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PPMi

Impact evaluation of EU funds investments in the areas of education and R&D&I under Lithuania's Operational Programme 2014–2020

Executive summary

The Ministry of Education, Science and Sports of the Republic of Lithuania (hereinafter – the Ministry) has initiated an impact evaluation of two priorities, namely “Promotion of research, experimental development and innovation” and “Public education and development of human resource potential” that have been implemented under 2014–2020 Operational Programme (hereinafter – OP) for the European Union Funds Investments in Lithuania. This **evaluation aims** to assess the progress and impact of the abovementioned priorities in areas of education and research, development and innovation within the goals and specific tasks set in the OP. The evaluation will assist the Ministry of Education, Science and Sports and other responsible bodies to improve EU investment, communicate and report outcomes of funding period 2014–2020 to the society and the European Commission, as well as to prepare for the next funding period of 2021–2027 more effectively. The evaluation is relevant and intended for representatives of institutions that are administering EU funds investment, formulating and implementing education and R&D&I policies, as well as other stakeholders.

Our evaluation approach was based on the **theory of change** to determine causal links among policy intervention, expected outcomes, and potential impact. The following **methods** were used:

- desk research, analysis of monitoring and administrative data;
- analysis of 2017 and 2019 National Pupil’s Achievement Testing (NMPP) and Secondary Education Achievement Testing (PUPP) results, both provided by a Lithuanian National Agency for Education (hereinafter – NAE);
- interviews with representatives of institutions responsible for the implementation of EU funds investment, project managers and beneficiaries;
- surveys of applicants, beneficiaries and partners;
- case studies.

The evaluation results of the expected impact of EU funds investment within the period of 2014-2020 in the field of education and research demonstrate that planned and implemented interventions mostly address the challenges identified in the Operational Programme, contribute to planned changes and directly feed into monitoring indicators, which have been established at OP level. However, some challenges and aims, reflected in Lithuanian strategic documents, call for additional actions and means to improve the quality and accessibility of education at all levels, as well as science-business cooperation and knowledge commercialisation.

The biggest share of EU investments was made towards infrastructure within both, R&D&I and education, sectors. The main focus was on modernisation and development of infrastructure, provision of necessary equipment, development of systematic preconditions for increasing the quality and accessibility of education, including the establishment of the management, monitoring, and evaluation systems at different educational levels, as well as development and update of educational programmes. The majority of these improvements are still in progress, therefore, the impact of their created products and results will become evident over a longer period. In the meantime, the investments bringing change at institutional, target group, and individual levels were remarkably limited, with a few exceptions of non-formal education funding and public sector researchers' competence building schemes.

Impact of EU investment on early childhood, pre-primary, primary, secondary and non-formal children education

As demonstrated by the impact evaluation, EU investment in the infrastructure of early childhood, pre-primary, primary, secondary, and non-formal children education institutions is highly relevant to strategic goals. The progress of EU funds interventions in this investment area suggests that planned products and results will be achieved despite the postponed launching date and/or delay of implementation of some investment projects. The analysis of EU investment impact on the efficiency of educational institutions' network demonstrates that:

- 2014–2020 EU investment in the infrastructure of early childhood education institutions improves the educational environment for only approximately 10% of all children participating in early childhood and pre-primary education; despite this significant contribution, the actual impact will be smaller than the initially planned;
- appropriate planning of state projects and accurate development of criteria for regional projects for investing in modernisation of general education institutions have created preconditions for sustainable investments, which are in line with the optimisation scheme of educational institutions, and whose direct impact will reach at least 14% of all pupils across the educational sector;
- investments in the infrastructure of general education institutions enabled them to adjust it according to early childhood and pre-primary education service provision requirements. This development increased accessibility of these services in seven district municipalities, thus making efficient use of the present educational infrastructure;
- centralised implementation of NAE projects, which provide educational institutions with school buses, science and technology equipment, technical assistance facilities for children with special needs, will complement and strengthen the EU investment impact on educational institutions' infrastructure, providing an opportunity to further increase the efficiency of the school network, as well as quality and accessibility of education;
- EU investments in the infrastructure of non-formal children education have improved educational environment and increased infrastructural capacity, which creates favourable conditions to extend the accessibility of non-formal education, especially in the regions;
- high funding intensity of investments in the infrastructure and environmental improvement of private general educational institutions has potentially prevented private investments and made an insignificant contribution to increasing the efficiency of the school network.

The majority of investments aimed at the development of institutional capacities of early childhood and pre-primary educational institutions were assigned for projects in Vilnius and Klaipėda district municipalities. The projects aimed to reduce school places shortage and increase the accessibility of early childhood education for residents in large cities. As the majority of investments were assigned in addressing the issues in the cities, the investments did not address an issue of a rural-urban gap and SEC status effects on children enrolment in early childhood and pre-school education during the 2014-2020 EU investment period.

1st recommendation

To: the Ministry of Education, Science, and Sports of the Republic of Lithuania

Implementation period: 2021–2027

Taking into account the benefits and impact of participation in early childhood and pre-school education on pupils' general education achievements, it would be appropriate to increase participation in early childhood education in rural areas by ensuring the availability and accessibility (educational institutions close to home) of early childhood education services and thus increasing the demand for early childhood education during the upcoming 2021–2027 EU funding period.

Proposed targeted change: double the participation of children in early childhood education in rural areas.

Form of funding: subsidy

Investments in the preparation or customisation of premises for early childhood education (nursery and early childhood education groups) in educational, cultural and / or multifunctional buildings should be combined with funding for the provision of early childhood education services to children at risk of poverty and social exclusion, as well as with regulatory measures, which are dedicated to advance the participation in compulsory early childhood education. It is proposed that in the 2021-2027 funding period, a set of measures to achieve the targeted change would include:

- 1) a universal obligation and / or strong financial incentives for parents to enrol their child at educational institutions providing early childhood education; early childhood education services and meals in early childhood education for children from low-income families and in rural areas must be free of charge;
- 2) financial incentives to provide early childhood education services in rural areas: the services could be organized in municipal institutions or by private service providers'. Appointed teachers would come daily to rural areas to organise early childhood and pre-school education for small groups of children in general education institutions, multifunctional and cultural centres and other suitable premises;
- 3) to provide regions and rural areas general education teachers, who have only part-time workload, with opportunities to acquire the necessary qualifications for early childhood education, so they could be involved in the provision of early childhood and pre-school education services (see the above-provided point 2).

Additional EU investment may be needed to strengthen municipal institutions in district centres to recruit more teachers, provide themselves with transport and methodological tools, as well as to act as managerial and methodological centres for the organisation of early childhood and pre-school education in rural areas.

Another challenge, which will remain relevant in the new programming period, is the accessibility for pupils to use the laboratories in their schools. Although all Lithuanian schools will have access to use the laboratories of the regional STEAM centres, this investment project does not contribute to the strategic goal of significantly increasing the share of students who have access to the science laboratory in their school to 80% of all pupils. To improve student achievements, it is important to provide schools with laboratory equipment in the next funding period 2021–2027, ensuring that students have daily access to it in their learning process.

The impact evaluation indicates that the measures, mainly contributing to the quality and accessibility of early childhood, pre-school, general, and non-formal education, were:

- systematic improvement of qualifications and strengthening of competencies of teachers, educational specialists and other educational institutions employees;
- introduction, development, and testing of new forms and ways of the educational process at *educational institution level*;
- preparation of recommendations, methodologies and teaching practices for educational institutions and teachers;
- direct financing of non-formal education services using the “basket model”, which allowed to increase participation in non-formal education activities from 28% to 60% and to increase the variety of supply and diversity of non-formal education services (especially in regions and rural areas).

The other systematic-level interventions, aimed at updating the general education curricula, developing and implementing educational organisation models, developing education monitoring and evaluation systems act as necessary preconditions for a successful implementation of changes in the education system. Although the “quality basket” model aimed at introducing results-oriented funding compensation is an important change at the education system level, its actual impact will depend on the motivation of municipalities and schools to improve their performance and achieve better results. Another challenge, hindering the development of the Lithuanian educational system, is a stagnant reform of teacher training institutions and a low level of teacher career attractiveness.

Although the interventions, implemented during the 2014 – 2020 funding period focus on changes of quality and accessibility at different levels of general education management: systemic, institutional, and individual in improving teacher competences, they do not include targeted, pupil-centred measures to improve educational performance.

2nd recommendation

To: the Ministry of Education, Science, and Sports of the Republic of Lithuania

Implementation period: 2021–2027

To address the challenges of inequalities in terms of education quality and accessibility, in line with the European Child Guarantee initiative, during 2021–2027 funding period, a targeted (pilot) intervention could be implemented in selected schools that would provide funding for quality full-time education for pupils in grades 2 to 7.

Proposed targeted change: reduce the number of students who do not achieve Level 2 in reading, mathematics, and science in PISA

Form of funding: subsidy

This intervention could be implemented at a standardised cost of education services for:

- additional teachers’ salaries;
- transport costs;
- learning means and equipment;
- pupils’ meals.

Consistent and regular assessment, monitoring, and analysis of student performance must be implemented

to evaluate progress and measure change.

Moreover, to ensure the continuity of the results of 2014–2020 EU investments in the development of non-formal education, it is necessary to establish a sustainable non-formal education funding model, to strive for increasing the coverage, quality, and orientation of non-formal education towards the development of professional competences.

Impact of EU investment on higher education

2014 – 2020 EU investments in the area of quality and accessibility of higher education were directly influenced by the 17th Government's structural education reform, which aims to optimise the universities network, improvement of educational quality, and increase of the prestige of researchers' career to:

- create preconditions for improved quality of higher education and studies;
- formulate, direct and steer education to match labour market needs;
- increase the attractiveness and prestige of academic and researcher career;
- reorganise the network of public universities and optimise higher education infrastructure.

Despite the ambitious goals, the implementation of the reform was limited by the weak coordination of the university network optimization process, including the process of merging universities, and the lack of regulatory and administrative measures to implement the University Network Optimization Plan.

Implementing the University Network Restructuring Plan, the investments in study infrastructure should have primarily contributed to the concentration and improvement of studies' (universities) projects. However, the projects selected and implemented through the state project planning process currently also include improvement of infrastructure of universities of applied sciences. It should be noted that the educational infrastructure capacity of eight universities and nine universities of applied sciences that received the planned investments accounted for more than 40% of all higher education students in the 2019–2020 academic year. Therefore, it can be stated that significant investments in the improvement of the study environment create conditions for achieving the goals of study quality improvement in the study institutions, which attract a significant part of students and has the greatest potential. However, the declining number of students in upper secondary education and a steadily declining number of students at universities and universities of applied sciences pose risks to the sustainability of investment in study infrastructure.

To improve the quality of studies and their match with the labour market needs, the following project inputs, which contribute to changes and create their preconditions, are planned at the systemic level:

- to prepare and update the documents, regulating the study process: updated the methodology for preparing the descriptions of different educational study levels, designed and/or prepared descriptions of study fields or their groups
- to update the methodology for creating descriptions of study fields for different levels, prepare and/or update the descriptions of study fields or their thematic groups;
- to enhance the external quality control system of higher education institutions: update methodology of external performance evaluation; implement external evaluations of higher education institutions' activities and study programmes/fields;

- to develop a system of academic recognition of foreign qualifications related to higher education.

To increase the accessibility of studies and their match with the labour market needs, the state, and individual higher education institutions have also implemented projects, which aim to:

- improve access to studies for students from socially vulnerable, socially excluded and under-represented groups through a targeted allowance or social scholarships;
- to adapt the information and physical study environment for persons with special educational needs;
- facilitate the process of student internships in companies and organisations;
- promote student entrepreneurship;
- engage professors and students of higher education institutions in non-formal education programmes.

The evaluation demonstrates that these projects are likely to have a positive impact on the individual level of those people who were involved in the project activities, but the coverage and scale of interventions were relatively small.

To increase the international presence and the attractiveness of Lithuanian higher education for foreign students, 44 presentations introducing Lithuanian higher education were organized in foreign countries. Meanwhile, the share of foreign students studying at universities and colleges reached 7.56% and significantly exceeded the level of initially planned change.

Studies at Lithuanian higher education institutions have also become more international: 1,588 of previously estimated 3,600 students studied in foreign higher education institutions during their study period. However, the evaluation revealed that due to the complex document declaration process, inflexible conditions, and complex administrative activities within the frames of projects supported by EU funds, higher education institutions tend to declare their expenditure and costs to the European Commission instead of ESF-funded project.

1st strategic proposal

The information gathered during the evaluation shows that to further optimise the network of higher education institutions and **increase the quality and accessibility of studies**, it is necessary to:

- effectively coordinate the implementation of the university network transformation;
- implement changes at pre-primary and general education levels, reducing inequalities in performance and negative impact on students with lower SEC status and those from vulnerable societal groups to study at higher education institutions.

To improve the quality of studies and their match with labour market needs, during the 2021–2027 financial period, it is recommended to apply a competitive funding scheme for higher education institutions' projects that aim to adapt and employ innovative, student-centred teaching methods in the study process.

Impact of EU investment on capacity building of public sector researchers

The measures implemented in the 2014–2020 investment period effectively contribute to the development and strengthening of public sector researchers' competences and address the central issues within the area. The implemented measures ensure the consistent development of scientific competencies and their subsequent strengthening at all stages of researchers' careers (improving students' abilities, expanding and improving doctoral study programmes, developing and building the competencies of academic scientists and researchers).

Survey results demonstrate that EU investment significantly contributes to improving researchers' competences and strengthening the international dimension of Lithuanian science. Researchers and scientists who were not provided with the EU funding for their projects were less engaged in international scientific activities (articles in international peer-reviewed scientific journals, internships, applications for international projects). Meanwhile, the ones who have experienced the intervention under the Operational Programme have become more involved in the exchange of scientific ideas, networking activities and actively took part in high-level international scientific projects. The international experience contributed to the submission of articles for international peer-reviewed journals.

Despite the significant impact of EU investment in strengthening the capacity of public sector researchers, the evaluation has shown that the following factors need to be taken into account to invest more effectively in the development of researchers' and scientists' competences:

- **low salaries** reduce motivation and willingness to get employed and continue the professional path in the scientific area, as well as decrease the attractiveness of researcher and scientist occupation; small salaries **hinder from recruiting** researchers and scientists from abroad (including Lithuanians who have left and are studying abroad).
- to reduce the time resources needed for the administrative tasks of the project, it is necessary to provide the most effective administrative and managerial assistance to scientists in research and study institutions (hereinafter – RSI), as well as to strengthen the managerial competences of staff in institutions that administrate EU interventions.
- increased flexibility to implement the activities that were not planned and documented in project funding applications would allow a greater possibility for breakthrough innovations and other scientific advances. In the area of R&D&I, the researchers and scientists should be enabled to take risks and experiment, as it leads to the development of new knowledge, products, processes, and mechanisms.

Impact of EU investment on vocational and adult education

ESF investments in the area of vocational and adult education were directed towards increasing their attractiveness and matching the labour market needs. The implemented actions include the development of a qualification and competence recognition system, an update of the modular vocational training system, and an introduction of new interactive e-learning tools. It should be noted that investments, which aim to increase the scope and coverage of adult learning, are highly fragmented. The interventions of the 2014–2020 period by the Ministry have only covered specific target groups (socially vulnerable people, those with no secondary education, employees of educational institutions, (vocational) teachers, health workers).

2nd strategic proposal

Given the context, the project “Have a profession - have a future!”, which has been implemented during the 2014–2020 funding period, is particularly relevant. 10 vocational training institutions take part in this project, which aims to create favourable learning conditions, improve teachers' qualifications, provide different services (learning assistance, extracurricular groups, introduction to the labour market). Within the frames of the project, 300 students from socially vulnerable groups, as well as to 2,000 teachers and other employees will improve their qualifications. The outcomes of the project will strengthen the capacity of the VET system and make a positive change in pursuing a more inclusive VET.

To increase the impact of similar interventions, improve attractiveness and accessibility of vocational training for students from socially vulnerable groups, as well as reduce their drop-out rate, a performance-based scholarship could supplement the current educational services.

Other investments in the area of adult participation in formal and non-formal education aim to improve the general and specific competencies of general education teachers, develop a culture of quality and leadership within the general education sector, strengthen the technological competences of vocational teachers and improve the qualifications and skills of doctors. However, to manage the risk of overcapacity in vocational and adult learning infrastructure, it is necessary to find effective ways to stimulate demand for lifelong learning activities, including funding for adult learning through a model of individual learning accounts.

3rd recommendation

To: the Ministry of Education, Science, and Sports of the Republic of Lithuania

Implementation period: 2021–2027

To increase the participation of adults in LLL, it is proposed to consider two types of interventions supported by EU funds (a form of financing – subsidy):

- 1) **large-scale initiatives** to involve as many people as possible and thus promote learning. AI training held in Finland could act as an example of good practice (see section 6.2 of the report) for this type of intervention; a relatively small sum of funding for learning activities could provide learners with incentives to explore different types of learning programmes;
- 2) **targeted interventions** that are focused on professional mobility or higher value-added occupations. It is important to assure the accessibility of monitoring data to further assess the impact of the targeted interventions. Targeted interventions may be subject to indicative fixing rates.

Impact of EU investment on science and business cooperation and knowledge commercialisation

The analysis of the impact of the measures implemented within the frames of the OP on science and business cooperation and knowledge commercialisation area demonstrates that the Lithuanian R&D&I system, and especially R&D&I infrastructure, remains strongly dependent on EU investments, therefore systematic changes must be made to increase the sustainability of achieved results. The measures of the 2014–2020 programming period have made a limited contribution to R&D&I infrastructure usage and exploitation, as well as to the attraction of external users from economic entities, as the majority of the funds administered by the Ministry was allocated towards R&D&I infrastructure development, renewal and integration into international networks.

However, some of the implemented activities have the potential to strengthen the capacity of the Lithuanian R&D&I system and to foster cooperation with business and the commercialisation of knowledge.

The change of ecosystem's participants' behaviour is proved by several activities within the OP frames: the development of links between RSI and business enterprises, the plans for attracting private R&D&I funding, the development of international, intersectoral, and interdisciplinary partnerships and cooperation with business enterprises, the establishment of spin-off companies and tested technologies in the production process.

The evaluation shows that the most effective measure in terms of the objectives pursued was measure no. 703 (innovation and technology transfer centres), which aims to strengthen the capacity and expand the activities of research and study institution units that implement innovation and technology transfer functions. Other measures either have limited progress, which does not yet allow the effectiveness of the measure to be assessed (such as measure 702, focused on the projects for idea commercialisation and international EUREKA projects), or their potential impact on specific objectives is limited. The ratio of the planned results and allocated investments in this area shows that it is necessary to expand the usage of R&D&I infrastructure, researcher cooperation, and knowledge commercialisation during the planning and selection process of projects supported under Priority 1 of the OP.

To make a substantial change, additional measures to address the behavioural changes of R&D&I ecosystem actors (RSI, businesses, public and private sector researchers) are required. To exploit the potential of the created public R&D&I infrastructure, achieve the long-term impact and benefit from the public investment, it is important to promote the commercialisation of public sector R&D&I results, cooperation between science and business, and creation of innovation ecosystems¹.

4th recommendation

To: the Ministry of Education, Science, and Sports of the Republic of Lithuania

Implementation period: 2021–2027

Increasing the scope of knowledge commercialisation of RSI requires systemic and organisational incentives to change the behaviour of RSI and public sector researchers:

- **systemic incentives**, which include the broad co-financing (e.g. 50%) of attracted private or EU framework programme investments in RSI, and abolished wage ceiling for researchers working on these projects;
- **organisational incentives** to develop commercialisation culture in RSI by widely funding activities at different stages of the commercialisation cycle (a form of funding – subsidy; application of fixed rates):
 - o inventory of knowledge/know-how;
 - o approval of concept;
 - o layout/model testing and verification;

¹ Paliokaitė, A, Gonzalez Verdesoto, E; Research and Innovation Observatory (RIO) 2016 country report. Lithuania; EUR 28492 LT; DOI:10.2760/38295. Paliokaitė A.; Petraitė M. and Gonzalez Verdesoto E, RIO Country Report 2017: Lithuania, EUR 29159 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-81214-9, DOI:10.2760/11127, JRC111273.

- registration of patent applications;
- prototyping;
- actual commercialisation in cooperation with foreign or Lithuanian business enterprises.
- **individual incentives** for researchers to commercialise knowledge resulting from systemic and organizational incentives.

Funding for knowledge commercialisation should be regular and based on steady requirements, such as:

- two calls per year for public sector researchers to apply for funding for applied research and pre-commercialisation activities;
- at least 40% of the funding sum under the application must be targeted at pre-commercialisation activities:
 - novelty assessment, analysis of intellectual property rights and other contextual conditions;
 - assessment of the research idea from a commercial perspective (proof of relevance);
 - market and consumer research, consumer value assessment;
 - competing solutions/innovations analysis;
 - proof of concept;
 - financing model and potential investors analysis;
 - business model analysis;
 - idea protection (property rights) / registration of patent applications;
 - commercialisation and entrepreneurship training.
- the implementing institution may organise additional activities aimed at promoting commercialisation, such as events for researchers and investors, presentations for spreading news about ongoing projects, increasing awareness using media channels, or specialised platforms to attract the attention of potential investors.

3rd strategic proposal

To **increase the cooperation between science and business sectors**, in addition to pre-commercialisation activities, the implementation of joint research and business R&D&I activities may be supported, or research that is relevant for business may be promoted:

- support for open innovation initiatives, e.g. development of research programmes under which RSI receives funding to carry out R&D&I activities to meet business innovation needs; however, in this case, the presence of business enterprises that benefit from R&D&I activities is a necessary condition
- support the cooperation of RSI and businesses with R&D&I capacity within the R&D&I area by **providing funding in two phases**:
 - 1) research group/team formation, research question formulation, networking activities;
 - 2) implementation of joint RSI and business enterprises R&D&I activities.