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On effective investing in 21st century skills: a tentative comparison of Finnish and Russian educational economics

ABSTRACT. This article grapples with the problem of evaluation the outcomes of senior secondary school schooling in conjunction with the money invested during the schooling years. It also includes an interpretation on senior secondary schooling costs and achievements made in the light of Finnish abitur scores by using the city of Savonlinna as an example.

Schooling for the future has an important role for society's success in the international competition. Even more important is how an individual student has succeeded the senior secondary school and how much money has been spent on a graduate. Of course, money is not the only factor in this analysis.

The Finnish curriculum has also many more noble goals than just an achievement in the final abitur tests after three years' senior secondary school studies. Providing general education skills is vital for the future life of the student. The problem is that schooling does not assess those kinds of qualitative skills. So, are those general education skills simply the waste of money?

In terms of economy we can speak of so called quality-price ratio. Then we face the problem of how to predict the need of future challenges for the student. Nowadays senior secondary students will be involved in the working life almost till the end of 21st century. Then, what kind of skills will the 21st century students need and how much will the schooling cost?

As a metaphor, we can use the "slow food and fast food" approach. "Slow food" seeks for understanding and meaningful learning, but it takes more time and costs more money than "fast food", a disposable knowledge used for rote learning.

Key words: Education economics, senior secondary schools, 21st century skills, assessment, effectivity

1. Introduction and Background

Finland is one of the world's leaders in the academic performance of its secondary school students, a position it has held for the past decade. This top performance is also remarkably consistent across schools. Finnish schools seem to serve all students well, regardless of family background, socio-economic status or ability. This chapter looks at the possible factors behind this success, which include political consensus to educate all children together in a common school system; an expectation that all children can achieve at high levels, regardless of family background or regional circumstance; single-minded pursuit of teaching excellence; collective school responsibility for learners who are struggling; modest financial resources that are tightly focused on the classroom and a climate of trust between educators and the community. This chapter looks at the possible factors behind this success, which include political consensus to educate all children together in a common school system; an expectation that all children can achieve at high levels, regardless of family background or regional circumstance; single-minded pursuit of teaching excellence; collective school responsibility for learners who are struggling; modest financial resources that are tightly focused on the classroom and a climate of trust between educators and the community. (OECD 2010 report).

Most of the previous cite is easy to accept but there is no time remained to look back to the past. There is no need to be too proud of what has been already done before. Also the Finnish school is under a change. That previous success of the Finnish school position is very difficult to maintain after all the cuttings made by the present ruling policy of our new government's educational budget. It also includes the senior secondary school's funding cuts which are on a parallel line after comprehensive school achievements.

In Finland, senior secondary school studies last for three years, unlike in Russia, where senior secondary school lasts for two years. That is why the angle of the view in this article is a Finnish based considerations and the emphasis leans on economic costs. This article has been written in cooperation with vice-principal Fedor Timofeev from our partner school number 32, in Vasilyevsky Island, St Petersburg. He has given a valuable contribution to understand the Russian school system, and he evaluated our cooperation in the light of our common enterprise of sustainability

studies in high-schools. However, so far, one-to-one comparison between the cost-structure in Finnish and Russian schools is not possible to assess due to the differences in educational organizations. But alongside the cooperation we shall get a closer look at common experiences of studies and the pedagogical achievements, including the 21st century study skills and the economical effectivity considerations.

In pedagogy, the most central key is the so-called 21st century skills, i.e. skills for learning, creative and critical thinking, collaboration, and the ability to take advantage of ICT for these areas (Kankkunen 2001 and 2004; Binkley et al., 2012; Kankkunen et al., 2013). The 21st century skills are vital for 21st century citizens in terms of developing new thinking, learning and working methods and utilize information and communication technology (ICT) for being able to function in the future. This is our common goal in Finnish-Russian cooperation.

The basis for learning for understanding is to be achieved at comprehensive schools, but now both the comprehensive school and senior secondary school funded by the Finnish national government are decreasing significantly. Naturally, the Finnish municipalities can invest their own money as much as their economic ability allows to do that. Rich municipalities can provide better opportunities for students and poorly managing municipalities just try to cope with less money on schooling. The situation in Russia is the same, when school funding is also decreasing and cuts cover the whole schooling system.

"Are we going down in PISA", are all the educators asking this question in Finland and if so, who will take a responsibility if our school achievements get worse than they used to be? Finnish educators are very worried about this new trend in Finland. Both writers of this article are teachers and have had a close look of what is happening at schools in Finland and Russia. Besides, they both have experience of school administration, project management, and they are well aware of the lack of money at educational administrations. On this road there is only a deep way downhill and it is certainly a wrong way "to refresh" the economy in short and especially in a long run. Whether we want it or not, the leading principle in the future seems to be *Doing more with less (Kankkunen 2010).*

2. In search for the new road map in Finnish curriculum and Russian Learning Laboratory

> "To learn is to acquire a habit. What makes men learn? Not merely the sight of what they are accustomed to, but perpetual new experiences which throw them into a habit of tossing aside old ideas and forming new ones. (Peirce, 1976, p. 142.)"

We are fully aware of the importance of being successful with the new curriculum building process which will be implemented in August 2016 in Finland. The goals for school reforms are mostly pedagogical, trying to find new methods to meet the needs of better learning. Besides a new Finnish curriculum, Vasilyevsky Island in St Petersburg has started a new program to renew the methods of learning. That ambitious program is called "Pedagogical Laboratory" (Research program of Pedagogical Laboratory on Methodology of sustainable development for successful educational institutions, 2016). Sustainability problems are no less important for Russian educational institutions than for those of Finland. One of the most ambitious enterprises on sustainability development in Russia is Saint-Petersburg project "Pedagogical Laboratory on Methodology of

sustainable development for successful educational institutions". Pedagogical Laboratory is to provide resources for research and development of the educational institutions constituting the lab. Originally the Lab was designed to rethink traditional ways of schools development and create an innovative universal effectivity model for schools based on the sustainable development methodology (Timofeev 2015).

The main problem to be solved by the Lab is strongly connected with implementation of both traditional and new business instruments into four successful schools of Vasiliostrovsky District. Sustainability ideas are essential for the following educational issues that Russia faces today:

- Russian educators—even those who belong to the most successful educational institutions--feel urgent need for ideas and instruments to keep their institutions developing with high performance results;
- Russian school-graduates often describe their future life as uncertain and rarely associate their future with their home region.
- We need a new role-model to be implemented by schools especially by those which are falling behind, the experience of the schools implementing the sustainable development methodology might be helpful.

Both partners will benefit in doing cooperation within our common enterprise of sustainability studies (EU neighborhood program cross border cooperation CBC).

Are there any new approaches to reach new steps forward during a struggling economy of these times and *Doing more with less*? Yes, there are such steps and all of them are free of charge.

1. enhancing the theme learning, the integration studies across the subject oriented schooling, e.g. sustainability studies in high-schools, 2) developing the cooperation with schooling staff and the work community at schools, 3)a new type of assessment on learning achievements to assess the student in encouraging way to support the motivation in the studies with the emphasis on student self-assessment and social team work, 4) emphasizing the student activity to find their own learning strategy by exercising their leaning methods in a social learning environment (Vygotsky 1962).

When adding together the experiences of both writers, we have clear signs of the lack of motivation among students in both countries. One of the reasons why Russian students seem to be reluctant to be more active in schooling activities is that they are focused on the result rather than process. By the result they, as well as their parents and unfortunately local administration, mean State exam grades. The grades are the only criteria used by Universities admission commissions for enrolling students. The same grades are used by the local administration for school efficiency assessment. Students do not think they can afford "wasting" the time they need to get prepared for their State exams. The authorities are ready to use other criteria in addition to State exam grades if the new ones would be no less quantitative than the exam grades, while the former are still doomed to remain in the center. Therefore, it is the most important task to rebuild the positive attitude on schooling activities. In Finland it might be sufficient to change the student's attitude, while in Russia it would be necessary to rebuild the positive attitude to schooling activities both among the students and the local authorities. That is why we are going to use a widely organized questionnaire

on student attitudes, for a start: the process of getting the answers as an empirical evidence is not ready yet, but the participating countries cover high-school students at least in South-Eastern Finland, Saint Petersburg and the city of Detmold in Germany. The results will be analyzed in the University of Eastern Finland, at Savonlinna teachers' college by professor Kati Mäkitalo-Siegl, and in cooperation with professor Alexander Voronov, doctor Markku Kankkunen, and vice-principal Fedor Timofeev. After the analyses we are more aware of the thoughts of the youth. The accounting method we use follows the world famous principle proposed by Rom Harré and Paul Secord (1972), based on the idea to use respondents as professionals in their own field: "Why don't we ask them?"

The future challenge will be to master the teaching and learning of the students and train them on the road of learning how to learn. Following the footsteps of Harré and Secord we got to ask ourselves as educators: Who are the real professionals of their own learning? This assessment of school achievements relies on self-assessment of the high-school students and it also includes peer assessments and group discussions. This method gives solutions to solve the problem of what should be done in promoting students' motivation towards learning. The 21-st century might be the best or the highest time to get back to one of the principal ideas of John Amos Comenius – a great 17-th century educator – to prefer Mathetics to Didactics i.e to turn from the science of teaching to the science of learning. Then we have to take into account the history of the evaluation in Finland and Russia. What and for whom are the national tests for? And moreover, are those national tests effective measurements worth the money spent on them?

3. About the costs of schooling: Quality-price ratio under scrutiny, Savonlinna comprehensive and senior secondary schools case

The following analysis will show that there are challenges at Savonlinna municipality school administration. It is not due to the lazy work of school experts but because of the democratically elected members of the city council and a lack of decision maker's knowledge of education. However, they easily neglect the experiences and advice of educational professionals. But in the end, school officials bear the responsibility for poor decision making, and practical reflections on education as well.

In Finland, there is no whole-scale national tests for comprehensive schools. It is possible to get the some tests in mathematics, Finnish language and especially foreign languages.

In senior secondary school in Finland we have a long history to measure students at the end of academic studies using the abitur test. We will deal with that assessment in this article.

4. An attempt to develop the equal treatment among the students, cost comparison among the comprehensive schools in Savonlinna and the Russian finance model

In the bigger and economically effective comprehensive schools we have one teacher per 21 students. In the most expensive school units that ratio is one teacher per 10-11 students. Yes, one

has to admit that the geography of Savonlinna is very complicated. Savonlinna is 2000 square kilometer in size, which is almost twice as big as Moscow, and we have long school distances in rural areas to get the suburban schools. However, school trips are free for the families. After all, this quality-price ratio is not equal for all students.

Russian schools are financed according to quite a complex scheme depending on the school status, region and a number of students. This model is provided by the Ministry of Education of Russia (2006).

C = C(ss) + C(b) + C(k), where:

C(ss) – state standard costs which depend on regional per capita standard (the density of population in Russia differs greatly from one region to another so each region has its own standard), number of school students; C(ss) = N x U x S, where:

N – per capita regional standard;

U – a school updated coefficient;

S – number of students.

C(b) – specific costs that were not taken into account in F(ss) such as students transportation, school building maintenance etc.;

C(k) – specific costs that were not taken into account nor in F(ss), neither in F(b).

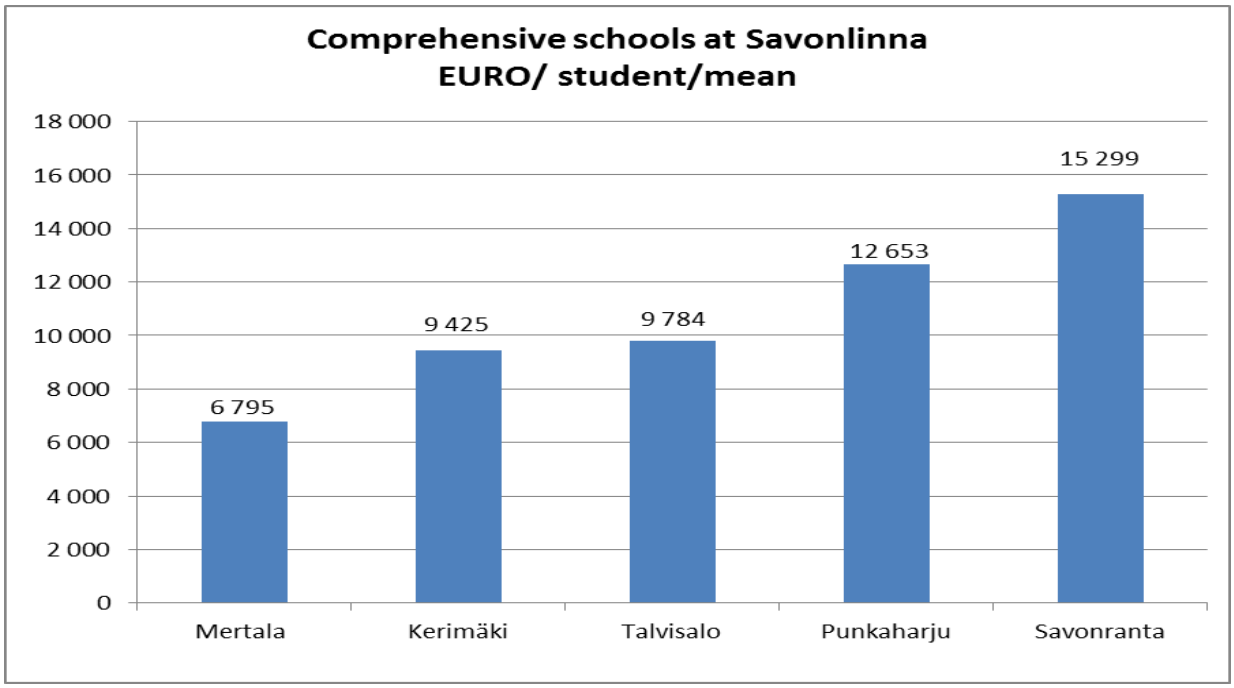

Figure 1: Costs per student at Savonlinna comprehensive schools (Talvisalo school at a center of town also has 8 special education groups, max 12 students per group, dropping down the effectivity, but with a good reason)

4.1.Cost comparison among the senior secondary school students

The following Figure 2 shows that there are huge differences on costs between the senior secondary school units in Savonlinna during 2015-2016 school year. The differences in costs correlate with the number of students in a certain school unit. Our town council accepted (still after voting) to quit the suburban school unit number 2 after a strong struggle. As it can be seen, its costs are too high for the richest municipalities in Finland, not to mention our town of Savonlinna which is already taxing the citizens by the highest rate of 22,5% in municipality taxes in Finland. After that the national taxes come, which easily double the income tax for a taxpayer. This situation is unbearable. What is equality in this case in connection with quality-price ratio? I also proposed to shut down the unit number 1 but it still keeps going during the coming year with the estimated 48 students. It means that the cost per student will rise in that unit.

Figure 3 demonstrates the costs after the scores in national abitur tests. They are the facts concerning the quality-price ratio. The average cost for a senior secondary school student in Finland is 7573 euros (Finnish Statistic Center in 2014). It shows that our "bigger" high-schools are well under the Finnish average and the small units are very expensive with all the indicators of costs and effectivity. In the light of the facts we should unite the schooling units but after that comes in the politics to have nothing to do with facts but defending the school network as it has always been in suburban areas. This leads to the situation - both in comprehensive and senior secondary schools - when we have to cut from bigger units in favour of the small ones.

1. Academic results and quality-price ratio

About 150 years old national Abitur-test (final exam) will finish the senior secondary school studies in Finland. Simply put, it is compulsory for a student to pass at least 4 subjects which the student is attending. Many of the students take more subjects on their test package with the average amount of test subjects between 5 to 6. Usually, this kind of nation-wide testing for all students is very rare in Finland.

	budjet	students	cost/student	compared to Mean
suburban unit 1	491 501,00 €	53	9 273,60 €	116 %
suburban unit 2	510 156,00 €	21	24 293,14 €	304 %
Lyceum	2 476 387,00 €	341	7 262,13 €	91 %
Art high-school	2 008 954,00 €	272	7 385,86 €	92 %
all high-schools	5 486 998,00 €	687	7 986,90 €	100 %

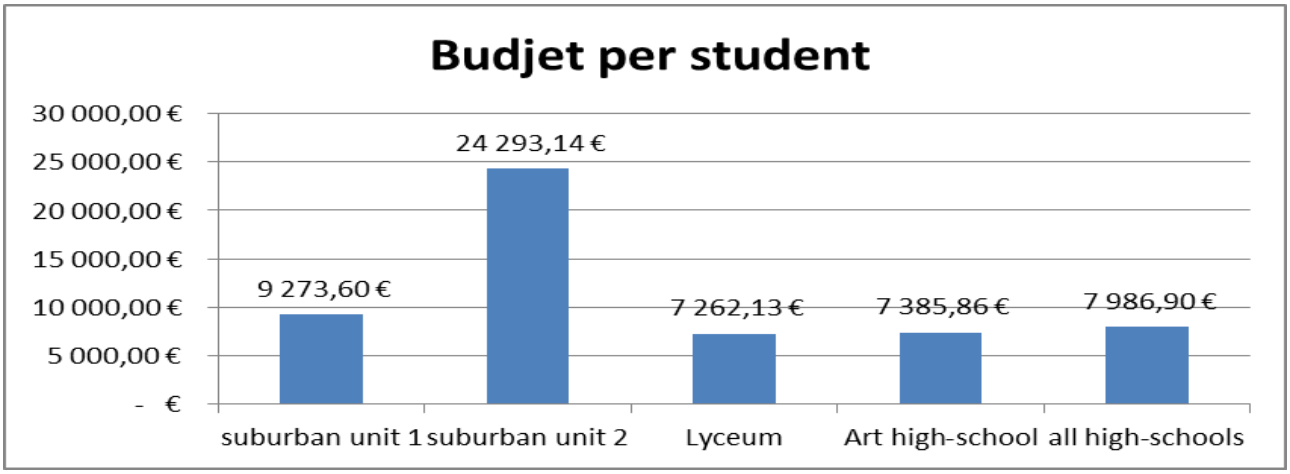

Figure 2: Costs per student at Savonlinna senior secondary schools

Figure 3. Costs per student in senior secondary schools.

In Russia, nation-wide tests are being used in a large scale. In 2009, after nearly a ten year period of experiments, the Unified State Exam became the only form of graduation examinations in schools and the main criteria for admission to universities all over Russia. There are two mandatory exams – Russian language and Mathematics. Also Russian students may take some other USE, depending on the subjects they might need in case they decide to go on studies. They chose from the following: Foreign languages (English, German, French, Spanish and Chinese (since 2016)), Physics, Chemistry, Biology, Geography, Literature, History, Computing science and basics of Social studies. The exams in each subject are taken simultaneously all over the country in accordance with the time zones. The exams are assessed by teams of specially trained independent experts; students' names are coded so that the assessors do not know whose test they evaluate. In Finland the national tests are organized by the Matriculation Examination Board. The evaluation of the Abitur tests are made by university teachers. Marks and scores will be given as follows:

Marks in Latin	Score	Meaning	Amount %
laudatur	7	excellent	5 %
eximia cum laude approbatur	6	praiseworthy	15 %
magna cum laude approbatur	5	good	20 %
cum laude approbatur	4	satisfactory	24 %
lubenter approbatur	3	fair	20 %
approbatur	2	passable	11 %
improbatur	0	abandoned	5 %

TABLE 1: The assessment of the Finnish Abitur-test (final exam after the senior secondary studies)

After the Abitur-tests the scores of students will be added together and the mean of the results will be calculated. During the academic year 2015-2016 the average score in all Savonlinna high-school units was 3,91, and in the whole country the result was 4,22. There are small differences in scores in the whole country and between Savonlinna units with no statistically significant differences.

On the other hand, there are big differences in quality-price ratio in costs per student score in Savonlinna, as can be seen in Figure 3.

After all, the Abitur-test needs a lot of work in Finnish schools, and it is also a very expensive test. Its importance is highly overvalued because new tests are awaiting most of the students who are applying the university just after finishing the Abitur.

In that perspective, the Russian way does not differ greatly. Unified State Exams, that senior secondary school students take in Russia, are also extremely expensive, time and effort consuming, as well as subjected to criticism among the educational community and the Russian society in general. A lot has been done by Russian Federation Ministry of Education through mass media to create a more positive attitude towards State Exams. The situation is getting better: the 2015 polls show [WCIOM, 2013,2016] that 80% of Russian teachers who work in senior secondary school and 62% of senior secondary school students trust the State Exams as relevant, that is 53% higher than in 2013. There is still a lot to be done, and the sustainability studies we are discussing, might well be of some help.

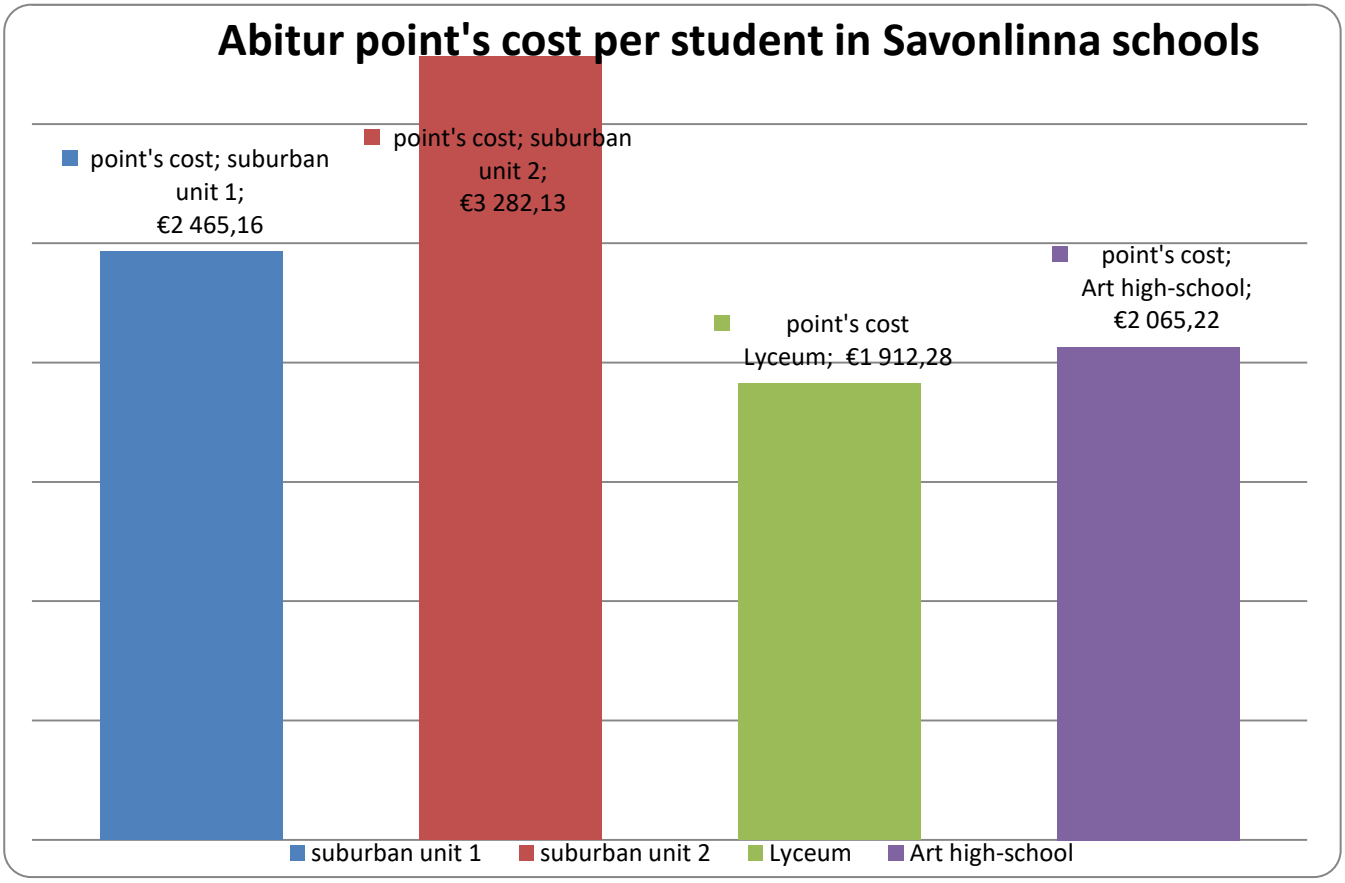

Figure 3. Abitur point's cost effectivity in Savonlinna senior secondary schools.

2. Conclusions

Our attempt to develop sustainability studies is heavily reliant on cooperation with Russian partners, partner schools and State University of Economics staff. Each step taken in this direction should help educational systems in both countries meet the challenges of the time. Its goals are also dealing with effectivity on economic aspects and with the quality of good teaching and learning. The authors believe that later on we will able to improve our access to find a balanced framework to compare the costs between Finnish and Russian schooling.

Still our main concern in both countries is to demonstrate that education is the most important task of the mankind. The results of education come up slowly but through cooperation we can reach more national and international credibility on teaching and learning outcomes. Our next common goal will be to join our efforts to get the EU-funding money so that we can design both educational and financial innovations.

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