

# The Performance-Based Funding Scheme of Higher Education Institutions

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**Abstract**—The purpose of this study is to assess the new performance-based funding scheme of the Finnish universities of applied sciences. In many countries, such schemes have largely failed and have been uneven and unstable. The results of this study indicate that, in Finland, the funding scheme has improved the graduation rates, especially among male students. This study proposes the use of the balanced scorecard approach to improve the funding scheme. The learning and growth perspective of the balanced scorecard is non-existent in the Finnish scheme, which means that the funding scheme does not include the research and teaching skills necessary to achieve efficient and effective processes and high quality. Moreover, the funding scheme does not include the funding of education, which is important in market-oriented education. The research findings of this study are useful for those who want to modify the funding scheme so that all the necessary indicators are incorporated in the improved scheme.

**Index Terms**—financing, funding scheme, incentives, performance, higher education

## I. INTRODUCTION

The slow economic growth and public deficits have attracted much attention to the costs and performance of higher education institutions. Performance-based funding of institutions uses incentives with the particular objective of stimulating improvements in the quality and efficiency of the teaching process. Public policy aims for institutional accountability, and performance-based funding is an important mechanism to motivate institutions. The effectiveness of performance-based funding is limited in many countries, however, because public funding comprises only a small portion of total funding [1]. It is thus interesting to analyze the case of Finland, which has adopted performance-based funding and does not have tuition fees.

Most industrial countries have traditionally subsidized the provision of higher education, but alternative funding schemes, which rely on larger contributions from students, are being increasingly adopted [2]. Higher education institutions throughout the world face problems because they are underfunded, and the funding of universities in many countries is regressive [3]. Higher education is costly, and only a few countries rely wholly on public funding. Finland is one of those countries in which higher education institutions are not able to collect tuition fees

for degree education. Therefore, the political decision makers have sought to improve incentives for higher education institutions through the use of a funding scheme to improve the institutional performance.

The purpose of this study is to assess the impact of the performance-based funding scheme of the Finnish universities of applied sciences. This scheme was adopted at the beginning of 2014 [4], and no robust underlying theory was used when it was developed. This study analyzes the funding scheme using the balanced scorecard approach, which can be used to detect the missing elements of the funding scheme and ensure that all the necessary indicators are included in the scheme. The study shows that the missing elements are related to research and teaching capabilities and the funding of education.

One of the problems in performance funding in the United States has been that the state adoption of such funding has been uneven and unstable; only half of the states have adopted performance funding for higher education, and half of those states later eliminated it [5]. Moreover, the states that have retained performance funding have often and substantially changed both the amount of funding they allocate for performance funding and the criteria by which they award funding [6]. The balanced scorecard approach is an important tool for the planning of greater stability, because it has been planned to achieve stability in the implementation of the future plans.

The empirical part of the study analyzes the transfer from the input funding scheme based on the number of students to the output-based performance funding based on the number of graduates and other output measures. The new funding scheme of the Finnish universities of applied sciences has eleven output-based indicators, and all of the funding for the degree education comes from the state. The political parties have not allowed institutions to collect tuition fees in degree education. Income can only be gathered for Research and Development (R&D), continuing education and service to society. There is no financial autonomy in degree education, because the Ministry of Education and Culture controls the institutions in a very stringent way, which does not leave much space for autonomy and strategic plans for the institutions to seek success in their own ways.

The remainder of this paper is organized as follows. The next section includes the literature review, which

shows that performance-based funding schemes in higher education are common but have largely failed to achieve any real improvement in student outcomes. The third section presents the data and methodology used in the study; specifically, it outlines the funding scheme of the Finnish universities of applied sciences and transfers it to the strategy map, which can be used to reveal the unbalanced indicators of the funding scheme. The results and discussion in the fourth section present examples of how the funding scheme can be improved to ensure that all the necessary elements are included in the model to improve the communication and implementation of education policy. Concluding comments are presented in the final section.

## II. LITERATURE REVIEW

In a typical funding scheme in most countries, students invest financially in human capital by taking on debt in order to pay at least a part of their tuition fees and living costs during the course of their studies and to later produce a return on this investment in the labor market. Flacher *et al.* [7] argue that tuition fees established freely by universities 1) benefit upper classes, who are over-represented among students, 2) are economically efficient since they induce self-selection based on students' private information regarding their skills and 3) provide an opportunity to fulfill the funding requirements of the universities in some countries without putting weight on public expenditures.

Governments have shifted the costs of higher education in many countries to parents and students. This worldwide trend results in the introduction or the sharp increase of tuition fees and user charges [8]. The educational ambition of students depends positively on their individual social backgrounds (a theory that is empirically tested by Holm and Jaeger [9]). Vandenberghe and Debade [10], estimating how students' contributions to higher education institutions have affected the return on educational investment, found that increasing contributions do not significantly affect the private rate of return.

Schily [11] reports about a German innovative tuition fee system called "reversed generational contract". When the financial crisis in 1995 threatened the future of Witten/Herdecke University, tuition fees became part of the plan to secure the future of the institution in addition to the funding based on donations, grants and their own revenues. The new model was planned by a group of students who were convinced that access to education should not be dependent on one's financial means. According to the income-contingent model, the graduates pay a fixed percentage of their incomes over a set period of time. In that model, the students are able to enroll education regardless of their own and their parents' financial situation, and they are not forced to keep the duration of their studies as short and as inexpensive as possible.

The previous studies cited above analyzed a situation in which students contribute to their education either through tuition fees or after graduation through loan

payments from their income based on education. These are self-funding schemes in which the inter-temporal trade-off of resources is used to allocate future resources to the present day. Finland has a contributory funding scheme based on intergenerational solidarity, through which today's active workers and other tax payers pay the tuition fees of today's students, who, as tomorrow's active workers, will in turn contribute to financing tomorrow's students. This system presumes higher education institutions funded by taxation. Glennerster *et al.* [12] argued that progressive taxation would raise more funds for higher education compared to a system of tuition fees and income-contingent loans.

The performance-funding policies of public universities link institutional funding to the achievement of political objectives. Political decision making can involve implementing incentives in the funding scheme to improve performance and set sanctions for poor outcomes. Performance-based funding, which has received considerable attention from scholars [13]-[16], [5], raises the importance of public accountability and dilutes the scope of institutional autonomy [13], [17]-[19].

Volkwein and Tandberg [1] studied accountability policies and governance reforms and found that performance-funding policies largely failed to achieve any real improvement in student outcomes. The dataset ranged from 2000 to 2006, and a variety of state contexts were controlled for to isolate the effect of accountability and governance reforms. Nisar [20] found that most impact assessment studies have shown that such policies have had a limited effect on the performance of higher education institutions in the United States. Also, Dougherty *et al.* [21] concluded that performance-based funding has done little to improve educational outcomes and that the underlying theory of action behind performance funding is not well understood or articulated.

## III. DATA AND METHODOLOGY

### A. The Funding Scheme

Funding schemes are tools for steering higher education institutions. In Finland, the funding scheme has turned out to be even more important than the strategic plans of higher education institutions. Typically, only a relatively small amount of strategic funding is allocated to implement strategic plans; therefore, these plans have not been very effective, whereas the whole amount of state funding guides the institution to achieve the objectives described by the indicators. If an institution is able to improve its state funding, the funding is taken away from others following the principles of a zero-sum game.

Fig. 1 describes the performance-based funding scheme of the Finnish universities of applied sciences after the reform at the beginning of 2014. The background of the reform was the universities' funding scheme that was adopted at the beginning of 2013, which was used to create a slightly modified scheme for the universities of applied sciences. There was no robust theoretical model for the new funding scheme, which was

instead based on the opinions of elected officials and various stakeholders. The preparation of the funding scheme was led by the Ministry of Education and Culture.

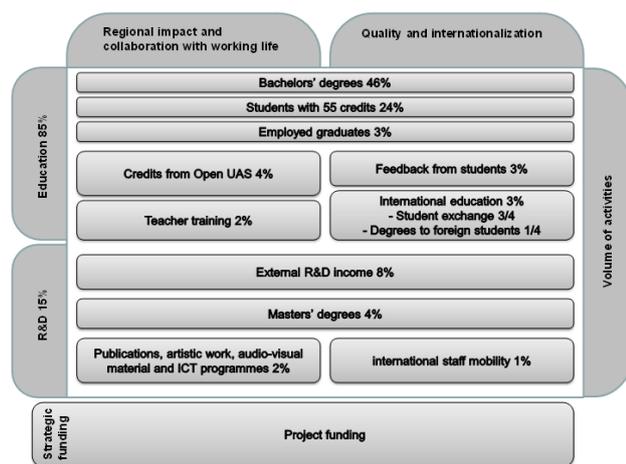


Figure 1. The funding scheme of the Finnish universities of applied sciences at the beginning of 2014.

The first vertical section of the funding scheme, which is titled “regional impact and collaboration with working life”, includes the main process of education to bachelor’s degree and employment. The indicator of the Open University of Applied Sciences (UAS) also includes special education and immigrant training. Teacher training is provided by five universities of applied sciences. It also includes the external R&D income, masters’ degrees and publications, including artistic work and the production of audio-visual material and Information and Communication Technology (ICT) programs. Regional impact and collaboration with working life do not cover feedback from students, international education or staff mobility in this scheme even though they are important from the viewpoint of working life.

The second vertical section, titled “quality and internationalization”, includes bachelor’s education, graduates’ employment, feedback from students and international education. It also includes the share of external R&D income, masters’ degrees and international staff mobility. Feedback from students is clearly an element of quality assurance and especially of continuous improvement with the phases of “plan”, “do”, “check” and “act” [22]. International education and staff mobility can be considered elements of quality, because they are also included in the ranking system of Times Higher Education. Quality does not concern the Open UAS, teacher training and publications in this funding scheme even though the Finnish Education Evaluation Centre, a quality assurance agency evaluates them in the quality audit.

The first horizontal section, titled “education 85%”, includes bachelor’s education and employment, credits from the Open UAS, teacher training, feedback from students and international education. Bachelor’s education has five criteria and a weight of 79%. The credits of the Open UAS can be transferred to degree education, but teacher training provides the qualification

for teachers. The purpose of the funding scheme is to create incentives to shorten the duration of studies and increase the number of degrees. The funding scheme also aims to create incentives to improve the internal efficiency and effectiveness of processes, achieve satisfied students and improve internationalization.

The second horizontal section, “R&D 15%”, aims to increase the external R&D income with a weight of 8%. The criterion encourages the staff of institutions to improve the external funding from the European Union, industry and other customers for the R&D projects. All these aims also improve the connections of the institution with working life. Publications and international staff mobility are encouraged by the funding scheme. The share of masters’ degrees has a weight of 4%. In fact, the master’s degree is mainly education in practice, while only a minor part, the thesis, can clearly be classified as R&D. The bachelor’s degree also includes a thesis, but it is classified as education.

Strategic funding is determined by the decision of the Ministry of Education and Culture, which wants to encourage the mergers, strategic alliances, structural changes and collaboration of the universities of applied sciences in order to achieve cost efficiency in higher education. Strategic funding is also used for the capacity building of the personnel. An example of strategic funding is the project that aimed to improve the R&D capabilities of personnel at the universities of applied sciences in order to help institutions increase external funding for R&D.

### B. Balanced Scorecard

The balanced scorecard approach was developed by Kaplan and Norton [23], [24]. Typically, strategic objectives are placed in four perspectives: customers, financial, processes and structures and learning and growth. There are also causal linkages between the objectives and perspectives. These elements can be placed in a strategy map to make sure that all the necessary elements are included so as to improve the communication and implementation of the strategic plan. Similarly, education policy is a plan for a better future that can be described by the strategy map. The balanced scorecard approach has been widely used in higher education [25]-[27].

The achievement of strategic objectives can be described by the indicators and their target values defined for the planning period. An alternative way of communicating and implementing the strategic plan is to establish development programs or projects. With those tools, the strategic plan can be implemented in the annual action plan so that with the timetable, responsibilities and funding they are believed to achieve the strategic objectives. Without proper implementation and communication, the achievement of strategic objectives may be unclear to the staff and management.

Fig. 2 describes the funding scheme of the Finnish universities of applied sciences, placed in the strategy map described in the framework developed by Kettunen [25], [26]. The strategy map reveals that most of the elements are in the teaching process, which includes

seven indicators. The R&D process includes only one indicator, which describes publications including artistic work, audio-visual material and information and ICT programs. The core of the strategy is in the activities. Therefore, it is reasonable to measure the processes with a realistic number of indicators.

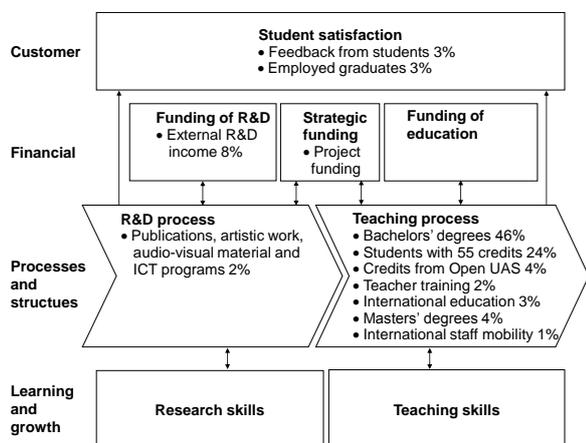


Figure 2. The funding scheme of the Finnish universities of applied sciences placed in the strategy map of the balanced scorecard.

The customer perspective includes the feedback from students describing their satisfaction. This may not always be a reasonable indicator, because student satisfaction can be achieved by many actions that are not related to learning. Some of the students, for example, may be satisfied with extra-curricular activities and avoid the hard work of learning. From the perspective of quality assurance, feedback from students is an important element, because it may reveal possibilities to improve education following the principle of continuous improvement. This perspective also includes the number of employed graduates, with a weight of 3%. This is a relevant indicator for the external impact of the institution even though its weight is rather small.

The financial perspective includes the share of external R&D income and strategic funding. The indicator of external R&D income is relevant because there is insufficient public funding available for R&D. The R&D projects funded by external funding are typically integrated into education so that students are provided opportunities to participate in these projects in order to carry out their practical training and write their theses. This perspective also includes strategic funding, which aims to improve the support services and structural changes provided by project funding. The funding of education does not include any indicators, even though it could include the funding of labor market training, management education, professional continuing education and service to society, among other things, to engage the institution in outreach and regional development.

The processes and structures perspective includes the general innovation chain of higher education, in which R&D serves education. R&D contains only publications including artistic work, audio-visual material and ICT programs. The teaching process includes seven indicators, with a total weight of 83%. These indicators aim to

promote the efficiency and effectiveness of the education and internationalization. Without an efficient education, financial success is not possible. It can be concluded that the number of degrees is a necessary and sufficient condition for the teaching outcome but that the number of students with 55 annual credits is not a necessary condition, because it describes the efficiency of the teaching process leading to the number of degrees.

The learning and growth perspective is important in the knowledge-intensive organizations because it describes the capabilities of staff to perform the processes efficiently, effectively and with high quality. Research skills are non-existent in the funding scheme, even though the number of doctors is extremely important for institutions to be credible when they collaborate with stakeholders and apply funding from various sources. In addition, teaching skills are non-existent in the funding scheme, even though high quality education and student satisfaction is achieved through skilled teachers.

#### IV. RESULTS AND DISCUSSION

##### A. Statistical Results

The official Education Statistics published by Statistics Finland can be used to find evidence of the effect of the performance-based funding scheme on graduation rates. At the time of this study, data for the statistical years of 2012 and 2013 were available. The reform of the new funding scheme was known several years before its implementation, because rectors and other personnel of the institutions were involved in the working groups of the Ministry. Therefore we can expect positive outcomes in these years.

Table I depicts the graduation rates of the Finnish universities of applied sciences at the bachelor's level in 2012 and 2013 using the official statistics. It can be seen that the graduation rates had increased when the situation was checked at the 4.5- and 5.5-year study marks. Both men and women improved in their graduation rates, but men improved slightly more than women. A noteworthy result is that female students have clearly higher graduation rates than male students. The results of the statistical data support the argument that the output-based state funding scheme has improved the graduation rates.

TABLE I. GRADUATION RATES OF THE UNIVERSITIES OF APPLIED SCIENCES IN 2012 AND 2013

Duration of studies	Gender	Graduation rate 2012 (%)	Graduation rate 2013 (%)
4.5 years	Men	28.0	29.4
	Women	55.8	57.1
5.5 years	Men	43.1	46.6
	Women	67.0	68.4

The new performance-based funding scheme was widely informed by managers for students and staff to improve the efficiency of processes. The evidence from the Turku University of Applied Sciences indicates that the R&D process improved such that the number of publications increased from 424 to 457 during the years 2012-2014. Also, the teaching process remarkably

improved during the same years; the share of students who achieved 55 credits annually increased from 39.9% to 49.7%, and the number of students per teacher improved from 3.0 to 3.7.

### B. Education Policy

The Finnish universities of applied sciences had an input-based funding scheme until the end of 2005. The number of students was the basis of the funding, with a pronounced difference in the disciplinary orientation such that arts education obtained the highest amount of funding. The number of students were calculated twice a year, and funding was allocated for each institution based on this calculation. The input-based funding scheme was followed within the institution based on the number of students and discipline orientation. The incentive was to increase the number of study places, because doing so brought more funding and improved job opportunities for teachers. The input model did not encourage rapid graduation, as each graduate decreased the number of students.

At the beginning of 2006, the funding system was based on both the number of students (with a weight of 70%) and the number of graduates (with a weight of 30%). The renewed system encouraged institutions to increase the number of graduates, but the output-based part of the funding was still rather small. The incentive mechanism for the performance-based funding was opened since the renewed funding scheme encouraged institutions to be more efficient and effective.

The Ministry of Education and Culture made a funding reform at the beginning of 2014. The funding is based on output measures to increase incentives for rapid graduation, employment, the Open UAS, teacher training, student satisfaction, internationalization, external R&D funding and publications. The output model also implicitly increases incentives to close down degree programs if the institution has financial difficulties. If degree programs are closed down or transferred to other institutions, the output model provides output-based funding for many years with lower costs.

The funding of the output-based model is based on floating historical data. For example, the funding for the year 2014 is based on the years 2010-2012, because the data for the year 2013 were not yet available when the funding for 2014 was budgeted. The main indicators of the new funding scheme were known some years before the reform, so that the institutions could improve their processes to achieve as much state funding as possible. The improvement of output measures over the average of institutions is required to increase the funding of the institution in the zero-sum game, because the institutions are competing with each other.

### V. CONCLUSIONS

This study analyzed the performance-based funding scheme of the Finnish universities of applied sciences. The funding scheme is an efficient tool for the steering of these institutions, because the state funding motivates them to improve performance according to the indicators

of the funding scheme. The Finnish funding scheme is more efficient than the funding schemes in many other countries, because there are no tuition fees in Finland and the state funding constitutes a remarkable share of the total funding. The performance-based funding scheme has limited the autonomy and the importance of strategic management at Finnish higher education institutions. The funding scheme has made the institutions compete with each other, because it allocates all the funding to certain institutions in a zero-sum game.

The balanced scorecard approach was used to translate the funding scheme into a strategy map, which reveals the weaknesses of the funding scheme. The analysis of the strategy map indicates that the funding scheme does not acknowledge to the research and teaching skills that are important from the perspective of the efficient and effective R&D and teaching processes. Also, the external funding of education is non-existent, leaving out activities such as continuing education and service to society. These activities are important from the perspective of outreach and engagement in regional development.

The empirical results from the Education Statistics published by Statistics Finland support the argument that the funding scheme has been able to improve the teaching processes and graduation rates at the Finnish universities of applied sciences. These results are seen in both genders, but male students' graduation rates have increased more than females'. The improvements in the R&D and teaching processes do not necessarily increase the funding of an institution, because the institutions compete with each other over the total funding, which is annually allocated to institutions according to eleven output measures.

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