocated to education providers based on the performance indicated by the Performance Indicator. Performance-based funding is allocated to 4/5 of the education providers based on the Performance Indicator value and student numbers.

3 Outcome Indicator

The Outcome Indicator measures the performance of education providers based on the outcomes of their students. The outcomes are related to completion of qualifications, as well as to further studies and employment.

Detailed individual-level data is used to estimate the impact of the education provider on the outcomes, while also controlling other factors that may affect these outcomes. The indicator is calculated on the basis of the estimates from this model.

3.1 Data

The data used to calculate the Outcome Indicator was compiled from several registers at Statistics Finland. Statistics Finland collects and maintains individual data on students and graduates from educational institutions and various registers. The data contains detailed information on the characteristics of the individuals, their enrolment, completed qualifications, their labour market status, place of domicile, etc. The data is processed with due consideration for statistical data privacy and data security specifications. Information concerning individuals cannot be identified from the indicator results. No separate surveys for students are conducted.

Data for the Outcome Indicator covers students in initial vocational education and training; students in further vocational education and training are not included in the Outcome Indicator.

Before the calculation process, several exclusions are first made from the student numbers. For example, education providers which are not under the supervision of educational administration or are very small (less than 45 students) are excluded. State institutions and institutions in the autonomous region of the Åland Islands are not included in the performance-based funding system. Likewise, students in military or non-military service at the end of the reference period or whose data is incomplete are also excluded.

The calculation of the Outcome Indicator covers all students (noting the exceptions above) enrolled in initial vocational education and training in a given year. This is the beginning of the reference period. The outcomes of these students are followed for the subsequent three years, which marks the end of the reference period.

3.2 Outcomes

The performance of education providers is measured by the outcomes of their students. The outcomes are divided into 5 ordered categories based on whether the individual has completed a qualification during the reference period and on their labour market status at the end of the reference period. The categories are mutually exclusive, meaning that an individual is placed into one category only. The performance of an education provider is considered to be the better, the more of its students are placed in the higher-ranking outcome categories.

Individuals who have completed initial vocational education and training during the reference period are classified into the three highest-ranking outcome categories. The highest-ranking result (TR1) includes graduates who are employed at the end of the reference period. The second highest category (TR2) includes those who are in further education at tertiary level (polytechnic or university education) at the end of the reference period. The third highest category (TR3) includes the rest of the graduates.

The two lowest-ranking outcome categories include those individuals who did not complete initial vocational education and training during the reference period. Of these, category (TR4) includes those who are employed or studying, or who have received some other educational qualification. The lowest-ranking category (TR5) includes all the rest.

Table 1 shows the overall placement of all students in the 2005–2008 reference period.

Table 1. Placement of students into the five outcome categories

Observation period 2005–2008		%
Graduates	TR1. Employed	51,1
	TR2. Further studies	2,9
	TR3. Non-employed and not in further studies	15,7
Non-graduates	TR4. Employed or student	23,2
	TR5. Non-employed and non-student	7,1
Total		100,0

3.3 Control factors

The outcomes of education providers may be affected by various factors that are not attributable to their effort or success. Education providers differ from each other in terms of regional location, the fields of education available, type of education and the characteristics of the students enrolled. Taking into account background factors that affect student outcomes improves comparability between education providers.

The background factors listed below are used to account for differences in the students' chances of reaching each of the outcome categories. A single student may possess features that increase their probability of graduating, of finding work and of continuing studies, as well as features that decrease these probabilities.

a) **Characteristics of individuals**: age, gender, mother tongue, family status (marital status, children), average grade on the leaving certificate from comprehensive schooling, qualifications completed before the reference period.

b) **Characteristics of education**: starting term of studies, field of education, type of education (e.g. apprenticeship training), enrolment in a special needs programme, IVET student studying in upper secondary general education at the same time

c) **Characteristics of the region:** individuals' sub-region of residence at the end of the reference period.

3.4 Calculation of the Outcome Indicator

A linear regression model is used to estimate the probability that a student reaches each of the outcomes. This means running five linear regressions (one for each possible outcome), where the dependent variable takes the value of one if the student has reached the particular outcome. The key explanatory variable is an indicator for the education provider of the student. In addition, a number of background factors are controlled. These estimations produce five coefficients for every education provider, each measuring the impact the provider has on the student for reaching that particular outcome. The estimated coefficients for an education provider form the basis for calculation of the Outcome Indicator.

The linear regression model for each outcome category is formally as follows:

$$y_{ij} = \alpha + \gamma_j D_{ij} + x'_i \beta + \varepsilon_{ij},$$

where Y_{ij} takes the value of one, if student i of education provider j has reached the particular outcome and otherwise the value of 0. x_i is a vector of the student's background variables which are controlled (mother tongue, age, interaction term with gender and family type, an indicator for special needs students, GPA on the comprehensive school leaving certificate, first semester of studies, field of education, type of education, previous qualifications, studies in upper secondary general education at the same time, an indicator for the sub-region of residence). D_{ij} is an indicator variable equal to one if j is the education provider of the student i and zero otherwise. γ's are the estimated coefficients that measure the impact of the education providers. α is a constant and β's are the estimated parameters for the control variables and ε_{ij} is the residual.

The estimated coefficients of education providers measure their impact relative to each other. The coefficient for the mean impact is set to zero. A positive value for an education provider thus indicates that its students have a higher than average probability of achieving the outcome. The coefficients for an education provider over the five outcomes add up to zero, meaning that if an education provider increases the probability of reaching one outcome category, it must decrease the probability of reaching some of the other outcome categories.

The coefficients are weighted according to a weighting scheme to give the overall value of the Outcome Indicator. The weighting scheme gives more weight to the impact on the better outcomes. The impact on the most preferred outcome, which is having graduated and being employed, receives a weight of 10. The impact on having graduated and continuing in further studies is assigned a weight of 6, and that on having graduated but not being employed nor continuing studies receives a weight of 3. The impact on not having graduated but being

employed is assigned a weight of 1. Since the outcomes are mutually exclusive (and the coefficients over all the outcomes add up to 0), the impact on the least preferred outcome, i.e. not having graduated and not being employed, is accounted for through the coefficients of the other four outcomes.

3.5 An illustrative example

The following example demonstrates interpretation of the estimated coefficients and how the weighting scheme works to give the overall value of the Outcome Indicator. Table 2 presents the coefficients and the value of the Outcome Indicator for three randomly picked education providers A, B and C.

Table 2. Outcome coefficients and Outcome Indicator values for education providers

Observation period 2005–2008

Provider of education	Outcome categories					Sum of coefficients	Outcome indicator
	TR1	TR2	TR3	TR4	TR5		
	Graduates			Non-graduates			
	Employed	Further studies	Non-employed and not in further studies	Employed or student	Non-employed and non-student		
	Weight 10	Weight 6	Weight 3	Weight 1	Weight 0		
	Coefficients						
A	25,2	-5,2	0,8	-1,6	-19,2	0,0	222
B	2,5	-0,6	-0,4	-2,0	0,5	0,0	18
C	-26,1	-1,5	-5,7	32,0	1,3	0,0	-255

Education provider A has the highest value for the Outcome Indicator: 222. This is mostly explained by the large positive coefficient (25,2) on the most preferred outcome and the large negative coefficient (-19,2) on the least preferred outcome. This means that students of education provider A have a high probability of graduating and finding employment, relative to the average. Similarly, they are less likely to fail to complete a qualification and be unemployed. The value of the Outcome Indicator is obtained by multiplying each coefficient with its respective weight: $25{,}2 \times 10 + (-5{,}2 \times 6) + 0{,}8 \times 3 + (-1{,}6) \times 1$.

The performance of **education provider B** is close to the average. All of its coefficients are fairly close to 0. This means that it does not stand out as being particularly good in terms of placing its students in the most preferred outcomes, nor does it have a large impact on placing students in the least preferred outcomes either.

Education provider C has the lowest value for the Outcome Indicator, -255. The poor result of this provider is mainly due to the low graduation probability of its students, which is seen in the negative coefficients on the first three outcomes. In particular, this result is driven by the large negative coefficient (-26,1) in the most preferred outcome category and the large positive coefficient (32,0) in TR4.

4 Teacher Competence Indicator

The Teacher Competence Indicator describes teaching staff's formal qualification level. The indicator is the proportion of formally qualified teachers among all teachers. The objective is that this proportion should be as high as possible. The indicator is a percentage value.

The main rule for competence requirements for teachers in vocational education and training is that teachers must have a university or polytechnic degree and pedagogical studies which are suitable for the field of education and general subject taught. 72 % of teachers in vocational education and training were formally competent for the post they were holding in 2008.

Data for the Teacher Competence Indicator and the Staff Development Indicator is collected by the Finnish National Board of Education from education providers. The data is the aggregate sum data for each education provider.

5 Staff Development Indicator

The Staff Development Indicator describes the education provider's investment of financial resources in developing and maintaining their staff's professional competence. The indicator for staff development is the proportion of all personnel expenditure spent on staff development. The objective is that the financial investment in staff development is as high as possible. The indicator is a percentage value.

Expenditure on staff development includes expenditure on staff training and expenditure on teachers' professional development placements. The professional development placements of the teachers are periods when teachers are familiarizing themselves and/or working in an enterprise or a corporation within their field of expertise.

6 Calculation of the Performance Index

The Performance Index is made up of the above-mentioned three indicators: the Outcome Indicator, the Teacher Competence Indicator and the Staff Development Indicator. The weights of the indicators are: Outcome Indicator 90 %, Teacher Competence Indicator 7 % and Staff Development Indicator 3 %. The calculation and weights of the indicators are specified in Government Decree 1766/2009.

An education provider's Performance Indicator value is derived from the following formula in which each indicator's values are first standardized to the normal distribution scale:

The weighted indicator value: (0,90 × Outcome Indicator)+(0,07 × Teacher Competence Indicator)+(0,03 × Staff Development Indicator).

The standardized indicator value is derived by dividing the weighted indicator value presented above by a factor: $\sqrt{((0{,}90)^2 + (0{,}07)^2 + (0{,}03)^2)}$.

The Performance Indicator values vary on both sides of value 1000. The average result compared with other education providers is indicated by value 1000. The Performance Indicator value is calculated by multiplying the standardized indicator value by 100, then by adding the value 1000 and approximating to the nearest whole number as follows:

Provider	**A**	**100**	**x**	**0.883**	+	**1000**	=	**1883**
Provider	**B**	**100**	**x**	**-1.016**	+	**1000**	=	**898**
Provider	**C**	**100**	**x**	**0.206**	+	**1000**	=	**1021**

Education provider A demonstrates the best performance with indicator value 1883 and provider B shows the weakest performance with indicator value 898. Provider C (1021) was slightly above average.

In 2011, the Performance Indicator values for initial vocational education and training in Finland varied between 1233 and 571.

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