EUROPEAN UNION
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OPERATIONAL PROGRAMME
SCIENCE AND EDUCATION
FOR SMART GROWTH

Reimbursable Advisory Services Agreement on Public Expenditure Review in Science, Technology and Innovation and Support for Building Evidence-based Approach for the National Strategic Framework in Education 2030

PILLAR 2: Support for Building an Evidence-Based Approach for the National Strategic Framework in Education 2030

Assessment and Recommendations on the Learning Environments in Preschool, General Schools and Vocational Schools in Bulgaria

September 30, 2020

BG05M2OP001-4.001-0008 "Provision of information and publicity activities of the Operational Programme Science and Education for Smart Growth, evaluations and studies of Operational Programme Science and Education for Smart Growth and preparation for the next programming period" under priority axis 4 "Technical Assistance" of the Operational Programme Science and Education for Smart Growth"

WORLD BANK GROUP

Learning Environments in Bulgaria

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ACKNOWLEDGEMENTS

This report was produced by a core team led by Husein Abdul-Hamid (Senior Education Specialist, Task Team Leader) and Dessislava Kuznetsova (Education Specialist, Co-Task Team Leader), Maria Ustinova (Education Consultant, HECED), Syedah Aroob Iqbal (Consultant), Kristina Nikolova (Consultant), and Borislav Zlatkov (Consultant). The analysis benefitted from background reviews by Velizar Stefanov (Consultant). Adela Delcheva (Operations Assistant) provided administrative support.
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List of abbreviations

ECEC	Early Childhood Education and Care
ESF	European Social Fund
GE	General Education
LE	Learning Environment
LEEP	Learning Environments Evaluation Platform
MOES	Ministry of Education and Science
NPDE	National Program for Development of Education
OECD	Organization for Economic Co-operation and Development
OP	Operational Programme
OPSESG	Operational Programme Science and Innovation for Smart Growth
PIRLS	Programme for International Reading and Literacy Study
PISA	Programme for International Student Assessment
VET	Vocational Education and Training
UNSDGs	United Nations Sustainable Development Goals (SDGs)

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Executive Summary

This analytical report is the first output under the Reimbursable Advisory Services Agreement signed between the Ministry of Education and Science of the Republic of Bulgaria, the Executive Agency “Operational Programme “Science and Education for Smart Growth”, and the International Bank for Reconstruction and Development (the World Bank) in providing advisory services on Public Expenditure Review in Science, Technology and Innovation and Support for Building Evidence-based Approach for the National Strategic Framework in Education 2030, PILLAR 2: Support for Building an Evidence-Based Approach for the National Strategic Framework in Education 2030. The project became effective on June 10, 2020. The report presents the first deliverable of the advisory work under Pillar 2, Componen1, Activity 1.3 of the Agreement - a report assessing the physical environment (structural quality) of preschools, general schools and VET schools based on a needs assessment of their educational environment, which will reflect the demographic profile, migration processes and economic needs at municipal level.

In Bulgaria, learning environment (LE) is not equally developed amongst schools and preschools and there are differences between regions. The country is lagging OECD countries when compared to an infrastructure that is supportive to learning. According to PISA 2018, the students from all socio-economic quintiles experience the challenges in accessing high quality learning environments. soc. The disparities between schools and regions are explained by policy developments and education sector-specific investment practices addressing LE. This finding is supported by the fact that the distribution of poor infrastructure is similar between learning outcomes groups where low achievers are exposed to comparative levels of poor LE as the students with high level education attainments.

MOES has collected rich data on renovations and capital investments in schools and preschools as of September 2020. Still it is unclear, whether there is a new conceptual approach to renovations applied that addresses interactive learning. There is a need for new investment in infrastructure, as shared by the principals, to better focus on modernized classrooms and learning spaces. It is unclear also if there is a common base for direct LE concept that informs and addresses learning and how far the assessment for poor environment and needs by the principals is comparable to a minimum standard at the national level. Information on common conceptual approaches and outcomes on LE is not present.

Following the review of international and local data sets, ESF investment policies trends and national planning documents, a list of discussion questions, recommendations and specific proposals for next steps concerning LE are outlined below.

Learning environment standards and concepts: general recommendations for national policy

In order to facilitate the development of contemporary LE, supportive to learning goals and child development it is important to focus the national policy on the following aspects:

- Targeting the investments towards the creation of LE that have direct connection with the pedagogical approach and are better suited to the needs of students and teachers, as well as the local community. This will help improve the quality of the educational facilities and provide an opportunity to use the funds, allocated to innovations more efficiently.

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- According to PISA 2018, 1 in 3 students in Bulgaria studied in a school that faced a lack of physical infrastructure; 1 in 5 students studied in a school with inadequate or poor-quality physical infrastructure. Despite of current investments, the quality of educational infrastructure, including DLE remains a key issue for the education system, as identified by the school principals. The MOES should consider conducting the analysis of the barriers for the educational institutions to assess relevant investments. One third of the students is dissatisfied with the existing LE. Therefore, special actions are needed (self-assessments/LE audit, supporting programs for LE development, teachers' training on LE usage) to integrate LE, teaching methods and reality in the existing classrooms.

- Joining the international dialogue on LE developments in order to collect best international knowledge, but at the same time to promote the national practices. Regular participation in the OECD Group of National Experts on Effective Learning Environments (GNEELE) could become a platform for such exchange and level for policy developments addressing learning.

- Revising and optimizing the existing sanitary, construction and fire-protection standards, which regulate the creation and maintenance of educational facilities, in order to (i) integrate specifically education needs and approaches, learning environment development ideas with construction and engineering technologies; (ii) address policy targets and more specifically the new policy goal to ensure equal access to quality learning spaces for all four year old children. It will be important MOES to stimulate and lead an inter-agency dialog on this topic to bridge ideas, needs, planning and fundraising approaches in order to build a continue of practices that build upon the existing decentralized approach for LE decision and management.

- Guided by policy targets addressed by Education Strategy 2030 (21st century skills, competence based learning, green concepts, citizenship and participation) to develop and provide guidelines to a broad scope of stakeholders addressing learning environment - the national design and education professionals, policy officers, experts on construction and rehabilitation of educational buildings, investments agencies responsible for capital investments. To promote contemporary approaches and international best practice.

- A challenging task is to create and manage a task force to coordinate the efforts of different agencies in developing high-quality educational facilities. MOES could start exploring subjects and activities that gain support and are of common interest for the variety of stakeholders addressing investments in learning environments.

- Data on Bulgaria indicates that policy developments and investments decisions significantly impact on the access to high quality educational infrastructure more than socio-economic factors. Overall, the approach to LE is not focused on policy coordination and monitoring of outcomes, but integrated in decentralized decision making. MOES could address LE disparities by developing policies, which stimulate education institutions to plan and conceptualize learning environments. To achieve this aim, the MOES could establish LE profiles for educational institutions and integrate planned investments with the needs, as well as learning and teaching concepts for each profile group. In order to support the development of coordinated policy measures, the WB team suggested five LE typologies based on MOES data collection: i) Group 1 – No renovations/investments; ii) Group 2 – Buildings only; iii) Group 3 – DLE facilities only; iv) Group 4 – DLE

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scope; v) Group 5 – No information. The WB team will follow up with holding a brainstorming session to discuss and validate a potential development of this approach. Please check Next Steps section below.

- Impact of renovations to learning environment on preschool, general education and VET could not be analyzed due to data limitations. WB stands ready to continue the work on that topic by applying additional questionnaire collection specific data on learning environments use and existing approaches. Based on the OECD instruments, the administering of this survey will open opportunities to broad application of OECD modeled School User Survey. Overall, this approach could be a string contribution to the Education Strategy 2030 priorities and goals and could be a strong instrument for policy development.

ECEC: Recommendations for learning environment improvements

Based on the direct LE-focused analysis of MOES administrative data on preschool facilities, the following areas of improvement have been identified:

- In preschools more than 90% of direct learning environments' renovations include partial and major repairs of buildings' interior and upgrades of playrooms and sleeping facilities, however the information about the connection between spatial arrangements and learning concept is limited. Major renovations in ECEC institutions should be planned and implemented in line with pedagogical concepts and contemporary trends in designing LE, which are flexible, transformative, diverse, inclusive and supporting play. It is important to incorporate the LE concept in the National ECD curricula, which should determine and provide connection with other LE standards and regulations for preschools (please refer to the page 35 of this report).

- More focus is needed on the improvement of actively used space for children in the ECEC institutions. Bulgaria should use international practices and elaborate its concepts for optimization of available spaces and develop more interactive spaces accommodating multiple functions and activities, including play, sports, interactions, time for rest and self-reflection. Similar approaches and investments addressing optimization of sleeping facilities, corridors and common space in education institutions are recommended (please refer to the pages 37 and 40 of this report).

- According to MOES data, despite of constant repairs, the playroom remains the most needed space for renovation (a half of the preschool demand the rehabilitation of existing playrooms, while 4% require the construction of new playrooms). Future investments in this area should be aligned with the pedagogical programs of preschools, national ECD standards, National Education strategy and contemporary approaches to LE design. The MOES could stimulate preschool leaders to conceptualize the playrooms through special competitions, grants, education programs for preschool leaders.

- Investments and introduction of minimum requirement for outdoor sports and playground facilities to facilitate child development, early learning, physical activities and healthy behavior of children in ECEC institutions are needed. Such focus could influence the ambition of the Education strategy to balance between traditional education purposes and 21st century skills targets for the system (please refer to the page 41 of this report).

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- Almost two-thirds of Bulgarian ECEC institutions lack interior sports facilities. Indoor space design in preschools might provide a good opportunity to avoid sedentary behavior, promote physical activity, interaction and learning. The MOES and Ministry of Health should prioritize such investments to promote physical activity and healthy lifestyles in preschool. This focus could be aligned with the concept of Green preschool/school introduced by National Education Strategy (please refer to the page 41 of this report).

- Although the MOES didn't collect the data on availability of STEM facilities in preschools, the ECEC institutions might demonstrate the desire to participate in STEM creative processes following the MOES policy priority on STEM development. Thus, if the ECEC institution are incorporating STEM elements in their curricula and learning content, it is advisable to develop the recommendations for the design of interior environments in preschool premises with regards to STEM disciplines and activities. This is especially important with regard to creation of preschool groups in general school premises (please refer to the page 46 of this report).

- As only third of ECEC institutions have dedicated LE for children with SEN and inclusive education and as almost half of preschool reported the need for construction new LE for the children with SEN, it is recommended to conduct a more detailed analysis of the existing stock of LE for inclusive education and children with special educational needs, as well as preschool leaders/teachers needs review in creation of such spaces (please refer to the page 45 of this report).

- The collection of preschool users' (teachers, children, directors, parents) subjective perception of and satisfaction with LE could complement structural assessment and data collection on the ECEC institutions. The WB team designed a questionnaire for this purpose, although these evaluations could be done through a focus-group interview too. The MOES can use similar self-assessment measures for DLE audit in order to assess the quality of existing preschool DLE and take investment decisions in education infrastructure development, which address learning and child development.

General education: Recommendations for learning environment improvements

- There is no statistical data and other information available on spatial arrangement requirements, standards or curricula norms for LE in preschool groups organized in general education settings, which represent a transitional DLE. It is important to develop special LE guidelines for such preschool groups, as well as jointly used areas for preschool-age and primary school-age children. It would ensure the creation of stimulating, learning-oriented and comfortable environment for the children, who transition from early childhood settings to school settings (please refer to the page 38 of this report).

- Almost a half of the Bulgarian schools did not complete the major renovations of buildings interior. At the same time, there are differences between the types of schools which implement the overhaul. The schools also report the needs in rehabilitation and new construction of basic infrastructure (canteen, health office, director office), as well as DLE (classrooms, digital classrooms, inclusive education spaces, STEM and libraries). Additional review of the barriers for future renovation is needed. The MOES could recommend

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applying multifunctional approach and active space optimization principle in renovation of these school areas. Introduction of DLE self-audit and presentation of DLE conceptual vision by educational institutions could be used as a selection procedure for funding.

- Universal investment coverage was reached for teacher's room renovation. MOES could continue with further analysis on the quality and elements of teacher's room renovation and how it is supporting everyday work, health and psychological comfort of the teachers at their workplace as a component of teacher policy and HR management packages. Limitation of the data set is not allowing for detailed analysis in this direction (please refer to the page 40 of this report).

- In Bulgarian primary schools the lack of computer software/applications for reading significantly impact the digital preparedness of students. In secondary schools' principals report a strong regional difference in availability of educational materials in the country, which again can affect learning outcomes and skills attainment of students. The MOES should consider conducting further analysis of LE resource's availability and usage through the self-assessment questionnaires (based on the one developed by WB team) and align the investments with the needs of the institutions.

- One third of sport facilities were renovated in general education schools, while half of primary schools and one third of basic schools are still missing the outdoor sport facilities (please refer to the page 43 of this report). The MOES should promote the introduction of indoor, outdoor sports and playground facilities across general schools to facilitate physical activities and healthy behavior among the children. The sport/playground areas are especially important for child development in the context of preschool groups in the general education settings and primary schools. In addition, the approach to support physical activity in schools can be developed in line with the Green School concept introduced in the National Education strategy, which includes component on healthy lifestyles.

- The current available data on STEM-classrooms and digital equipment availability suggest that limited number of schools in Bulgaria already started to create or adapt existing learning areas to teach STEM-related disciplines. However, there is a need for more detailed assessment to understand the needs of schools for STEM centers creation and how they use existing facilities. The international experience show that the STEM/digital areas could be arranged everywhere in the school premises and many countries design so-called STEM schools, where the learning content impact the overall planning of learning environments. The MOES might benefit from the fact that the National "STEM" program is at the early stage of the implementation and incorporate best international practices of STEM learning spaces design in order to facilitate optimal usage of LE and increase active space per child (please refer to the pages 46 and 47 of this report).

- The biggest focus in developing learning areas for the children with SEN and inclusive education spaces remains in secondary schools, as well as basic schools. Additionally, general schools report the need for the rehabilitation of the inclusive spaces or construction of new one. Current MOES data are limited for more detailed analysis of existing LE for inclusive education and children with special educational needs in general education settings. MOES could prioritize additional information collection on regional scope, needs and

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limitations of current LE for teachers and SEN children, as well as relevance to policy goals on inclusive education.

VET: Recommendations for learning environment improvements

- According to the MOES data, VET institutions represent the only group of schools, which constantly invest into modern direct LE. At the same time, VET institutions report the need of rehabilitation and construction of new DLE (activity rooms, digital classrooms, STEM areas, libraries). The MOES should further promote the development of such DLE in line with the principles of modern learning environments: openness, flexibility, multifunctionality.

- Less than one third of VET institutions renovated the practice base. Detailed analysis of the practice base elements usage by students and teachers might help to identify further needs of VET institution in LE and possible areas of cooperation with industry partners in developing of such LE. It is important to investigate possible overlapping of practice base with the other LE and to ensure optimal usage of these areas.

- The proportion of STEM-classrooms varies across different types of VET institutions, but overall representation of STEM still remains low. Following the approach of MOES in development of STEM-centers, which represent the collection of several classrooms and areas with a common focus on STEM disciplines, it would be important to monitor learning process organization, use of innovative teaching methods and incorporate best international practices of STEM learning spaces design in order to facilitate optimal usage of LE and increase active space per child.

- The overall recommendations for sport, inclusion/SEN and teaching staff facilities are similar to general education settings: i) development of indoor and outdoor sport facilities to support healthy behavior and physical activities of the students; ii) conducting the analysis of inclusive spaces usage with regard to geographical distribution and relevance to the policy goals on inclusion and supporting the children with SEN; iii) supporting the creation of healthy and psychological comfortable workspace for the teachers.

  The collection of VET institutions users' (teachers, students, directors, industry provider) subjective perception of and satisfaction with LE could complement the MOES data collection on the VET institutions. Such information will help to understand how the students and teachers are using modern DLE and what are the areas of quality improvement. The self-assessment can be done through the questionnaire developed by the WB team.

Planning and programming for learning environment: general recommendations

Based on the review of national and ESF investments, the review of policy priorities listed in the draft National Education Strategy 2030 and a draft Operational Programme 2021-2027, the following key aspects and areas for future program planning were identified:

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1) National Education Strategy 2030: general recommendations:

- **Teacher support and qualification programs are natural and successful instruments in incorporating and addressing LE through a concept approach focused on teaching and learning.** The teacher is a key agent in developing and using the contemporary LE. In the context of Strategy 2030 and future investment plans this approach could be considered as key to address LE through a mix of elements addressing learning – teacher practices, teaching materials and direct LE infrastructure elements (subject specific, classroom, activity room, library, STEM-classroom, digital classroom, etc.).

- **MOES needs to develop and coordinate its investment in LE through national funds by consolidating all the programs and funding.** It should replace fragmented activities and administrative burden from education institutions to access funds with contingency funds addressing LE that promote education concepts and minimum standards for LE. National programs for development of education are proposing diverse and low coordinated approaches that are not able to demonstrate consistent approach contributing to learning. The system of national programs could develop info-coordinated and needs-oriented approach based on specific data of LE profiles and needs of education institutions.

- **Establishment of a specific Fund for Good Ideas for education to allow quick access to funding for developmental needs related to education might play a role of activator for counterparts and processes in education.** Learning environment could be one of the elements of together with needs and innovations in education. The establishment of such "fund" could combine national funds, EU investments crowd funds and donors and function in the scope of a trust fund flexibly addressing education. In the context of learning environment such fund could promote contemporary learning environments with dissemination and promotion activities, such as architectural competitions, publications, scholarships, experiments in education, special event addressing key stakeholders.

2) Operational Programme 2021-2027: recommendations:

- **Following the recommendation of the new ESF+ regulation on creating equal access to all level of education, specifically for vulnerable groups and supporting learning mobility, it is important MOES to consider including learning environment as a part of the project design components together with new curricula, learning courses, which are introduced for ECEC, general education and VET sectors**. International studies show that pupils' satisfaction with school environment and better psychological climate with lower level of bullying might impact learning outcomes of the children, especially from lower socio-economic groups.[1] Therefore, soft measures on upgrade of learning environments could be included in the project design (participatory exercises to develop new learning environments layouts with the different groups of children, evaluation of the needs of users to create equal access to the learning environments and education process, upgrade of furniture and equipment in connection with the project objectives,

[1] Shmis, Tigran; Ustinova, Maria; Chugunov, Dmitry. 2020. Learning Environments and Learning Achievement in the Russian Federation : How School Infrastructure and Climate Affect Student Success. International Development in Focus;. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/32598

introduction of teacher practices, which envisage change of learning environments). Following the lack of investments in the conceptual development of learning environments (aligned with education concept) in Bulgaria, these activities will help to develop LE as a key component to support learning.

- **Learning oriented guideline, which serves as an addition to existing formal standards on infrastructure will be needed to facilitate management approaches and policy needs.** The Government of Bulgaria is planning to separate the management of capital investments (Regional Development Fund) from education investments (OP and National funds for education) and this approach might stimulate the formal application of existing infrastructure standards that are not addressing a leading learning concept or promoting specific learning oriented goals. MOES is advised to lead and influence that process by developing a specific guidance on learning-oriented requirements for investments and develop a package of information and training materials for administrative project managers and the system overall to inform and guide the process.

- **The future national and EU investments should clearly reflect the conceptual approach to learning environment for each education sub-sector - ECEC, general education and VET in the framework of the funding of each sub-sector.** Currently, the draft OP for education mentions different aspects of preschool/school learning environments: for example, it mentions social environment (inclusion, prevention of bullying), specialized supportive educational environment (inclusion), digital environment, cloud environment (ICT), different learning environments for skills competence (VET), innovative learning environments (preschool/general education), real work environment (VET), multilingual environment (inclusion). However, OP did not identify general concept of DLE, as well as key elements of above-mentioned environments. The OP could specify the structural elements of these environments to be a subject of improvement (e.g. teacher's training on LE assessment and usage, learning aids, LE furniture upgrade). Additionally, the OP could introduce a special sub-section on learning environments improvement for each priority area.

- **The consequences of COVID-19 pandemic changed the way LE are used across the globe, therefore the priorities under the OP might reflect this focus when addressing ESF+ policy priorities, especially in terms of digital skills development.** The restrictions introduced in the school and temporary lockdowns, as well as introduction of distance learning might introduce significant changes to the use of existing learning environments. The MOES might consider to address these issues through OP actions (teachers' training of distance mode pedagogical practices, development of virtual learning environments), also because the COVID-19 scope was addressed in the EC review.

- **Development of a possible connection between the Green Deal policy and the concept of Green schools, introduced in the Education 2030 Strategy.** The EU will finance significant rehabilitation of schools in the framework of Green Deal to ensure that physical learning environments (school buildings) are more energy efficient. In terms of the ESF+, the future projects might target soft measures of learning environments development: teacher trainings on development of green educational environments, development of curricula and assessment of existing learning environments by users. Additionally, the OECD teacher questionnaire on key elements of LE (light, temperature, comfort) might inform this thematic area and collect necessary data for OP.

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Next steps

Following on the agreement from the coordination and technical meetings, the following steps are proposed for the EA OPSESG and MOES teams:

1. Validation discussion on LE findings and proposals with EA OPSESG an MOES representatives. The WB team will initiate a validation session following written comments and feedback on the present analysis. Bulgarian translation of the current document will be submitted according to the Agreement.

2. Interactive dashboards on LE based on MOES data set. The WB will provide additional deliverable to MOES representing consolidation of the MOES data set on infrastructure renovations. The instrument will be presented and discussed during the forthcoming validation discussion.

3. Distribution, data collection and analysis of the electronic questionnaire proposed to collect detailed information on the use and specific application of direct LE. As of delivery date of this report the electronic questionnaire implementation has not started due to MOES procedures needed on electronic platform access. The WB team will continue the process and stands ready to apply this instrument following a special request for extension of the deadline for this specific activity that will enrich MOES knowledge and planning information for LE. During coordination meetings an agreement has been reached that the WB team will utilize MOES networks for research work. Under the initial proposal WB listed a collection of data from three key groups of respondents – principals, teachers and students. The approach chosen was to develop the data collection on institution level through principals. The existing delays with the instrument addressing principals might be indicative that the team should not extend efforts in developing instruments for the remining groups that will require much complex methodology and application approach. The proposed approach is for the MOES to provide its platform to publish the questionnaire, as well as to collect and store the final data. WB team will manage, clean and analyze the data to develop final additional analysis to add on the planning. Following consultations, additional time is needed for:

- designing and processing the electronic version of the questionnaire on the electronic platform of MOES;
- data collection, data cleaning and data analysis;
- brainstorming meeting to validate findings.

4. Analysis and review of MOES implementation approaches and outcomes based on the consolidation of data on coverage and scope of NPDE and OPSESG provided by MOES. To observe the effects of the national and EU investments on LE a consolidation of data for education system beneficiaries for a selected list of national programs for development of education and OP has been established and validated. As per communication from September 15, 2020 MOES has not provided data allowing to conduct such analysis. Information on missing projects has been communicated. The team stands ready to conduct this analysis following necessary data access on program and beneficiary level.

5. Review of existing construction and infrastructure related standards to inform policy development and programming. Under the approach proposed on LE analytical work and support, the WB implements a two-stage approach for LE consultative work. During the second stage, following the analytical work and mapping, a review of the existing standards addressing direct LE has been proposed. The team will initiate coordination meeting to address and agree on a more specific framework for this activity following the completion of the validation workshop and planning in respect to the electronic questionnaire.

Study scope and approach

This study addresses a specific request from MOES of Bulgaria in relation to the direct LE of preschool and school institutions. In the framework of this analysis and the associated empirical work, direct LE refers to the physical space of an educational facility in which the learning and interaction between teachers and children and between children themselves occur. The study covers preschool, school and vocational education and training (VET). The following key elements of LE have been assessed: classrooms/playrooms, workshops, libraries, sport facilities and other learning spaces, including indoor public spaces (e.g. corridors) and technological equipment. Opportunities and limitations are discussed together with recommendations for future investments and policy consideration regarding LE described in the framework of National Strategic Framework in Education 2030.

The report starts with an overview of international trends and approaches to the development of learning environments. It provides the information on best practices and national educational infrastructure investment programs of the European Union and OECD countries.

Section two of this report provides analysis based on two information sources:

i. International Large-scale Education Assessments (namely PISA 2018-2000 and PIRLS 2016).
ii. Existing stock of learning environments data in the early childhood education and care (ECEC), general education and VET sectors that MOES collected from all education institutions in July/August 2020 with focus on dimensions related to major repairs of preschool/schools and associated investments provided through national, EU and other funding. The available information has been used to inform primarily direct LE knowledge (e.g. interior building rehabilitation, learning and administrative spaces rehabilitation, indoor and outdoor sport facilities, furniture and equipment upgrade, introduction of STEM-classrooms and inclusive education facilities) and contribute to the capital investments analysis of MOES.

The WB developed mapping instrument addressing direct LE, and information informing specific trends and needs in school and preschool education. The questionnaire was developed to collect data about the availability of selected structural elements of learning environments and its use by the preschool/school principals, as well as teachers. The design of the questionnaire was based on the OECD School User Survey, as well as the questions to reflect key priorities of the Strategic Framework for the Development of Education and Training in the Republic of Bulgaria (2021-2030) and a draft Operational Program under the ESF+ framework. The methodological approach and the preparation stage findings are included in the report.

The third section presents a review of selected Operational Programs of comparator countries, namely Czech Republic, Slovenia and Estonia. The selected OPs cover various education policy priorities and address the second programming period of 2014-2020. Second part of this section is dedicated to the European Social Fund (ESF) investments review with focus on LE for the period 2014-2020. Being a key financial instrument for EU strategic policy development, new ESF+ investment priorities and multiannual financial framework for 2021-2027 are the key factors that will influence LE investment planning and future program design and ideas. Examples from EU countries are provided to inform development of potential future investments and demonstrate specific support for learning environment investments through ESF.

Section four provides a review of Bulgaria policy developments and investment mix to direct LE. The review reflects primarily the National Programs for Development of Education (NPDE) and projects funded under OP Science and

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Innovation for Smart Growth (OPSESG) for the period 2014-2020. This is followed by key recommendations in section five.

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I. Background and Context

Pursuant to Goal 4 of the UN Sustainable Development Goals (SDGs) on quality education, establishing a safe, inclusive and effective learning environment (LE) for all is essential[2]. Countries need to guarantee the efficient use of educational resources in order to deliver the maximum benefits to all children[3]. Hence, the approaches supported by scientific evidence on how to plan and arrange educational environments with better impact on children become important.

The education content and teaching methods are changing towards the development of so-called "skills of the 21st century". The modalities of everyday work and professional employment are changing. New technologies are changing the way we communicate and interact with each other and people are becoming more mobile and are forced to make decisions facing uncertainty and encountering a large amount of information. As researcher Julia Atkin notes, "young people now need to be able to quickly adapt, learn to solve complex, unfamiliar problems, and interact in communities that are less hierarchical than those to which their parents or teachers were used"[4]. Thus, the education system should contribute to the development of not only content knowledge and cognitive skills but also socioemotional skills, which, in fact, reflect a person's character. These include openness, curiosity, creativity, initiative, adaptability, stress resilience, the ability to self-control, decision-making, teamwork and collaboration. These skills are best developed or strengthened when the child is in school[5].

The development of new educational approaches and the need to develop socio-emotional skills, **require reorganization of the LE.** A LE is the space and context where the learning occurs, including the physical and virtual settings and teaching/learning materials following pedagogical approaches and led by qualified teaching professionals. There is a need for a diverse and open environment with places for large and small groups to interact, flexible places for learning, which provide different functionality with minimal effort, spaces for communication and relaxation, and freedom of movement for children. The design of the LE should be closely related to the curriculum that is implemented in it.

International research studies showed a significant relationship between children's development and different parameters of the LE. For example, children's level of self-control increases when the educational environment provides an opportunity for initiative and can also be changed by children on their own[6]. Some parameters of physical LE may affect academic achievements of children. For example, the "Smart Classroom" study conducted in British schools showed that 16% of changes in educational outcomes depend on the quality of the physical characteristics

[2] SDG 4 targets. URL: https://sdgs.un.org/goals/goal4
[3] World Development Report 2018 (WDR 2018)—LEARNING to Realize Education's Promise. URL: https://www.worldbank.org/en/publication/wdr2018
[4] Atkin J. (2016). Redesigning learning environments for learning in 21stcentury. World Bank/OECD, Almaty.http://pubdocs.worldbank.org/en/153741458819725127/1-Redesigning-learning-environments-for-learning-in-21st-century-by-J-Atkin-eng.pdf
[5] Guerra, Nancy; Modecki, Kathryn; Cunningham, Wendy. 2014. Developing social-emotional skills for the labor market : the PRACTICE model. Policy Research working paper ; no. WPS 7123. Washington, DC: World Bank Group.http://documents.worldbank.org/curated/en/970131468326213915/Developing-social-emotional-skills-for-the-labor-market-the-PRACTICE-model
[6] Bagby MS, Dickie V and Baranek BT (2012) How sensory experiences of children with and without autism affect family occupations. The American Journal of Occupational Therapy 66: 78–86.

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of the classroom (light, temperature, air quality)[7]. International reviews confirm that: age-appropriate learning spaces, easy navigation between learning spaces and mid-level ambient stimulation using color and visual complexity taking into consideration the local climate and cultural conditions have significant impact on academic achievements and development of children [8]. It is important that each space meets the needs of its inhabitants, namely the children and the teachers, as well as school administration teams. Psychological climate in the school also depends on the quality of LE. Better interior planning might help avoid bullying and help to improve educational outcomes of children in the long term, especially among children from disadvantaged socio-economic groups[9].

The interior arrangement and design of education facility should guarantee the active space use, so the children have access to maximum spaces of LE and can use it anytime for various learning or play activities. Contemporary approaches tend to switch from the conventional designs that require a lot of corridors/connection nods and functional rooms for each activity to open and multifunctional spaces. This type of interior LE serves as a core central space for communication, play and socializing between age groups, sport activities, creative and art performances. The optimization of used space supports the creation of smaller buildings in a total area size but with higher quality LE. For example, the Danish kindergartens are usually 40% smaller in overall space than Russian (~10 square meters (sq. m.) per child versus ~20 sq. m. per child). However, the so called "active space" is up to 4 times more in Danish modern preschools than in Russian conventional standard model kindergarten: 7-8 sq. m. per child versus 2.5 sq. m. per child which is the norm in most post-soviet countries.[10] The number of active spaces in the educational environment affects the development of social skills, creativity, reducing conflicts and increasing self-confidence.

The educational environment is not limited to the walls of the school and its area. Everything that surrounds contemporary school today is becoming important in terms of learning. The urban or rural environment of neighborhood, shops, cultural facilities, facilities for extracurricular education, parks, sports yards, playgrounds become part of everyday learning for children. Therefore, in many countries local community starts playing an important role in the planning of new educational institutions and other facilities that surround them, identifying how the kindergarten or school should integrate into the life of community[11].

1.1. General trends in learning environment policies

The learning environment becomes a focus of national strategic education policies. European countries launched big investment programs to upgrade existing stock of education facilities or build new. Countries are focusing more on investments in facilities that have direct relationship with the pedagogy, user's and community needs. Estonia

[7] Barrett, P., Y. Zhang, F. Davies, and L. Barrett (2015a). Clever Classrooms: Summary Report of the HEAD Project, University of Salford: Salford.

[8]Barrett, Peter; Treves, Alberto; Shmis, Tigran; Ambasz, Diego; Ustinova, Maria. 2019. The Impact of School Infrastructure on Learning : A Synthesis of the Evidence. International Development in Focus;. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/30920

[9] Shmis, Tigran; Ustinova, Maria; Chugunov, Dmitry. 2020. Learning Environments and Learning Achievement in the Russian Federation : How School Infrastructure and Climate Affect Student Success. International Development in Focus;. Washington, DC: World Bank

[10] Shmis T., Kotnik J., Ustinova M. (2014) Creating New Learning Environments: Challenges for Early Childhood Development Architecture and Pedagogy in Russia. Procedia - Social and Behavioral Sciences. Volume 146, 25, Pages 40–46. URL:http://www.sciencedirect.com/science/article/pii/S1877042814047387?np=y

[11] Barrett, Peter; Treves, Alberto; Shmis, Tigran; Ambasz, Diego; Ustinova, Maria. 2019. The Impact of School Infrastructure on Learning : A Synthesis of the Evidence. International Development in Focus;. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/30920

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approved Estonian Lifelong Learning Strategy 2020 focusing on socio-emotional skills development, earning process, education system participants, school climate and related resources. LE is recognized in this strategy as an integral part of the learning process and a safe and positive climate in the educational institution. It mentions, "*in order to create and maintain learners' interest, it is important to introduce **variety in learning environments** and the learning process by learning outside the school and using different technologies. In addition to learning, attention should be given to the social and emotional needs of the learners, i.e. to be accepted and to feel safe. Breaks that offer opportunities for physical movement lead to better behavior in class and help prevent school exhaustion.*" [12]

In Germany, according to 2019 data, municipal investments in the development of educational institutions turned out to be equivalent to the costs of maintaining the street and road network.[13] In 2017-2020, the German Federal Ministry for the Environment, Nature Conservation and Construction launched the **investment program "Social Integration of the Neighborhoods"** and allocated 200 million euros annually for this purpose.[14] The investments were directed to the construction or rehabilitation of schools, kindergartens and regional centers, as well as various social facilities.

In Italy, a national program on school construction was implemented by the Government and the Ministry of Education in 2014-2018. The aim of this program was not only to upgrade the existing education facilities infrastructure, but also to create **learning environments in connection with pedagogical approach.** A special task force was created under the government and the expert group, which included architects and pedagogues, and adopted special functional requirements for learning environments. More than 9.5 billion euros have been allocated in order to fund more than 11,000 building sites, 6,000 of which completed in 2018[15].

In Scotland, a new investment program for the construction of schools "Scotland Schools for Future" was launched in 2009 and delivered 117 new schools by 2020. During the program, local authorities, supported by the Scottish Futures Trust, interviewed students and teachers from 28 new educational institutions (built under the previous program) to study their satisfaction with new buildings, identify the most successful projects and formulated recommendations for new school buildings to make it **better suited to the needs of students and teachers**[16].

International studies show that LE is important for teachers in their instructions and teaching approaches and affects students' outcomes. The results of a survey disseminated to over 6000 school principals in Australia and New Zealand show, that if the teacher uses frontal approach (teacher facilitated presentation, direct instruction or large group discussion) in a traditional classroom, students show lower results in deep learning. However, if the teacher adjusts the pedagogical approaches to ensure better interactions even in a traditional classroom the students show higher results in deep learning[17]. Therefore, the study concluded that a school might lack certain elements of the

[12] https://www.hm.ee/en/learning-approach
[13] KfW Panel 2019. https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-KfW-Kommunalpanel/KfW-Kommunalpanel-2019.pdf
[14] https://www.investitionspakt-integration.de/
[15] Nucci, L., Galimberti, L. Towards a new school's role in the Italian contemporary city. *City Territ Archit* **7,** 2 (2020). https://doi.org/10.1186/s40410-019-0110-3
[16] https://www.scottishfuturestrust.org.uk/page/current-schools-for-the-future
[17]Imms, W., Mahat, M., Byers, T. & Murphy, D. (2017). Type and Use of Innovative Learning Environments in Australasian Schools ILETC Survey No. 1. Melbourne: University of Melbourne, LEaRN, Retrieved from: http://www.iletc.com.au/wp-content/uploads/2017/07/TechnicalReport_Web.pdf

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physical infrastructure, but the professional skills of the teacher may compensate this disadvantage. These findings call for more detailed analysis of the quality of the existing stock of educational infrastructure.

Educational facilities have become not only a national priority in countries, but also a topic of international cooperation. Since 1970 the Organization of Economic Cooperation and Development (OECD) is leading an international policy dialog on education facilities development, conducts research and collects national best-practices on education building investments, effectives of construction, impact of technology on learning and teaching, maintenance of existing stock of educational buildings.[18] In 2009 the organization established a Center for Effective Learning Environments, which maintains a database for exemplary educational facilities from all over the world, organizes regularly meetings of OECD Group of National Experts on Effective Learning Environments (GNEELE), which represents mainly OECD member countries, to discuss national policies on educational infrastructure development, as well as exchange of best practice[19]. In 2018, OECD promoted the application of School User Survey – a self-assessment tool for the evaluation of learning environments in schools from the perspectives of pupils, teachers and principals.[20]

New approaches to the planning of learning environments are starting to show impact on the existing sanitary, construction and fire-protection standards that regulate new construction and maintenance of educational facilities in many countries. On one hand, these standards are important because these norms provide important safeguards to ensure that educational buildings are safe for operation. At the same time, it is necessary to harmonize and update these standards on regular basis following the changes in education curricula and new scientific, as well as technological findings in these fields. Obsolete standards may hinder the development of contemporary learning environments and add additional cost to new construction activity. Following new trends in developing open, flexible and transformative learning environments, many countries adopted new acoustic codes, specifically for open plan school buildings. These standards currently exist in Denmark, Norway, Iceland, Sweden and UK[21].

Additionally, it is important to provide design guidelines on construction and rehabilitation of educational buildings in connection with contemporary approaches. For example, the World Bank has developed a set of these guidelines in the framework of its investment projects on educational facilities construction in Belarus, Serbia and Russian Federation. These guidelines describe the steps of construction and rehabilitation process of education facilities, provide recommendations on building analysis, its optimization, the use of colors, textures and surfaces, the use of furniture and give examples of international practices. Another document is a Roadmap for Safer and Resilient Schools (RSRS), which is a step-by-step guide how to make school infrastructure safer and more resilient to natural hazards, like hurricanes, earthquakes, etc.

[18] Designing for Education. Compendium of Exemplary Educational Facilities 2011. DOI:https://dx.doi.org/10.1787/9789264112308-en
[19] http://www.oecd.org/education/effective-learning-environments/
[20] http://www.oecd.org/education/effective-learning-environments/OECD-School-User-Survey.pdf
[21] Møller Petersen, C., & Rasmussen, B. (2012). Acoustic design of open plan schools and comparison of requirements. In P. Juhl (Ed.), Proceedings of BNAM2012 Nordic Acoustic Association. Joint Baltic-Nordic Acoustics Meeting (BNAM), Proceedings, Vol. 2012
http://vbn.aau.dk/files/69932466/BNAM2012_Paper73CMP_BiR_AcousticDesignOpenPlanSchools.pdf

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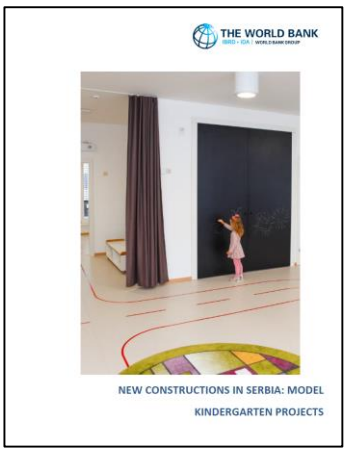
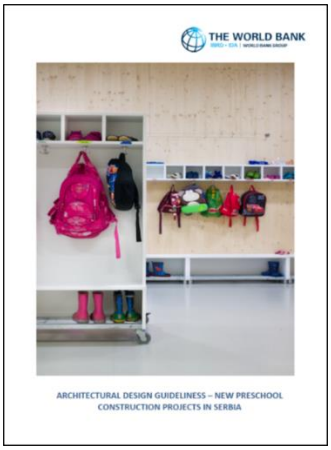
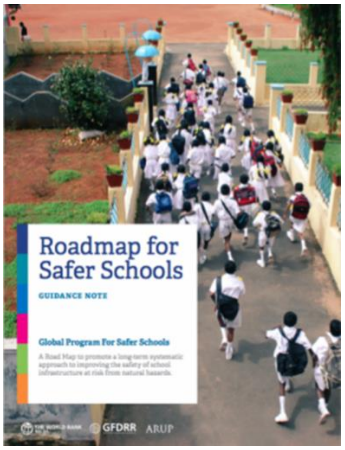
Selected guidance notes developed by the World Bank (Serbia; Recommendations on school safety)







It is important to supplement the development of contemporary learning environments with dissemination and promotion activities to generate awareness and understanding of the importance of such innovations. For example, in 2014 the World Bank completed an international architectural competition on the best design of a kindergarten for the regions of Far North and Far East of the Russian Federation. The competition was conducted in the framework of the preparation of an investment project in the Republic Sakha-Yakutia on kindergarten facilities construction.

Examples of the winning kindergarten design of architectural competition in Yakutia

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II. Direct Learning Environments in Bulgaria

2.1. International evidence and socio-economic perspectives

International learning assessments provide good information for comparative observations on the main elements of LE – teaching staff, teaching materials and infrastructure. Below a selective overview of questions incorporating LE aspects are presented to inform the LE profile of the country in comparison to OECD and comparators. More specifically, questionnaires for PISA, 2000 – 2018 are considered to explore and describe LE in the secondary education in the country and limited information available through PIRLS, 2001 – 2016 is information on primary education. The analysis includes description of LE as of 2018, trends over time and regional and socio-economic variations in LE available to students.

In secondary education, the comparison to the OECD countries and advanced countries in the region reveals that there are areas for LE improvement in Bulgaria, especially related to physical LE. Overall, according to secondary school principals (PISA 2018), Bulgaria provides a good LE to students in the three dimensions of LE: educational staff, educational materials and physical infrastructure and performs better than the OECD average (see Figure 1):

- Around 1 in 3 students in the country studied in a school that faced a lack of physical infrastructure and 1 in 5 students studied in a school with inadequate or poor-quality physical infrastructure;
- Around 1 in 5 students studied in schools that faced a lack of educational materials;
- Around 6% of students studied in a school where the directors report poor qualification of teachers and 8% of students were in schools experiencing lack of teachers;

Around 1 in 3 students in the country studied in a school that faced a lack of physical infrastructure; 1 in 5 students studied in a school with inadequate or poor-quality physical infrastructure. (PISA 2018)

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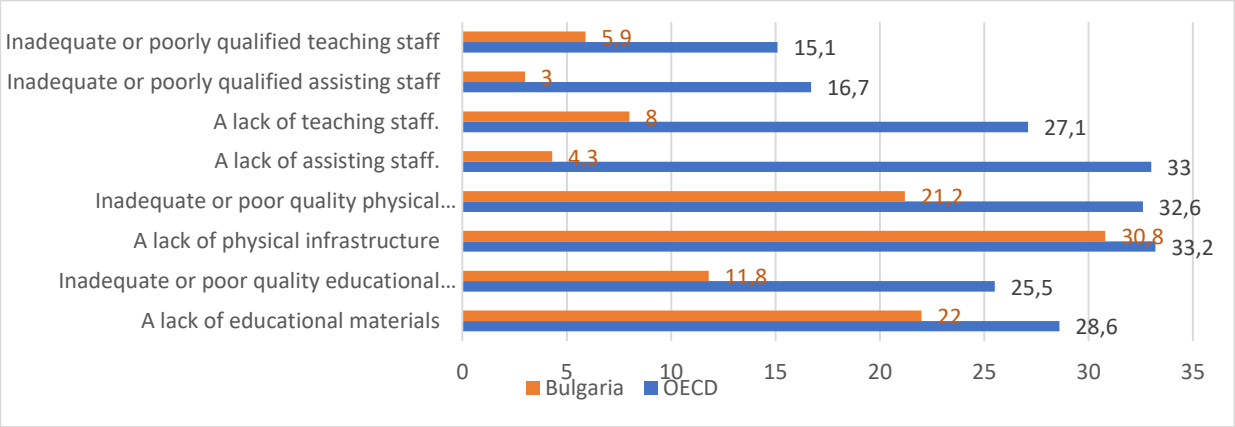
Figure 1: LE in Bulgaria

PISA 2018 Question: Is your school's capacity to provide instruction hindered by any of the following issues?
Percentage of students studying in schools where school directors agree 'to some extent' or 'a lot'



Source: Programme for International Student Assessment (PISA) – 2018

Similarly, though secondary schools in Bulgaria are generally digitally prepared, including to address a post-COVID resilient education system, in 2018 schools fall behind the OECD in terms of availability of digital equipment and platforms. As of 2018 Bulgaria performs better than the OECD average in a number of dimensions including availability of adequate numbers of skilled educational and technical staff and availability of incentives to integrate digital technology into the teaching and learning process in the schools. However, there are certain areas where the country lags:

- 60% of students study in schools where an effective online learning support platform is not available;
- Similarly, 58% students in the country study in schools where the number of digital devices for instruction is not considered sufficient by the school directors.
- Likewise, a little less than half of the students in the country study in schools where not enough digital devices are connected to the internet (see Figure 2).
- Computer to student ratios are in fact slightly lower in Bulgaria as compared to the OECD average (0.7 computers per student in Bulgaria as compared to 0.8 for the OECD countries, PISA 2018).

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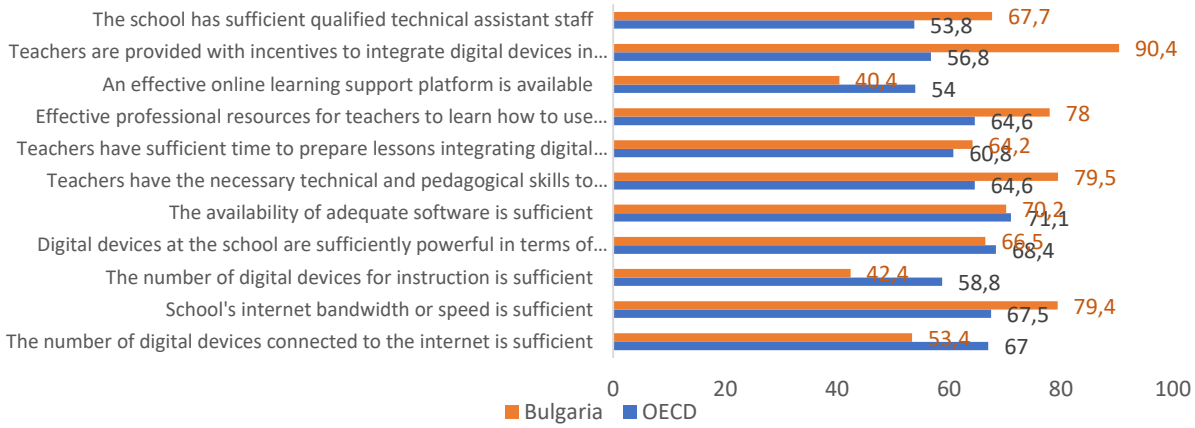
- *60% of students study in schools where an effective online learning support platform is not available.*
- *58% of students study in schools where the number of digital devices for instruction is not considered sufficient by the school directors.*
- *Computer to student ratios are slightly lower in Bulgaria, compared to the OECD average. (PISA 2018)*

***Figure 2*: LE in Bulgaria – digital preparedness**

PISA 2018 Question: To what extent do you agree with the following statements about your school's capacity to enhance learning and teaching using digital devices?
Percentage of students studying in schools where school directors agree to 'some extent' or 'a lot'



Source: PISA 2018

In primary schools the lack of digital preparedness is particularly apparent for primary schools in the country. According to PIRLS, 2016:

- 61 percent of students in grade 4 in the country study in schools with more than 2 students per computer as compared to an average of 38 percent for the OECD. Primary classes also lack library resources and computer software/applications for reading instruction;
- Around 60 percent of the students in grade 4 in the country study in schools with shortage of computer software or applications for reading instruction as compared to 29 percent average for the OECD countries participating in PIRLS, 2016 (see Figure 3: LE in Bulgaria – digital preparedness in primary schools

  PIRLS 2016 Question:

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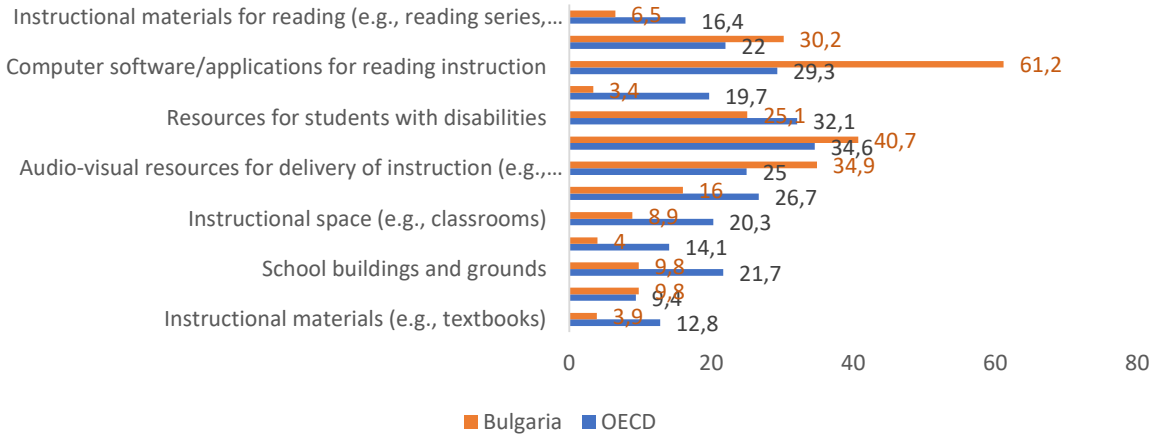
Figure 3: LE in Bulgaria – digital preparedness in primary schools

PIRLS 2016 Question: How much is your school's capacity to provide instruction affected by a shortage or inadequacy of the following?
Percentage of grade 4 students in schools where school director agreed 'to some extent' or 'a lot'



Source: PIRLS, 2016

Overtime the availability of education materials improved in secondary schools but still 22% of secondary students are attending school with reported poor education materials (PISA 2006-2018)

In secondary schools there have been considerable improvements over time, particularly in the availability of educational materials. PISA 2000 – 2018 datasets have been used to explore trends in LE in the country over time. The question format in PISA slightly changed over the years and though the question on LE in PISA 2018 is directly comparable to the question in PISA 2015[22], the question components were different in the earlier versions of PISA. Therefore, we compare responses in PISA 2015 and PISA 2018 and responses in PISA 2006 to 2012 to question components that were consistent through the three earlier rounds of PISA.

- In 2015, a third of 15-year old students (33%) studied in schools with a lack of educational materials and one in five (21%) studied in schools with inadequate or poor - quality educational materials. By 2018, availability of educational materials improved considerably with around 22% studying in schools with lack of educational materials and 12% studying in schools with inadequate or poor quality educational materials

[22] Question on digital preparedness in PISA 2018 is not available in PISA 2015. PISA 2018 focused on digital readiness of schools and therefore included detailed questions on availability of adequate digital infrastructure in schools.

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- LE improved substantially from 2006 to 2012, especially in educational materials including scientific equipment and digital devices (see Figure 5)
- In fact, the number of available computers per student in grade 9 in the country improved from 0.4 in 2009 to 0.7 in 2018. [The computer to student ratio for the OECD improved from 0.6 to 0.8 in the same time period.]

8% of schools are facing lack of teaching staff according to principals in comparison to 27% for OECD. Between 2006-2012 the reported need for teachers consistently reduced from 23% to 8% in Bulgaria (PISA 2006-2018)

Based on school principals reporting in PISA a decreasing percentage of schools teaching 15-year-olds have registered shortage of teaching staff in the country. As of 2018, 8 percent of 15-year-olds studied in schools facing lack of teaching staff according to school principals in comparison to 27 percent for OECD (see Figure 1). There's a slight increase of 6.8 percent in 2015. PISA questionnaire had a specific question allowing to observe specific needs of professionals between 2006 to 2012. In this period the percentage of students studying in schools facing lack of qualified language, mathematics and science teachers have consistently been reported very low (0-2%). However, a higher percentage of schools faced a shortage of qualified teachers for other subjects. In fact, in 2006, 23% of 15-year-olds studied in schools facing shortage of qualified teachers for other subjects. From 2006 to 2012, this percentage considerably reduced from 23% to 8%. Similarly, student to teacher ratios[23] have improved considerably in the country from 22.2 in 2000 to 12.1 in 2018 (student to teacher ratios for the OECD have improved from 25.3 to 13.3 in the same time period.)

[23] OECD defines student/teaching staff ratio (STRATIO) as the number of full-time equivalent teachers divided by the number of students in the school. To convert head counts into full-time equivalents, a full-time teacher – employed for at least 90 percent of the statutory time as a classroom teacher – received a weight of 1, and a part-time teacher – employed for less than 90 percent of the time as a classroom teacher – received a weight of 0.5.

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Figures 4 and 5: changes in LE

PISA Question: Is your school's capacity to provide instruction hindered by any of the following issues?
Percentage of 15-year old students studying in schools where school directors agree 'to some extent' or 'a lot'

Figure 4: Changes in Learning Environment from 2015 to 2018

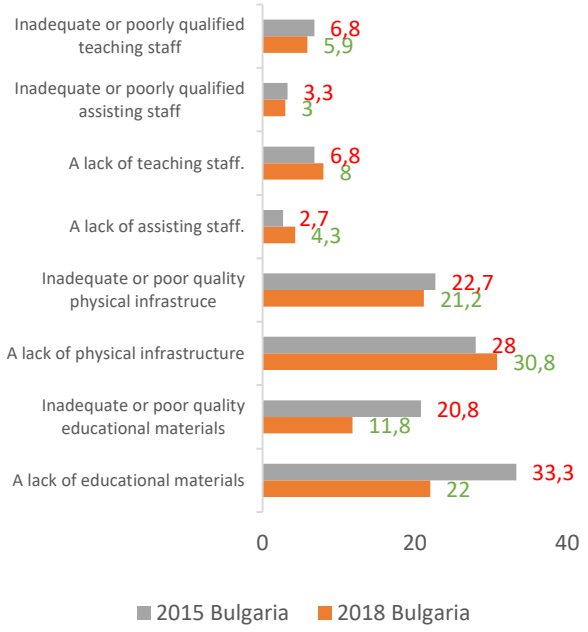
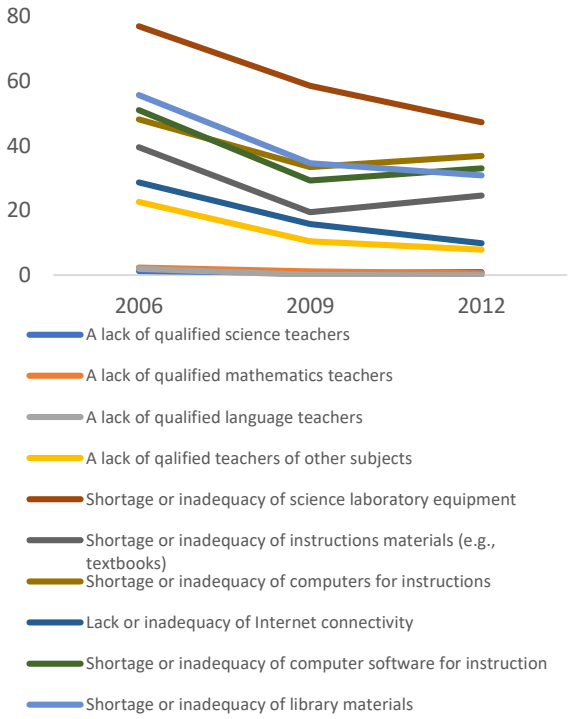


Figure 5: Changes in Learning Environment from 2006 to 2012



Source: PISA 2000 – 2018

Overtime the availability of education materials improved in primary schools. (PIRLS 2011-2016)

In primary education, similarly, significant improvements are observed over time in LE for students in primary grades. LE in the country have improved considerably over time across all dimensions (see Figure 6). However, from 2011 to 2016, the percentage of grade 4 students studying in schools facing lack of computer technology has increased (from 27 percent to 41 percent).

- In 2001, 61 percent of grade 4 students studied in schools facing lack of instructional materials like textbooks. By 2016, this percentage was down to 4 percent.
- Similarly, while in 2001, 44 percent of grade 4 students studied in schools facing lack of supplies like papers, pencils and materials, this was down to 10 percent in 2016.

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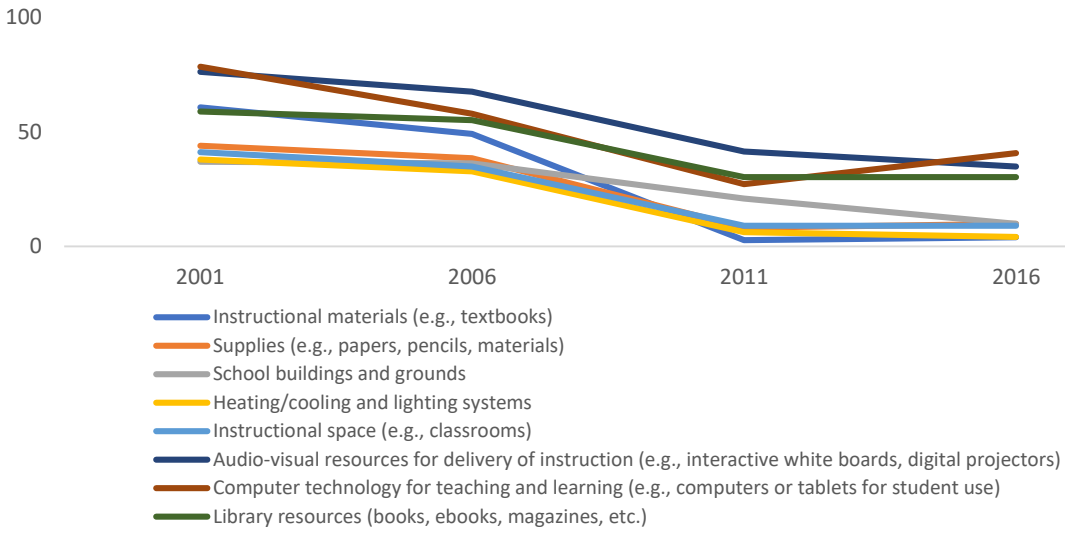
- Similar improvements are observed for infrastructure – school buildings and grounds, heating/cooling and lighting systems and instructional space (see Figure 6).

Figure 6: Trends in LE in primary grades – 2001 to 2016

PIRLS Question: How much is your school's capacity to provide instruction affected by a shortage or inadequacy of the following? Percentage of grade 4 students studying in schools where school directors responded 'to some extent' or 'a lot'



Source: PIRLS 2001 – 2016

Population in Bulgaria is projected to decrease across all regions in the country except for the capital city of Sofia. Birth rate in the country has declined consistently from 10 births per 1000 of population in 2010 to 8.8 in 2019. This decline in birth rate is observed across all regions in the country. Internal migration also affects the population projections. Majority of regions in Bulgaria are seeing an out-migration to the capital city of Sofia, Khardzali, Plovdiv, Shuman, Burgas and Varna (National Statistics Institute).

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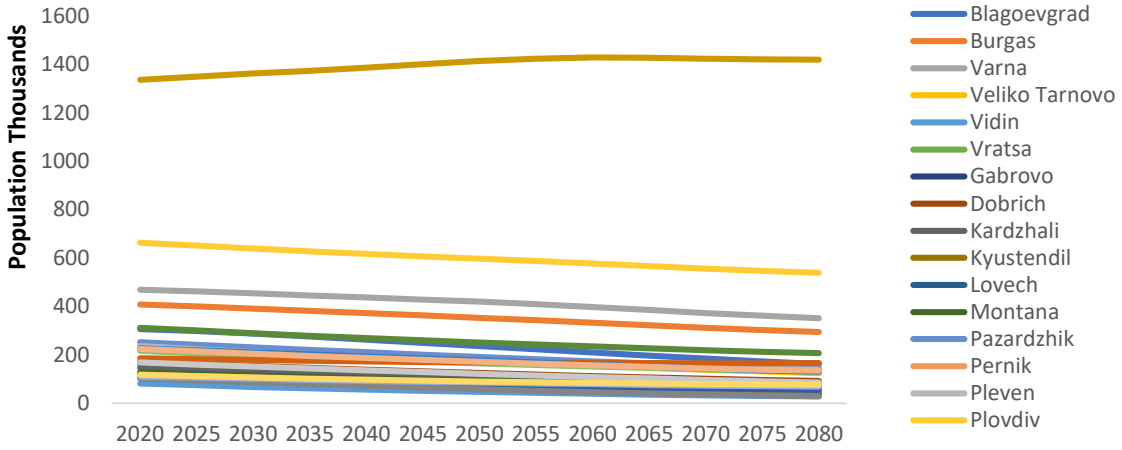
Figure 7: Population Projections for Bulgaria.[24]



Source: National Statistics Institute.

There are considerable differences in poverty levels across regions in the country. For this analysis, we categorize the regions in the country to the groups included as stratums in PISA. While the group of regions Sliven and Strata Zagora has an average (unweighted) poverty level of 28.50%, the group of Gabrovo, Lovech and Pleven (unweighted) has a poverty rate of 17.77%.

Table 1: At-risk of poverty rate by poverty threshold of the region (SILC 2019, National Institute of Statistics)

Stratums in PISA	*At-risk-of Poverty (Unweighted average)*
Sliven, Stara Zagora	28.5
Vidin, Vratsa, Montana	25.73
Yambol, Smolyan, Kardzhali, Haskovo	23.98
Dobrich, Razgrad, Silistra, Targovishte, Shumen	23.78
Ruse, Veliko Tarnovo	21.75
Varna	21.1
Pazardzhik, Plovdiv	20.9
Sofia city	20.8
Blagoevgrad, Kyustendil, Pernik, Sofia region	20.75
Burgas	20.1
Gabrovo, Lovech, Pleven	17.77

[24] Demographic projections (the population perspective projections) are calculations done under conditions set in advance for the future development of the fertility, mortality and migration. They give an idea for the population development during the projected period. Different scenarios for the population projections are used depending on the expected social-economic development of the country. The population projections presented here are defined as realistic and prepared according to the EU regulations on the member states demographic and social-economic development.

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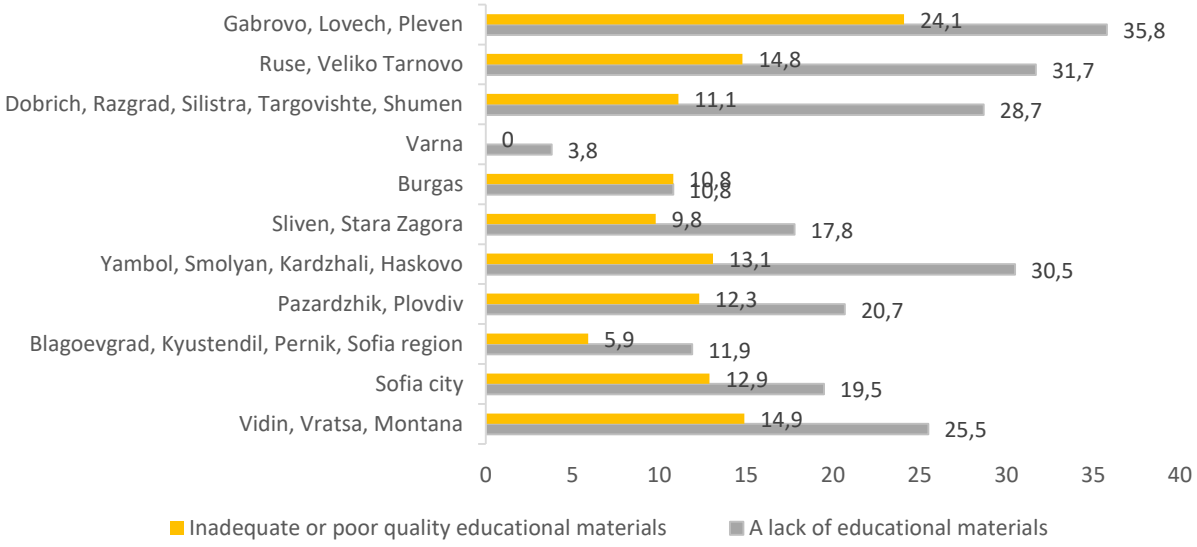
Strong regional differences in availability of educational materials are present in the country in 2018.
Physical learning environment in the country differs considerably across regions. *(PISA 2018)*

In secondary schools, the principals report a strong regional differences in availability of educational materials in the country. 60% of the 15-year old students studying in group of regions Gabrovo, Lovech and Pleven study in schools facing lack of or inadequate or poor-quality education materials. On the other hand, in Varna, only 4% study in schools facing lack of educational materials. These inter-regional differences highlight the need for prioritization of education expenditure according to school and regional needs.

Figure 8: LE in Bulgaria – Inadequate/poor quality or lack of educational materials in schools teaching 15 year-olds

PISA 2018 Question: Is your school's capacity to provide instruction hindered by any of the following issues: Percentage of students studying in schools where school director agreed to 'some extent' or 'a lot'



In secondary education, physical LE differs considerably across regions and do not follow the poverty trends in the country. The group of Gabravo/Lovech/Pleven, followed by Sofia, group of Vidin/Vrasta/Montana and Varna **regions** face the most severe lack of physical infrastructure and inadequate and poor - quality infrastructure. In these regions, around 40 percent of the students of age 15 study in schools with lack of physical infrastructure and 19 to 30 percent study in schools with inadequate or poor quality infrastructure. These regional differences in infrastructure, however, do not follow the poverty trends in the country. In fact, Gabrovo, Lovech and Pleven are regions with lower than national poverty levels (20.5%, 18.5%, 14.3% respectively as compared to national poverty rate of 22.6% in 2019)

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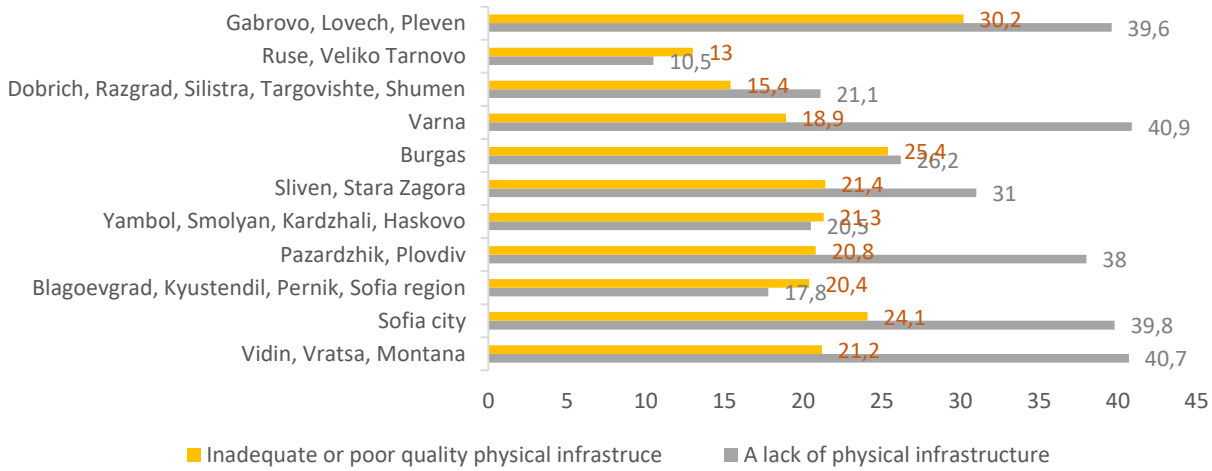
[SIC-2019]. Similarly, Sofia city and Varna regions have lower than national poverty levels (20.8% and 21.1% respectively). However, Vidin, Vrasta and Montana have higher than national poverty levels (26.4%, 27.7% and 23.1% respectively).

Figure 9: LE in Bulgaria – Inadequate infrastructure or lack of infrastructure in schools teaching 15 year olds

PISA 2018 Question: Is your school's capacity to provide instruction hindered by any of the following issues: Percentage of students studying in schools where school director agreed to 'some extent' or 'a lot'



Source: PISA 2018

In secondary education, despite targeted investments, digital Infrastructure varies across regions. (PISA 2018)

Similar high inter-regional variation is apparent in availability of digital infrastructure for secondary schools. For example, while 77 % of 15-year old students in Burgas study in schools with an effective online learning support platform, only 17% of students in the group of regions Ruse and Veliko Tarnovo do so. Like infrastructure and educational materials, there are not clear socio-economic trends apparent in the regional differences. While the combined group of regions Sliven and Stara Zagora have the second highest percentage of 15-year old students (56%) studying in schools with sufficient number of digital devices for instruction, the region has the highest poverty rate [Sliven: 30.1% & Strata Zagora: 26.9% - SILC 2019]. However, in Burgas, a region with a lower than national poverty rate and high satisfaction with online learning platforms, only 19 % 15-year old students studied in schools where school directors considered the number of digital devices for instruction to be sufficient. This further highlights the need for school-specific education development plans and corresponding school expenditure plans.

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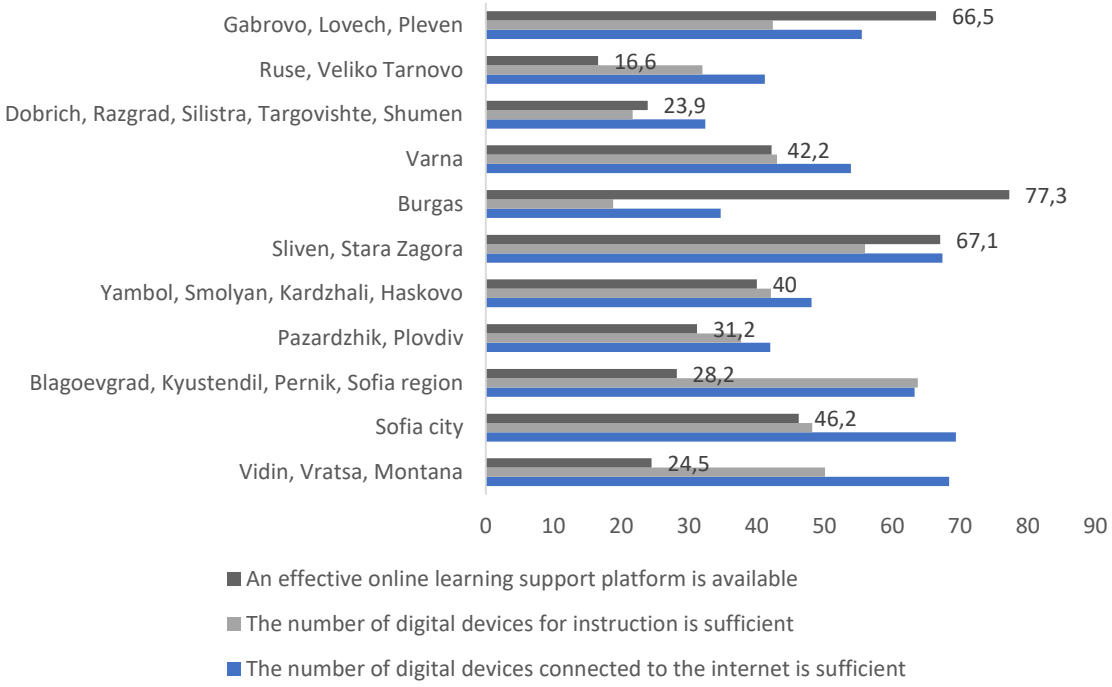
Figure 10: LE in Bulgaria – digital preparedness in secondary schools across regions

PISA 2018 Question: To what extent do you agree with the following statements about your school's capacity to enhance learning and teaching using digital devices?

Percentage of students studying in schools where school directors agree to 'some extent' or 'a lot'



Socio-economic factors do not define the poor physical learning environment. Rather, the education system policy and developments are influencing learning environment developments. (PISA 2018)

Bulgaria has large and persistent socio-economic achievement gap in learning outcomes for 15-year- old students. In PISA 2018, the richest 20 percent of 15-year old students performed 114 PISA points better than the poorest 20 percent of students (see Figure 11). This implies a socio-economic achievement gap of 114 PISA points - roughly equivalent to close to three years of schooling. This large socio-economic achievement gap in learning outcomes has primarily been persistent since 2000, with only a slight reduction since 2012. However, the slight reduction in the achievement gap in 2012 is a result of declining learning outcomes for the richest 20 percent of students instead of an improvement in learning outcomes for the most disadvantaged students.

While Bulgaria's secondary education is characterized with strong socio-economic differences between schools, poor physical LE is not necessarily explained by the socio-economic characteristics of the 15 years old students. Socio economic status in PISA is based on parental education, highest parental occupation and home possessions including books in the home. According to PISA 2018, the expressed challenges with LE by principals are similarly

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distributed across socio-economic quintiles of 15 years old students. This is signaling for systemic infrastructure challenges that characterize the education system.

Figure 11: PISA scores over time for top and bottom socio-economic quintiles

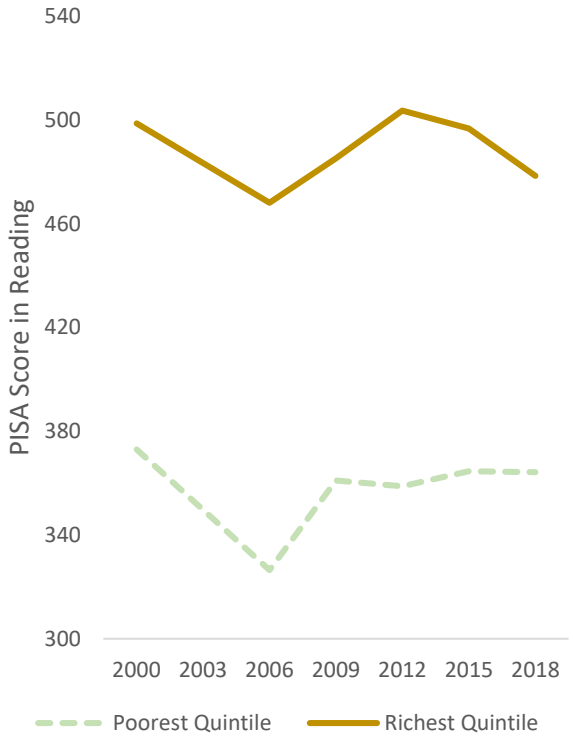
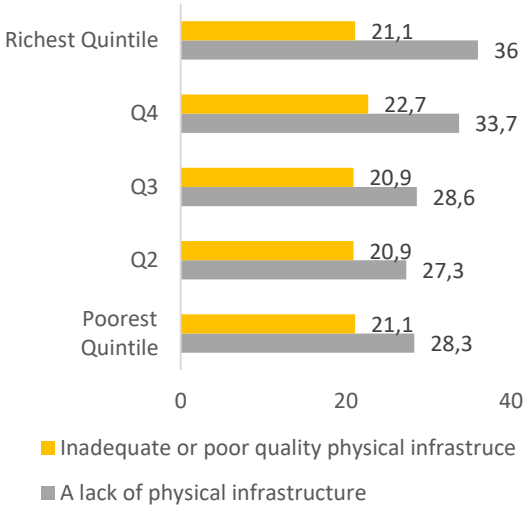


Figure 12: Physical LE in Bulgaria and socio-economic characteristics of 15 years old students

PISA 2018 Question: Is your school's capacity to provide instruction hindered by any of the following issues? Percentage of students studying in schools where school director agreed to 'some extent' or 'a lot'



Source: PISA 2018

Poor physical infrastructure is similarly distributed across learning achievements and quite close for socio-economic groups of students. (PISA 2018)

Without controlling for other factors, there is no significant relationship between trends in reported conditions of physical LE (infrastructure or lack of infrastructure) in the country and learning outcomes. In fact, a larger

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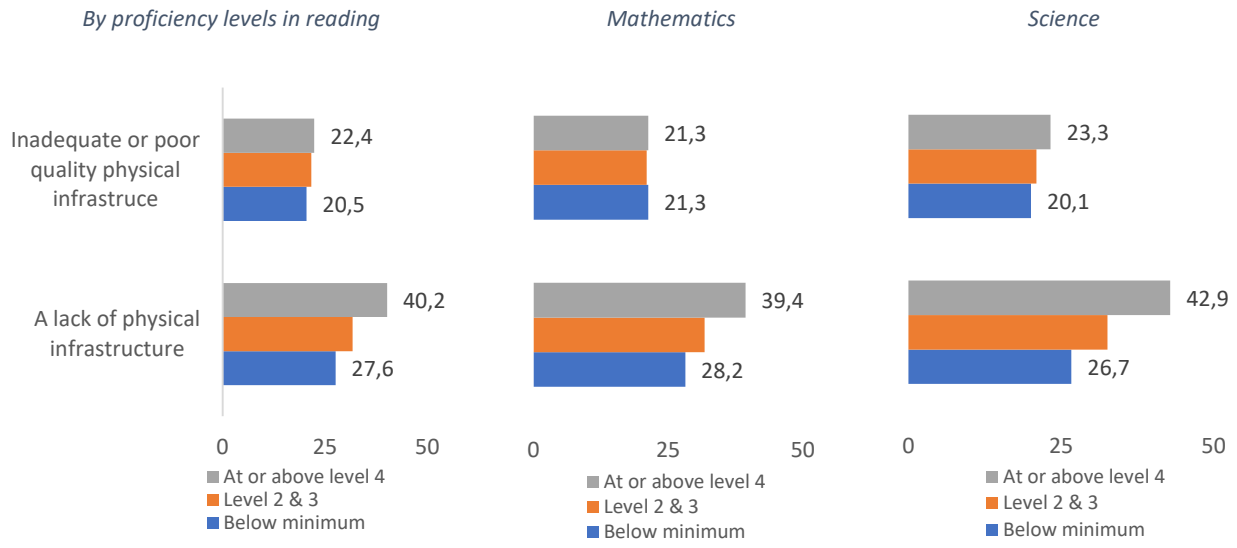
percentage of 15-year old students performing at proficiency level 4 or above study in schools facing a lack of physical infrastructure as compared to the percentage of students performing below minimum proficiency (Level 2 in PISA).

Figure 33: Learning outcomes and physical learning environments

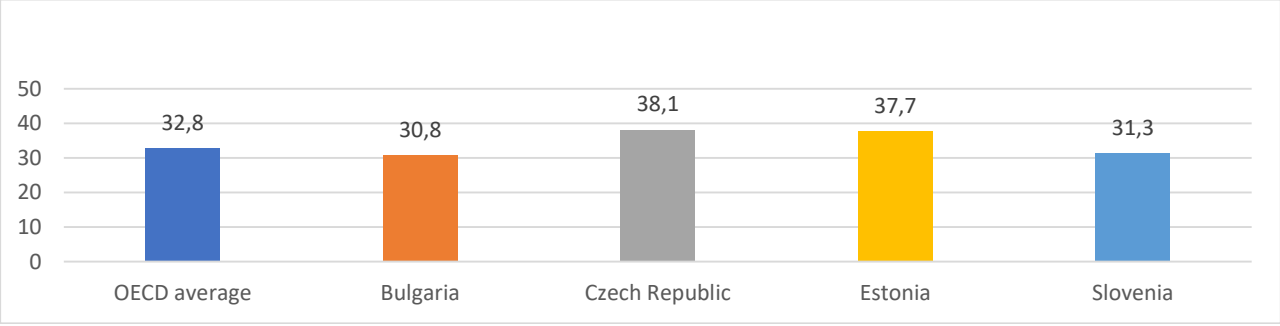
PISA 2018 Question: Is your school's capacity to provide instruction hindered by any of the following issues: Percentage of students studying in schools where school director agreed to 'some extent' or 'a lot'



The level of dissatisfaction with LE is close to comparator countries. 30% of students in Bulgaria are studying in the schools, where the principals report the lack of physical infrastructure necessary for learning - the school's capacity to provide instruction is hindered at least to some extent by a lack of physical infrastructure. It is slightly lower in comparison with OECD average and the situation in Slovenia, as well as differs with the data from Czech Republic and Estonia. It is important to understand what the standard for LE is that principals are referring to having in mind the learning outcomes of Bulgaria and the comparators.

Figure 14. Bulgaria and comparators - lack of physical infrastructure in secondary education

Percentage of students in schools whose principal reported that the school's capacity to provide instruction is hindered at least to some extent by a lack of physical infrastructure



Source: OECD PISA, 2018

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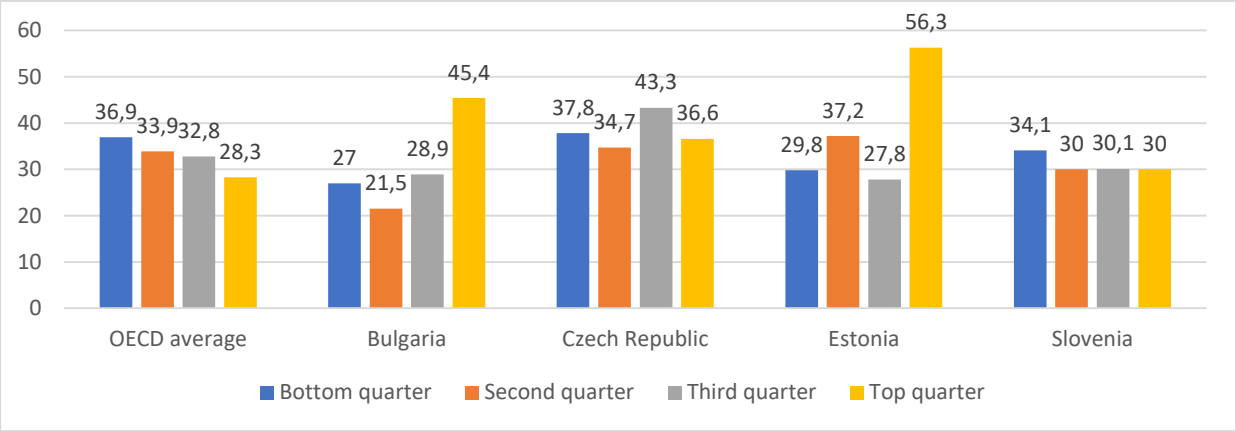
However, more Bulgarian students from better socio-economic background study in schools which are reported to lack physical infrastructure. The analysis of the schools based on their economic profile suggests that there is a significant difference between the students from various socio-economic backgrounds. In Bulgaria, 27% of students from lower socio-economic group are in schools with lacking physical infrastructure, while 45.4% of the students from well-off families attend such facilities. The latter is 17% higher than OECD average indicator for this socio-economic group. The same trend is observed in Estonia, where 56.3% of students of the highest income group attend the schools with lacking infrastructure. These differences are signaling for possible lack of shared standards or understanding for direct LE having in mind that in Bulgaria the higher socio-economic groups are in schools with more students and higher budgets, respectively better opportunities for LE investments.

Figure 15. Physical LE in Bulgaria and comparators and socio-economic characteristics of 15 years old students
Percentage of students in schools whose principal reported that the school's capacity to provide instruction is hindered at least to some extent by a lack of physical infrastructure, by school's economic profile



Source: OECD PISA, 2018

The analysis of physical LE quality, learning outcomes and socio-economic characteristics of the students suggest that poor quality educational infrastructure is equally distributed among different social groups and it does not divide the students in terms of access to education. However, it shows existing potential of further improvement in the area of LE and calls the MOES for better analysis of the barriers, which educational institutions experience, when seek for LE funding, as well as for better policy coordination of LE improvement across the country.

2.2. Direct Learning Environments in Bulgaria: MOES administrative review

MOES administrative review covers information about capital/external and interior renovations of the educational facilities, open sport yards and playgrounds, closed sports facilities, furniture and equipment of various interior learning and administrative spaces, as well as the availability of STEM-classrooms and rooms for the children with special needs (SEN) completed between 2010 and 2020. Data have been collected by MOES in August 2002. The scope of our analysis cover only learning environment elements, which relate to direct learning environments and is

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not providing a detailed review of data addressing buildings and major capital investments. The MOES administrative review covered ECEC, general education and VET, centers for special education support and special education institutions. The full network for preschools and school education has been covered - 1743 preschools, 126 primary schools, 1108 basic schools, 446 secondary schools, 95 specialized gymnasiums, 344 professional gymnasiums, 74 united schools, 25 sport and 23 art schools. The questionnaire aimed to collect information on (i)the major renovations and the infrastructure elements covered – addressing exterior and interior key investments and specific structure elements including roof, windows, sanitary rooms and others, (ii)data on specific investments that have been priority of Bulgarian education policies in recent years – inclusive education, focused priorities to STEM subjects, subject education, spaces for practice and on (iii) key elements of education infrastructure as dormitories and sport facilities. In addition, information on the combination of funding sources has been collected at institution level, without details on the separate investments. The WB team has consolidated the information provided, cleaned and adjusted entries for which non-standard entries have been present. Classification for specific text fields have been established and additional variable have been introduced to allow proper data observation and analysis. The data set has been translated into English and data set dictionary has been introduced to allow observations and analysis. Finally, test typologies of education institutions based on key learning environments findings have been developed and draft dashboards for outcomes review and information have been created.

Following a review of the data set, the following learning environment elements are considered a direct learning environment, addressing and influencing teaching and learning practices and addressed in the analysis below: Interiors of education facility; Playroom/Classroom; Sleeping space (in kindergartens); Open sports yard/facility or playground; Closed sports facility; Inclusive Education spaces; Spaces for children with SEN. The analysis that follows is restricted to direct learning environments as identified by this administratively collected information from MOES.

Majority of kindergartens had access to renovation. 99.7% of them investing in interiors but less than half had also invested in overhaul renovations. (MOES 2020)

In preschools more than 90% of direct learning environments' renovations include partial and major repairs of buildings' interior and upgrades of the playrooms, as well as sleeping spaces. The MOES administrative review covered 1734 kindergartens in 28 regions. According to the information presented in Figure 16, almost all ECEC institutions (99.7%) in the country implemented various partial or major rehabilitation of building's interiors, including its structural parts, sanitary units, and utilities' infrastructure during the last decade. The two key elements, which are constantly upgraded in terms of furniture and equipment are playrooms and sleeping areas. However, less than half of ECEC institutions combined the overhaul[25] with the upgrade of playrooms (44%) and sleeping rooms (43.1%). It is important to highlight, that despite of constant repairs, the playroom remains the most needed learning space for future rehabilitation (50% of preschool indicated the need for renovation of existing playrooms, while 4% demand the construction of new playrooms).

[25] Here we used data for "Цялостни ремонти"

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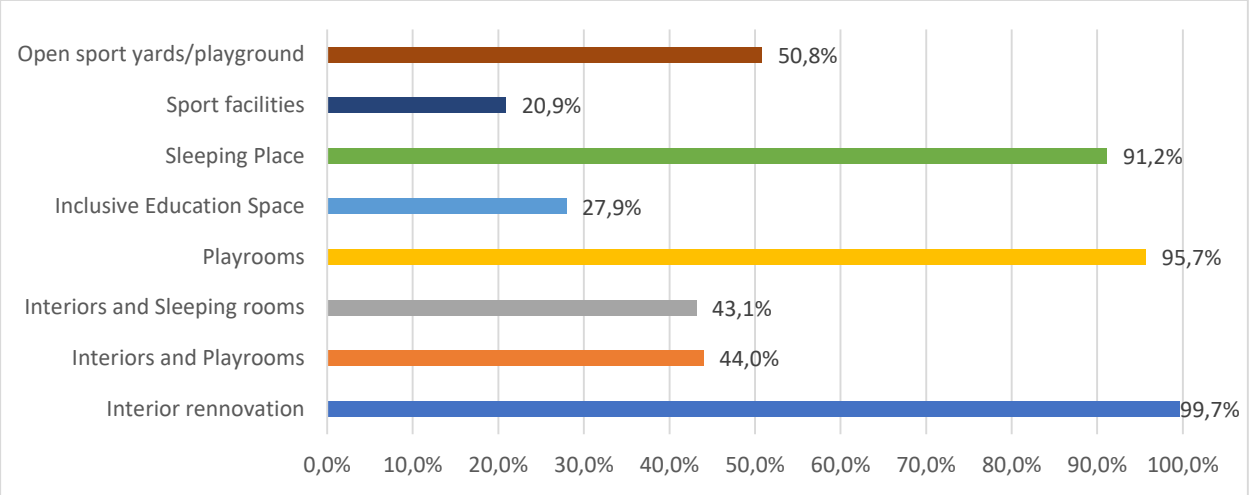
Figure 16. Renovations in ECEC institutions, 2010-2020



Source: MOES data, authors' calculations

91.2% of ECEC institutions completed the upgrade of sleeping rooms but there are no evidences for introducing innovative approaches in these areas as interactive spaces accommodating sleeping functions and other activities. (MOES 2020)

While 91.2% of ECEC institutions completed the upgrade of sleeping rooms, the data do not provide enough information on the detailed changes introduced to the spatial environment and how these places are used daily. The proper occupancy analysis and introduction of movable beds and flexible interior designs/furniture might allow to use these areas as the playrooms outside of sleeping hours and stimulate active space use. The children should have access to maximum spaces of all learning environments and use it anytime for various learning or play activities. With the introduction of recent policy changes providing for compulsory education for 4 years old the ECEC system and primary schools offering pre-primary groups there will be a special need in specific municipalities and providers to provide alternative solutions to spaces – especially for cities with high demand and under-capacity[26].

The better design and daily utilization of sleeping areas might carry the potential to improve the capacity of ECEC institutions. MOES should reconsider its data collection approach and introduce collection of specific data on the space approaches and their links to interactions with students and teaching practices.

[26] Please check Early Childhood Education and care. General Education and Inclusion: Situation Analysis and Policy Directions recommendations, World Bank 2020

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Stackable beds and foldable closet beds allowing for multiple use of sleeping space

Source: Wesco, dixib.com

Less than half of the Bulgarian schools completed major renovations of interior. (MOES 2020)

There are no details and information on the investments in preschool spaces in schools. The dataset collected by MOES did not cover the information on playrooms arrangements, furniture and equipment, as well as design of transition areas (cross-borders between preschool children and pupils), and shared facilities with general school. These structural elements of DLE are necessary to observe in order to guarantee age-appropriate spatial arrangements across preschools and school environments. The MOES data set is not allowing to observe communication between preschool and primary spaces and specific of the learning environment in that aspect. Further analysis in this direction will be provided by the electronic questionnaire to education institutions proposed (check below).

Less than half of the Bulgarian schools completed the major renovations of buildings interior. The most active in implementing major interior renovations (overhaul) were secondary schools (49,4%), followed by the primary (44.4%), basic (41%), as well as specialized gymnasiums (43,2%).

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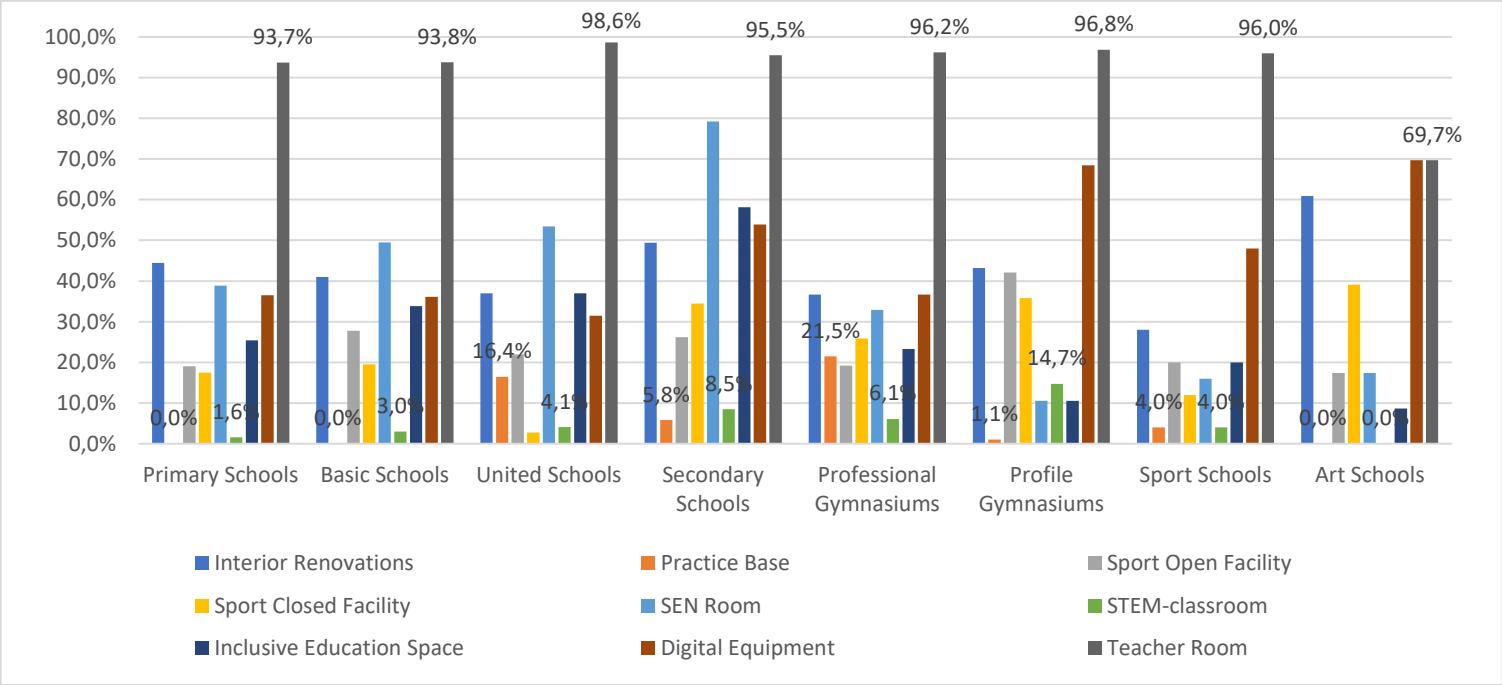
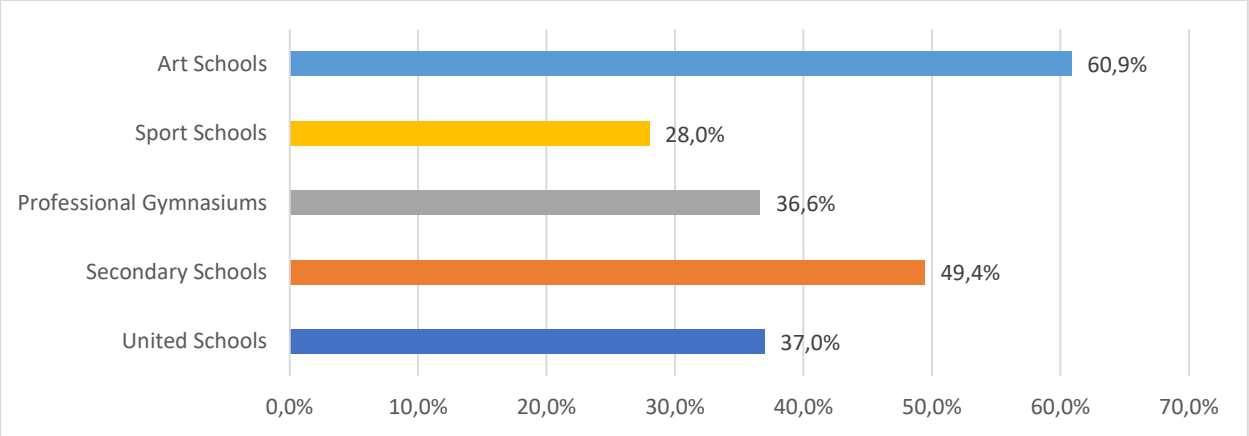
Figure 17. Learning Environments Rehabilitation in Schools, 2010-2020



Source: MOES data, authors' calculations

Among the institutions that provide VET education, the art schools implemented the biggest share of interior renovations. While 60.9% of art schools completed interior renovations, the united schools (37%), professional gymnasiums (36.6%) and sports schools (28%), which also represent the VET sector, implemented less rehabilitation of the interior (see Figure 18).

Figure 18. Interior renovation in institutions providing VET education



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About all of general education schools and VET institutions implemented the upgrade of equipment and furniture for teacher's room. The teacher room is the biggest focus of renovation for all types of institutions, including general education: 93.7% of primary, 93.8% of basic, 95.5% of secondary schools, and 96.8% of specialized gymnasiums. The VET institutions represent 98.6% of united schools, 96.2% of professional gymnasium, 96.0% of sport schools, and 69.7% of art schools.

20% of kindergartens still lack open air sport facilities – a key element of a direct learning environment &
70.6% of kindergartens do not have interior sports facility. (MOES 2020)

In majority of the cases ECEC institutions completed simple rehabilitation of open-air sports facilities and playgrounds signaling for lack of conceptual investments in playgrounds. In terms of outdoor facilities, 50,8% of ECEC institutions conducted partial repairs. However, these included just simple replacement of flooring or painting and/or replacement of the fences, either than the introduction of conceptually new learning environments. Among those institutions, which have this facility, 20.9% completed major renovations of gyms. Again, according to the research studies, the indoor space for physical activity and availability of physical activities in curricula might improve learning conditions for children in ECEC settings (Blackmore et al., 2011).

It is also important to highlight, that 19.9% of ECEC institutions in Bulgaria do not have an outdoor sport or playground facility at all. This is crucial because there is a growing body of research that confirms the connection between the physical activity of the children and their brain development, as well as learning achievements (Hillman, 2011). Thus, the presence and design of outdoor areas should facilitate these developments. The outdoor areas should provide the children with a variety of equipment and spaces to perform different physical, social, creative and sensorial games. The children should be able to use the playground for group activities, but also quiet games alone. The play area should be connected with the surroundings, reflect the natural terrain, provide safe and equal access to all the children. The playground and related equipment with the specific elements, which stimulate acoustic, visual, tactile and olfactoric senses, can support healthy child development (Broto, 2012). Several examples of such an outdoor environment in the kindergartens in Denmark are presented below. Additionally, the availability of the outdoor environment becomes even more important in the context of COVID-19, because the ECEC institutions might shift the number of activities to the outdoor learning environment to maintain health benefits for the children (Lawson Foundation, 2020).

In the same time almost two-thirds of Bulgarian ECEC institutions lack interior sports facilities. According to the MOES data, 70.6% of kindergartens do not have a closed sports facility. Indoor space design in preschools might provide a good opportunity to promote physical activity, interaction and learning. Based on the evidence of missing outdoor activities and limited acceptance of indoor space for sport, MOES and Ministry of Health should prioritize investments addressing stimulus to preschools and the need to promote physical activity in preschool. LE investments should be done in connection to age appropriate pedagogy and life skills development.

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Examples of ECEC learning environments in Bulgarian preschools collected during the piloting of questionnaire for principals

Indoor sport places and combination of sleeping and physical spaces Finland

Corridors as space for phisical activity Finland

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Examples of ECEC playgrounds Denmark

Playground in kindergarten Drejens, Denmark, source: Broto, 2012

Playground in kindergarten Forfaterhusset, Denmark, source: www.archdaily.com

59.5% of primary schools, 39.6% of basic and 43.8% unified schools do not have open air sport facilities. (MOES 2020)

Among the schools, which do obtain open sport facilities, approximately one-third completed the partial renovations, which includes only painting or replacement of the open sports facility elements. Open sport facilities are rehabilitated in primary (13.6%), basic (30.7%), secondary (26.2%), and specialized gymnasiums (42.1%). The following types of institutions providing VET completed renovation of open sport facilities: united schools, (44.4%), professional gymnasiums (19.2%) and art schools (17.4%). Closed sport facilities have been subject of major renovations. Closed sport facilities are rehabilitated in primary (17.5%), basic (19.5%), secondary (34.5%), profiled gymnasiums (35.8%). The following VET institutions completed the overhaul of interior sport facilities: professional gymnasiums (25.9%), united (2.7%) and art schools (39.1%).

MOES data reveal that 68% of specialized sports schools do not have access to open sports facility, as well as 60% are missing the closed sports facility. Overall, the MOES review analyzed 25 sport schools across the country. The data shows that 68% of these schools do not have access to open sports facility, while 60% are missing the closed sports facility. This lack of sport facilities might be explained by the fact, that these schools are using external sport facilities available in the municipalities (e.g. sport fields or swimming pools). At the same time, 20% of sports schools upgraded its outdoor sport facilities and 12% closed sport facilities.

Open sport facilities are unevenly distributed across schools questioning the application of the concept for the 21st century skills promotion especially in the domain of healthy life and promotion. The availability of open sports

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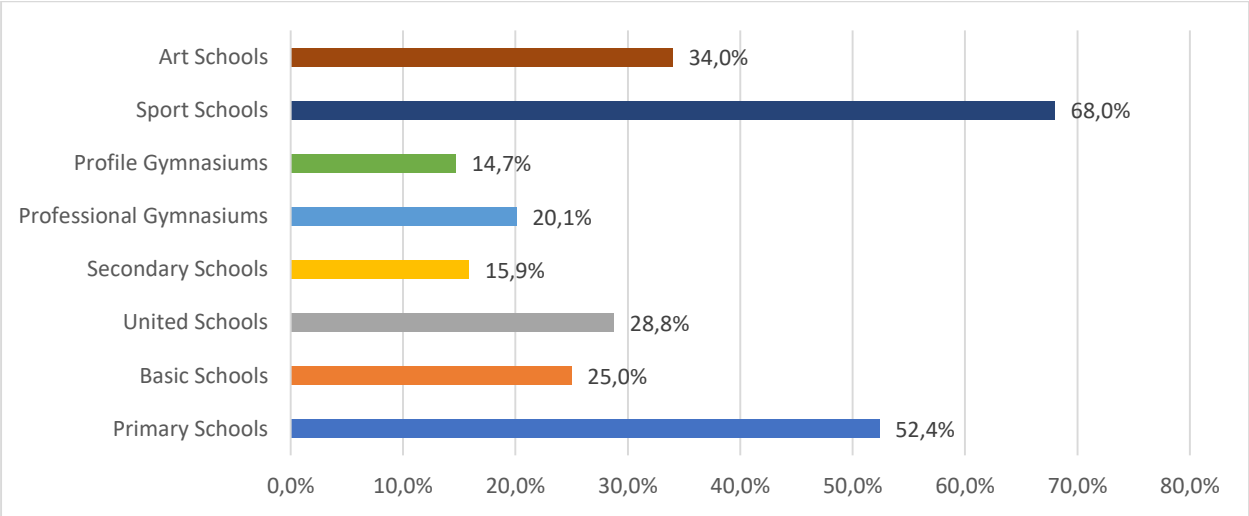
facilities, as well as closed sports facilities remains an issue for a small group of general education and VET institutions. According to the MOES data, there is no available open sport facility at the primary (52.4%), basic (25%), secondary schools (15.9%), profiled gymnasiums (14.7%). Among VET institutions these are professional gymnasiums (20.1%) and art schools (34%). In terms of closed sports facilities, the second-biggest share of schools, which do not have these learning environments belongs to the primary (59.5%), basic (39.6%). The VET sectors are represented by unified schools (43.8%), professional gymnasiums (20.9%), and art schools (26%).

Figure 19. Proportion of GE and schools proposing Vet education, which are lacking open sport facilities



Source: MOES data, authors' calculations

Education clearly plays a role in obesity prevention. Bulgaria's rate for obesity body mass index[27] for adults is above EU average and is growing. According to European Health Interview Survey[28] data in almost every EU Member State for which data are available, the share of obesity decreases with education level. In the difference in obesity between adults with a high educational level and those with a low educational level was 6.8%. MOEs and MH should consider options for promoting policies and actions at the school level including by combining non-traditional practices and investments in LE.

[27] % of population aged 18 or over. The indicator measures the share of obese people based on their body mass index (BMI). BMI is defined as the weight in kilos divided by the square of the height in meters. Eurostat https://ec.europa.eu/eurostat/web/products-datasets/-/sdg_02_10

[28] 203/2016 - 20 October 2016, European Health Interview Survey

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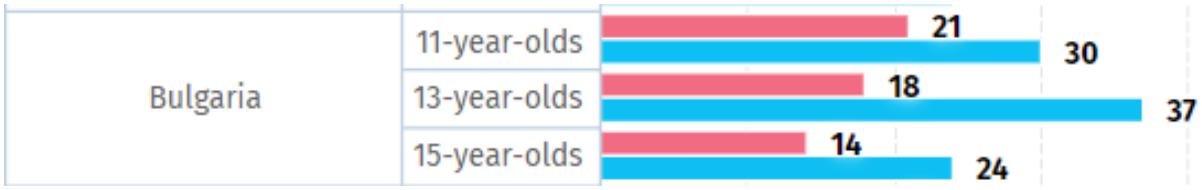
Share of obese adults in the EU Member States, by education level, 2014 (%)

	Total (adults)	of which:		
		Low education level	Medium education level	High education level
EU	**15.9**	**19.9**	**16.0**	**11.5**
Belgium	14.0	19.5	13.4	9.8
Bulgaria	14.8	17.2	15.3	10.4
Czech Republic	19.3	22.6	20.5	12.5
Denmark	14.9	21.9	16.0	11.3
Germany	16.9	21.4	18.0	13.1
Estonia	20.4	22.6	21.3	17.6
Ireland	:	:	:	:
Greece	17.3	22.3	14.4	13.4
Spain	16.7	22.6	12.3	9.6
France	15.3	20.9	15.2	8.8
Croatia	18.7	24.9	18.9	12.6
Italy	10.7	14.2	8.0	5.8

Source: European Health Interview Survey

The absence of sport facilities and, thus, lack of space for physical exercises and activities integrated into typical school day and in many cases in the curricula might impact overall health conditions of children. This is important in connection with the latest international data on health of school-aged children, which show decline in physical activities, growth of obesity and poor nutrition habits among the children all over the world. According to the WHO data, there is only 51% of young people in Bulgaria who participate in vigorous physical activity for two or more hours per weekday. At the same time, the children spend more time sitting: for example, 52% of schoolchildren use the computer for two or more hours during the weekday, while 62% use computers/game consoles for two or more hours every weekday.[29] Levels of overweight and obesity are rising and there is a significant difference among girls and boys in the level of obesity in Bulgaria (see the Figure 20).

Figure 20. Proportion of young people who are overweight or obese by gender



Source: HBSC, 2018

[29] https://gateway.euro.who.int/en/datasets/#hbsc

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At the preschool level, 32% of institutions organized areas for the children with SEN, while 27.9% upgraded the furniture and equipment. 79.2% of secondary schools established special environments for SEN needs. (MOES 2020)

One-third of ECEC institutions introduced the elements of learning environments, which support the inclusion and allow the pedagogical practices with the children with SEN. At the preschool level, 32% of institutions organized the areas for the children with SEN[30], while 27.9% upgraded the furniture and equipment in the learning spaces dedicated to inclusive education[31].

The biggest focus in developing inclusive spaces remains in secondary schools, as well as basic schools and professional gymnasiums. According to the MOES data, 79,2% of secondary schools established the dedicated spaces for the work with the children with SEN, while 58,2% upgraded the furniture and equipment related to inclusive education. 49.5% of basic schools established the rooms for the children with SEN at their premises and 33.8% upgraded the furniture and equipment. Among the VET institutions, 53.4% of united schools and 32.8% of professional gymnasiums also have the rooms for children with SEN. On the contrary, only 8.7% of art schools renovated spaces for inclusive education. Further analysis is needed to observe the geographic distribution based on national education strategic priorities on inclusion and support the planning. WB team stands ready to support MOES in this direction when specific information on the planning and/or distribution or needs is provided.

VET and practice base spaces have been renovated in 21.5% of professional gymnasiums and 16.4% of united schools renovated spaces for practice. Only the following general education institutions, such as primary and basic schools do not have practice base available at their premises. While the statistics provide the overall information on partial and major repairs of practice base, it is not clear which elements of practice base (e.g. special workshops) were subject of renovation. The data provided by the MOES is limited and more information on the spatial layouts

Equipment and furniture for digital classrooms are increasingly influencing school education. (MOES 2020)

of practice bases, as well as the perception of key users (students and teachers) are needed in order to obtain overall picture on practice base developments.

Almost all educational institutions implemented some upgrade of equipment and furniture for digital classroom. In general education sector, the biggest share belongs to specialized gymnasiums (68.4%) and secondary schools (53.9%), followed by 36.5% of primary, 36.1% of basic. Among VET institutions, 31.5% of united schools, 36.6% of

[30] Here we refer to “Помещения за работа с деца със специални образователни потребности”
[31] Here we refer to “Помещения за приобщаващо образование”

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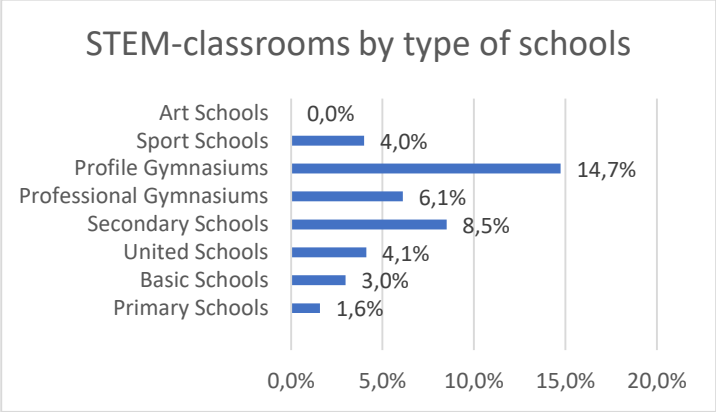
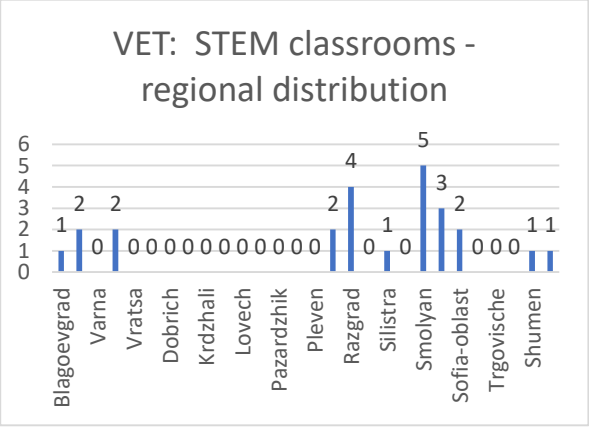
professional gymnasiums, 48.0% of sport schools, and 69.7% of art schools implemented these upgrades. The information digital equipment upgrade was not provided for the preschools.

The new STEM priority that MOES is promoting, requires systemic investment and planning. Less than 2% of primary schools have STEM environments. MOES has not collected data on preschools and is not addressing them currently with STEM program options. (MOES 2020)

The proportion of STEM-classrooms varies across different types of school institutions but overall the usage of school LE as STEM-centers remains unclear and requires detailed analysis of space use. During the last years, some schools established separate STEM-classrooms or dedicated specific classes for the STEM areas. The biggest share of the STEM-classroom belongs to the specialized gymnasiums (14,7%), which is explained by their learning profiles. 8.5% of secondary schools obtained this learning area, following by the VET sector represented by professional gymnasiums (6.1%), unified schools (4.1%) and sport schools (4%). There is almost no STEM classrooms in primary (1.6%) and basic schools (3%).

Figure 21. STEM-classrooms by type of schools





Source: MOES data, regional distribution is provided for professional gymnasiums

MOES identifies the STEM center as “a collection of several classrooms and areas with a common focus”. To support the systemic development of STEM-centers, it is important to monitor how the existing or newly created LE are used in terms of learning process organization, innovative teaching methods (especially with the focus on group work and team teaching, as it considered to be effective in improving learning outcomes of students, especially coming from low socio-economic backgrounds) , availability of technological equipment, cooperation with industry partners. International experience suggests that the following trends, listed below, are emerging in developing STEM-related facilities:

- STEM concept is embedded into overall design of education facility and is not connected to one specific area (so called STEM school). This holistic approach allows optimal usage of space and availability for all students.

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- The teachers practice Expanded Learning Opportunity method, which entails the organization of learning outside of traditional classroom (please refer to review of Czech Republic OP in next chapter). Usually, these learning activities can be organized at the premises of industry partner and become a part of general education or VET curricula. In addition, there is a trend of using university laboratories to conduct STEM-lessons for school pupils or VET students. In some cases, these lessons can be conducted between a school and a university through the virtual technology tools.

These approaches could be included in the open calls for possible project activities for schools and VET institutions under the national program on STEM.

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2.3. Direct Learning Environments in Bulgaria: the institutional perspective

To complement MOES administrative data and to allow for specific observations of LE features, trends and needs, the WB team developed and communicated with the MOES a questionnaire addressing principals of preschools and schools, and communicated proposals for the implementation steps based on questionnaire's electronic distribution using MOES digital platforms. As of delivery date of this report the electronic questionnaire implementation has not started due to MOES procedures needed on electronic platform access. The WB team will continue the process and stands ready to apply this instrument following a special request for extension of the deadline for this specific activity that will enrich MOES knowledge and planning information for LE.

This section presents the approach and methodology of analyzing the existing stock of LE through the survey of school users, namely school principals. While the MOES data analysis provided the objective structural data on the renovations and availability of certain direct LE elements (e.g. STEM-classroom), the survey will allow us to collect the data on user's subjective perception of and satisfaction with LE. This is usually a self-reported measure typically obtained through the questionnaire or/and a focus-group interview. The following practice is currently used as an official procedure in some countries (such as Australia, New Zealand, United Kingdom, Scotland, OECD) to assess the quality of existing physical LE and take investment decisions in education infrastructure development.

To complement the MOES administrative data collection on LE investments and major renovations in the preschool, general school and VET school education in Bulgaria, the WB developed a questionnaire to evaluate the perception, use and satisfaction level of school's users in relation to LE. The development of the instrument reflected three key elements relevant for LE analysis in Bulgaria – international knowledge and instruments, strategic policy planning for 2021-2027 and the initial planning on ESF 2021-2027 programming. More specifically, the questionnaire is based on selected questions from the OECD School User Survey for the school leaders, which is a self-assessment tool created by OECD Learning Environments Evaluation Platform (LEEP)[32]. This instrument is publicly available and designed to assess the opinions on school infrastructure of the key users' groups: students, teachers, school principals. The current questionnaire will only address the school principals due to the limitation of time for the research activity. Besides, the questionnaire reflects and collects information on MOES planning for the Strategic Framework for the Development of Education and Training in the Republic of Bulgaria (2021-2030). It collects the information to support the following strategic priorities:

- Effective inclusion and lasting containment in the educational process: the survey will analyse the availability of preschool and school infrastructure elements, as well as its use, which helps to understand how to improve quality of LE;
- Realization in the professions of the present and the future: the questionnaire will assess the use of selected VET learning space;
- Motivated and creative teachers: the survey will provide a brief insight on how LE impacts the retention of the teachers from the perspective of the school principal;
- Digital transformation: the survey will evaluate the availability and use of ICT equipment by teachers and pupils;
- Innovative education: the survey will identify the needs of schools to establish innovative LE;
- Green educational environment: the survey will collect the information of teacher's perception of the Green School concept and identify existing elements of the Green educational environment.

[32] http://www.oecd.org/education/effective-learning-environments/OECD-School-User-Survey.pdf

Finally, it reflects the first draft of ESF co-funded Operational Program for education in terms of collecting data to inform the following OP priority areas:

- Priority 1 “Inclusive education and educational integration”: The questionnaire collects data on availability of LE elements supporting the children with special educational needs and analyzes the use of selected learning spaces by the teachers, as well as the overall satisfaction with selected learning spaces. The assessment of teacher practices performed in the different typologies of LE, as well as teacher’s satisfaction might provide additional information for supporting the personal development of pedagogical staff in schools;
- Priority 2 “Modernization and quality of education”: The questionnaire collects information about the availability and use of different learning spaces, ICT equipment, which helps to identify the limitations in the existing LE and ways to improve its quality;
- Priority 3 “Relationship between education and the labor market”: The questionnaire collects the data on the availability and the use of VET-related LE (e.g. special workshops, STEM-classrooms).

The questionnaire is available in Annex 1.

The target audience of the survey are all preschool and school principals from in Bulgaria, including the representatives of VET institutions. The survey is targeting the full list of preschools and schools in order to provide information for the development of the LE mapping instrument. The questionnaire aims to (i) collect information and understand the structure and use of preschool/school LE, (ii) as well as information to inform the typical learning spaces’ typology, (iii) the allocation of learning spaces for the teacher by the school principal; (iv) investigate the linkages between teaching methods and supporting learning spaces, as well as furniture, and (v) analyze the use of available ICT technology. The survey[33] contains dichotomous (‘Yes/No’), multiple-choice, and rating scale questions that follow a detailed list of LE elements and is checking on key concepts reflecting MOES planning and ideas.

Adjustment to the instruments have need introduced following pilot testing in August 2020. Following technical consultations with the MOES and EA representatives[34] a pilot testing was organized in order to reflect on key discussion topics raised during meetings, to test the instrument and its relevance in the direct environment of schools and preschools and to identify the need for additional or specifying questions. 16 Bulgarian kindergarten and school principals took part in the pilot testing in August 2020.
The table below describes the profiles of the participating educational institutions:

Table 2. The participants in questionnaire’s pilot testing

Type	Location	Name of the institution
VET	Sliven	"Dobri Zhelyazkov" Vocational school for textile and clothing
VET	Pazardzhik	Vocational High School of Chemical and Food Technologies
General education	Selanovtzi	Nikola Vaptsarov Primary School
General education	Dolni Tzibar	Hristo Botev United School
General education	Dhulyunitza	United school "PR Slaveykov"
General education	Pavlikeni	Bacho Kiro High School
General education	Omurtag	2nd Elementary School "Vasil Levski"

[33] The questionnaire contains 21 questions and is divided into two thematic sections: Administrative Data and Learning Environments.
[34] The meetings were conducted on July 20, 2020; July 23, 2020 and August 19, 2020

General education	Kaspichan	Hristo Botev United School
General education	Shumen	6th Primary school "Enyo Markovski"
General education	Sotirya	St. Paisii Hilendarski Primary School
General education	Karadjovo	Vasil Levski Primary School
General education	Sofia	75th Primary school "Todor Kableshkov"
ECEC	Gorna Oryahovitsa	Kindergarten Elena Grancharova
ECEC	Yambol	Kindergarten "Prolet"
ECEC	Ivanski	Kindergarten "Snezhanka"
ECEC	Lukovit	Kindergaten "Slantze

An electronic version was delivered to the principals (by e-mail) and they were asked to fill and email back the form. In addition, two online focus-interviews were conducted to discuss the abovementioned questions regarding the survey. After the pilot testing the following adjustments to the questionnaire have been introduced and the final draft of the questionnaire was shared with MOES on September 3, 2020. The team introduced the following key amendments to the survey:

- Amended Sections 1 “Administrative Data” with two separate sets of questions addressed to preschool and school principals regarding class capacity, use and rehabilitation of playrooms and classrooms;
- Introduced a sub-set of questions regarding pre-school groups addressed to school principals;
- Updated the approximate time for completing the questionnaire to 30-40 minutes;
- Revised and unified all definitions of LE elements for both preschool and school in Section 2 “Learning Environments”;
- Added additional items to the list of preschool/school spaces to be analyzed as LE;
- Introduced an empty section in the end of the questionnaire, where the respondents can provide their comments regarding their own learning environments in the open format;
- Introduced a specific limitation to the visual information: the visual representation should exclude students and children in order to (1) guarantee full visibility of LE, and (2) avoid identification of persons on the pictures.

The instrument is making a special effort to complement the questions with visual information on direct LE by collecting photos on the following direct LE elements: (i) a typical playroom/classroom/learning space; (ii) a learning space that represents the Green School concept; (iii) a corridor or hall used for teaching/learning activities. Additionally, the VET institutions have to provide a picture of a typical workshop space. This collection aims to create a specific data repository for MOES to be applied for direct planning and evidence on planning choices. The visual information will serve as an added value for the learning environment analysis, as it will typical typologies and furniture/outdoor spaces layouts.

To illustrate the possible visual collection, the Table below represents a selection of LE elements from the survey piloting round. The selection is done according the educational level of institutions and the type of direct LE. The separate section represents VET institutions, as no Green School elements were provided for this type of education facilities:

Visual examples of learning environments elements to inform typology of schools and planning

Educational Level	**Playroom/Classroom**	**Green School**	**Free Space**
ECEC			
General Education			
	Clasroom	**Workshop**	**Free Space**
VET			

Finally, the box below represents basic planning of the scope of analysis based on LE questionnaire data as of August 30th, 2020.

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Direct LE findings: basic scope of analysis

The proposed questionnaire will generate the information on direct LE in two groups of educational institutions: ECEC and schools (including VET or with VET component). The following data will be collected across the following topics and will contribute to the overall analysis of LE in each group of institutions:

1. *Prevalent layout of playrooms and classrooms*. The layouts will be analyzed based on the 6-types-typology starting from traditional room/corridor system to the open space LE. This data will help to understand the range of spaces available in the schools for teachers and students.
2. *Existing learning spaces and its daily use by the teachers*. The respondents will have to provide the information about the use of selected learning spaces for teaching purposed in preschools and schools. This data will help analyze the potentials and limitations of existing material environment and promote active use of space for learning and play activities.
3. *Prevalent teacher practices*. The analysis will be built across 4 types of teaching/learning styles: frontal, group work, individual work and team teaching, as well as supporting furniture arrangements of the learning spaces. These findings will help understand the typical teacher/students' interaction practices and availability of supporting LE for that. Learning spaces management among teachers.
4. *Impact on teacher motivation and retention*. Through these questions, the school principal will provide their opinions whether the existing LE can positively contribute to the improvement of teacher motivation for work and teacher's retention.
5. *ICT equipment availability.* These data will help to briefly investigate the use of available ICT infrastructure for teaching.
6. *Green School concept and elements of LE.* This focus area is aligned with the priorities of the National Strategy for Education Development till 2030. The aim is to understand whether school principals are familiar with the concept of the Green School. The data will provide insight whether these education institutions have some elements present in LE already.
7. *Innovation playroom/classroom future needs.* Similar to above, this thematic scope addresses the national policy on development of innovative learning spaces in the Bulgarian educational institutions. The aim is to collect the opinions of the principals and understand the needs of preschools/schools in creating this type of LE.
8. Overall, this data will be useful for education policy officers, education facility planners and education institution principals to plan, develop, maintain and efficiently use LE in their respective organizations.

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III. ESF investment trends in learning environments and lessons of 2007-2013 and 2014-2020

3.1. European Union policy priorities in skills development and competency-based learning

In the European Union, skills development and establishment of competence-based learning are considered important conditions for achieving the priorities of EU 2020 Strategy for a smart, sustainable and inclusive growth, which target the increase of employment, decrease of early school leavers and protection from poverty[35]. To enhance the social dimension in the policies of Member States, the European Union established the European Pillar of Social Rights to create more social Europe and stimulate greater investment in people. The ESF is one of the European Structural Investment Fund programmes (ESI) and serves as a key instrument to translate the EU strategic policy priorities in smart, sustainable and inclusive growth, including skills development, as well as to implement the European Pillar of Social Rights. The ESF provides special thematically targeted funding to the Members States for 7 years programming period. The ESF identifies a set of thematic objectives for funding, as well as a set of investment priorities under each objective.

The Operational Programmes (OPs) serve as a link between the Europe 2020 Strategy and the ESF. The Member States develop special detailed plans, which describe how and for each thematic field the EU budget funds will be used during the programming period. Channeling the ESF funds, the OPs fund variety of projects which are run by a range of public and private beneficiaries[36]. Each OP identifies the priority axes, which normally cover only one thematic objective of ESF and a single category of region. However, it is possible to combine investment priorities under different thematic objective[37]. The European Union completed two programming periods of ESF funding for 2007-2013 and 2014-2020. In 2018-2020 a new ESF+ fund proposal was adopted by the European Commission, which stipulated the merging of several structural investment funds and programs under one umbrella of ESF and introduction of special policy priorities in order to combat the socio-economic impact of COVID-19 in Europe.

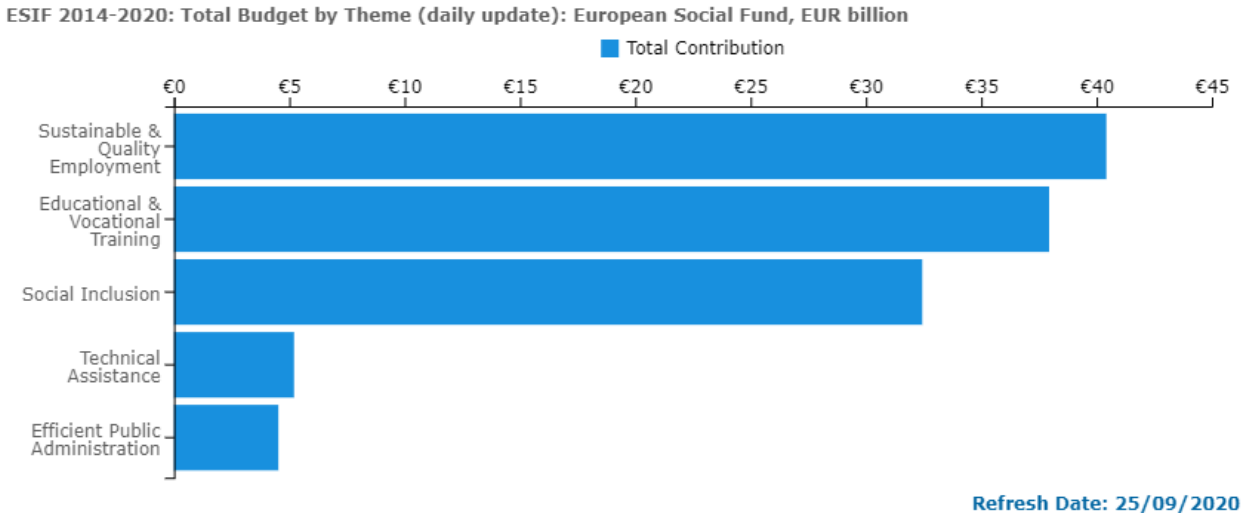
According to the latest statics on ESF implementation for second programming period of 2014-2020, the amount of investments in education, training and vocational training, as well as life-long learning represents the second biggest share of funding from the EU to Member States. The total amount of money for second priority is equivalent to about 38 billion Euros. The detailed information is described in the Figure 21 below:

[35] COM(2010) 2020 URL: https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf

[3636] https://ec.europa.eu/esf/main.jsp?catId=525&langId=en

[37] DG Employment. (2018). Programming period 2014-2020. Monitoring and Evaluation of European Cohesion Policy. European Social Fund. Guidance document. URL: https://ec.europa.eu/sfc/en/system/files/ged/ESF%20monitoring%20and%20evaluation%20guidance.pdf

Figure 21. ESIF: Total Budget by Theme, European Social Fund



Source: European Structural and Investment Funds Data, https://cohesiondata.ec.europa.eu/funds/esf

The ESF thematic objectives under the education and vocational training theme have varied during various programming period and has never addressed the improvement of learning environments directly. According to the comparison presented in Table 3, the focus of ESF has shifted from more broad investments into human capital into details support of all education sectors starting from ECEC to adult education focusing on equality, labor market relevance, and inclusion of the most vulnerable groups. If we consider LE as a key structural element of education and training system, then the priorities under the Second programming period of 2014-2020 and ESF+ proposal could be covered indirectly under the thematic objective on improving the quality and effectiveness of education and training systems. The ESF Regulation for second programming period of 2014-2020 sets out the following four thematic objectives:

- Promoting sustainable and quality employment and supporting labour mobility;
- Promoting social inclusion, combating poverty and any discrimination;
- Investing in education, training, and vocational training for skills and life-long learning;
- Enhancing institutional capacity of public authorities and stakeholders and efficient public administration[38].

[38]https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2013.347.01.0470.01.ENG

Table 3. Comparison of thematic priorities in education for different programming period

First programming period 2007-2013[39]	Second programming period 2014-2020[40]	Proposal for ESF+ [41]
(a) *expanding and improving investment in human capital*, in particular by promoting: (i) the implementation of reforms in education and training systems, especially with a view to raising people's responsiveness to the needs of a knowledge-based society and lifelong learning; (ii) increased participation in education and training throughout the life-cycle, including through actions aiming to achieve a reduction in early school leaving and in gender-based segregation of subjects and increased access to and quality of initial, vocational and tertiary education and training; (iii) the development of human potential in research and innovation, notably through post-graduate studies and the training of researchers;	For the thematic objective *'investing in education, training and vocational training for skills and life-long learning'*: (i) Reducing and preventing early school-leaving and promoting equal access to good quality early-childhood, primary and secondary education including formal, non-formal and informal learning pathways for reintegrating into education and training; (ii) Improving the quality and efficiency of, and access to, tertiary and equivalent education with a view to increasing participation and attainment levels, especially for disadvantaged groups; (iii) Enhancing equal access to lifelong learning for all age groups in formal, non-formal and informal settings, upgrading the knowledge, skills and competences of the workforce, and promoting flexible learning pathways including through career guidance and validation of acquired competences; (iv) Improving the labour market relevance of education and training systems, facilitating the transition from education to work, and strengthening vocational education and training systems and their quality, including through mechanisms for skills anticipation, adaptation of curricula and the establishment and development of work-based learning systems, including dual learning systems and apprenticeship schemes;	(iv) improving the quality, effectiveness and labour market relevance of education and training systems, to support acquisition of key competences including digital skills; (v) promoting equal access to and completion of, quality and inclusive education and training, in particular for disadvantaged groups, from early childhood education and care through general and vocational education and training, and to tertiary level, as well as adult education and learning, including facilitating learning mobility for all; (vi) promoting lifelong learning, notably flexible upskilling and reskilling opportunities for all taking into account digital skills, better anticipating change and new skills requirements based on labour market needs, facilitating career transitions and promoting professional mobility; (vii) fostering active inclusion with a view to promoting equal opportunities and active participation, and improving employability; (viii) promoting socio-economic integration of third country nationals and of marginalised communities such as the Rom

[39] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006R1081&from=EN
[40]https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2013.347.01.0470.01.ENG
[41] https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52018PC0382

A review of OPs 2014-2020 from selected comparator countries[42] demonstrates that OPs are guided to imply direct learning environments investments under *improvement of access to education* or overall *development of education institutions and network in terms of quality provision*. According to the education-focused priorities of OPs, Estonia and Slovenia tried to improve skills development, while Czech Republic focused the efforts mainly in provision of equal access to high-quality pre-school, primary and secondary education, as well as university, science and research development. Overall, all countries targeted their efforts on preventing early school-leaving, improving the relevance of education and training for labor market, teacher's training, creating high quality education materials, and increasing the employment, especially of vulnerable groups of population (see Table 4 below). The selected priorities allowed Czech Republic and Estonia to implement the projects, which in addition impact LE development in all education sub-sectors, while Slovenia targeted general education, VET and university environment. All three OPs combined ERDF and ESF funding, while the ESF funding was specifically used for purchasing necessary equipment, learning materials and other aids to support education process, inclusion or teacher's training. The Summaries of the OPs for Czech Republic, Estonia, and Slovenia are presented in Annex 2.

Table 4. Overview of OP investment's priorities with potential impact on LE development

	Czech Republic	**Estonia**	**Slovenia**
Investment Priority (under ESF funding)	(1) to prevent early school-leaving and promote equal access to quality education, (2) combating all forms of discrimination and promoting equal opportunities and (3) socio-economic integration of marginalized communities such as the Roma.	(1) creating high-quality education support services, (2) improving teaching competence of staff and (3) introduction of innovative study materials	(1) to create better and more flexible access to education which in turn would upgrade the knowledge, skills and competences of students for the labor market in all levels of formal education, (2) modernizing the instruction in VET institutions.
Potential LE targeted	LEs in all levels of the education system (ECD, GE, VET, HE)	LEs in all levels of the education system (ECD, GE, VET, HE)	LEs in GE, VET, HE

The selected OPs identify different types of actions to be financed, which are quite comprehensive and might influence the development or change in existing LE in the educational institutions. The following key thematic areas could be identified thought all three OPs:

1. **Introduction of specific teaching tools and methods.** For example, Czech Republic planned to support actions to introduce teaching methods such as Expanded Learning Opportunities (ELO)[43], "Flipped classroom", teaching in

[42] Methodology for selection of systematic country comparators, 2020; A Roadmap to Teacher's Policy Development and reform
[43] Learning experience that takes place outside the traditional classroom, usually is very common for STEM-lessons, which are conducted at the enterprise's premises.

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mixed-age groups. The nature of methods inquires different approach to the use of existing learning environments (see Box 1 below). Slovenia planned the development of innovative LE and the introduction of teaching methods and practices through the integration of new technologies (e.g. the development of innovative learning materials, interdisciplinary subjects, new teaching models, new forms of learning such as group-based learning, social learning which is based on a networking approach and horizontal activities, the development of a higher education tutoring system).

Box 1. Flipped classroom layout and furniture example

Flipped classroom is a teaching method in which students first learn about a new subject at home, especially online, and then have group discussions on it in class. The teacher act as moderator/observer.
Source: OfficeLine, Australia

2. ***Development of training for teachers and school principals.*** These actions can include the introduction of new pedagogical methods in ECEC, general education, VET, higher education (all three countries), introduction to inclusion principles (Estonia), introduction to entrepreneurship (Slovenia), transition from preschool to primary school (Czech Republic), digital skills (all three countries). This could entail that the teachers will use and modify the LE in a different way to use it in accordance with new methods.

3. ***Improving the accessibility of educational institutions for children with SEN.*** These actions include upgrade of learning environments, rearrangement of the network (Estonia), provision of necessary trainings to educational and administrative staff, creation of school counselling facilities (Czech Republic, Estonia), purchase of necessary equipment (Czech Republic, Estonia).

4. ***Improvement of vocational education and employability of pupils.*** This focus area usually includes the establishment of career and educational guidance centers/services, continuous teacher education, the development of new methods, inclusion of entrepreneurs in entrepreneurship studies (all three countries).

5. ***ICT tools and digital materials upgrade and purchase.*** This focus area could include the development of digital tools for the specific groups of users. For example, Estonia planned the creation of digital aids for life-long learners, hobby schools, home-schooled children, Estonian schools abroad, etc.

6. ***Transition from preschool to primary education.*** This focus area is mentioned only in OP for Czech Republic and entails establishing cooperation between teachers in nurseries and primary school, teacher training, and development of methodological materials.

All the OPs imply the organization of open calls to finance different thematic projects (actions) under selected investment priorities and competitive selection of the projects, however it doesn't identify specific requirements for learning environments development projects. There are some guiding principles for selection, which only point out some specific requirements under certain specific objectives of OPs, coherence with national education policies and identification of target groups and beneficiaries. There are also the so-called "horizontal principles' (sustainable development, equal opportunities and non-discrimination, equality between men and women) for selection which apply for every project to be finance under the OP. These are cross-cutting, and not theme-specific, thus the details on individual

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projects selection are to be provided in the future calls for proposals. There is no specific requirement identified for learning environments, however it might appear in the detailed calls of proposals.

In terms of impact evaluation, the selected 2014-2020 OPs identify the list of results indicators under ESF funding, which are very broad, coherent with the specific objectives under investment priority and do not really reflect the characteristics of a particular LE, but rather the learning/teaching processes or outcomes. For example, Czech Republic identified the following indicators "Number of educators applying newly acquired competencies in practice" or "Number of organizations affected by systemic interventions" to be monitored monthly and compared to a benchmark of 2014. Estonia annually monitor the "Share of pupils in Grade 8 who are taught in schools where teachers use ESF supported ICT solutions in at least 25% of lessons" and compares it to the benchmark of 2012. Slovenia assesses the "Share of schools with successfully implemented flexible learning pathway strategies" and compares it with the 2014 data. The only indicator, which describes the physical amount of active learning environments is present in Estonian OP, but is related to ERDF-funded actions (upgrade of school facilities for children with SEN), not ESF-funded – "Square metres per pupil in schools that received support in the process or rearrangement of the education system".

Potential limitation of the ESF funding 2014-2020 and in the following funding cycles for LEs is that development of LEs will be simply a by-product of the projects implemented under the OP. Due to strict financial requirements, the investments in serious upgrade of educational facilities is normally done withing ERDF sources and ESF-funded actions usually accompany these projects and support these investments in infrastructure through the soft measures, e.g. modernization of in-service teacher training, improvement of teachers' skills, introduction of inclusion principles in learning, development and upgrade of learning materials, teaching aids, digital tools and related equipment. Since LEs are not a key focus for development in each education sub-sector (only Estonia planned the development of learning environments for the children with SEN and Slovenia targeted the development of innovative learning environments in VET) and do not appear in the selection criteria for actions, then the focus and decision making in regards to LE becomes the responsibility of the beneficiaries themselves when developing their projects. Therefore, some types of LEs will be dominating the ESF support whereas some would be under-represented. For example, in Slovenia it would probably be related to the classroom layout in general and VET schools as a result of introducing new teaching models and learning materials.

At the same time, the analysis of the ESF-funded projects at the level of the beneficiaries shows that ESF funds channeled through the OPs directly or indirectly impacted the development of LE in various educational institutions across Member States.[44] The project's information is available online in the database of ESF on the official web-page of the European Union[45]. A review of all 175 projects in the ESF database under the thematic section "Better education" funded and implemented during the first (2007-2013) and second (2014-2020) programming periods of ESF has been performed. The selection criteria included the following: i) projects, which envisioned change or had an impact on the physical LE (classrooms, furniture, equipment); ii) projects implemented in ECEC; general education (GE); VET; higher education sectors. Based on these requirements, we selected 53 projects for further analysis. In Annex 3 a full overview of the selected projects is presented.

Overall, four main trends cover LE development through the ESF during both programming periods of 2007-2013 and 2014-2020 influencing education investments: i) no direct funding for LE; ii) provision of upgrade of the equipment as a

[44] https://ec.europa.eu/esf/main.jsp?catId=51&langId=en
[45] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en

part of changing the learning process; iii) the teacher training programs might indirectly impact the use of existing LE; iv) majority of the projects listed in the database cover GE, VET and university sectors. At first place, the physical learning environments investments are embedded in priority topics addressing inclusion and quality of education. This trend is connected with the requirements for cost eligibility under the ESF, which restrict the purchase of furniture, equipment, vehicles, infrastructure, real estate and land. However, the latter also differs between the two programming periods, because the purchase of furniture and equipment is allowed in the second programming period.

Usually some upgrade of interior learning space or equipment is included in the projects, which envisage the change of learning process in the classrooms, workshops (VET) or laboratories (university). This includes the following activities: purchase of new equipment (e.g. tablets or robotic sets), creating of learning materials and functional temporal spaces (e.g. for career counseling services) within the educational facility, as well as the introduction of selected IT solutions or digital elements of a virtual LE. Box 2 presents selected examples of project type.

Box 2. Examples of ESF-funded projects, which envisage the change of physical learning environment

In Cyprus, the Cypriot Ministry of Education, Culture, Sports and Youth, launched a project DRASE in over 100 schools, which aimed at preventing social exclusion, especially the pupils at poverty risk, through the art and creativity. In the framework of the project, the Ministry established new learning and creativity programmes, provided access to new information and socio-emotional support centres, **purchased new school equipment and educational materials**, and training programmes for teaching staff.[46]

In Croatia, in the framework of ZADARZaDar project, the Bartol Kašić elementary school created new teaching materials for local schools, as well as an **online platform where teachers can collaborate.**[47]

In Poland, the Medical University of Gdansk **created 35 new teaching rooms (New Center of Medical Simulations)**, where students can practice on lifelike medical mannequins which mimic real symptoms and behaviors – breathe, cry and bleed.[48]

The projects, which have a component on teacher's training and capacity indirectly provide for the change of LE. LE may remain the same, but the new teaching skills acquired by the teacher lead to the situations when the teachers have to re-arrange the classroom furniture and other elements of the environment. Overall, the change in LE arrangement usually follows as a result of new curricula implementation, the introduction of new teaching methods or teacher's re-training. Box 3 presents selected examples of project type.

Box 3. Examples of ESF-funded projects, which target teacher training

In Slovakia, the Ministry of Education, Science, Research and Sport of the Slovak Republic launched the project "School open to everyone" aimed to support inclusive education and **improve the professional competencies of pedagogical staff and professional staff** to ensure equal access to quality education and to improve the results and competencies of children. The target group of pupils were the children from Roma communities. Approximately, 2000 education specialists passed through special certification during the project.[49]

[46] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=3621
[47] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=3560
[48] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=3657
[49] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=2877

In Poland, the school No 26 in Toruń and Toruń Municipality implemented the project "I talk though I don't speak – alternative methods of communication for pupils of school No 26 in Toruń" aimed to create **a systematic approach to address children with SEN' communication problems.** Each pupil had his or her own 'communications book' adapted to their own circumstances and abilities. The book consists of independently created pictographic representations of school-based themes – such as class timetables and school regulations. **21 teachers and therapists were trained** as well and able to broaden their teaching experience and gain professional qualifications.[50]

Based on the project data presented in the ESF database, there is a lack of information about the projects in the ECEC institutions, which directly or indirectly target LE. The majority cover some changes in LE for GE (e.g. STEM-classrooms), VET and higher education sectors (e.g. science laboratories). We examined the same trend during both programming periods of ESF, however, in the second programming period, some GE institutions have VET component in their projects. However, the prior analysis of selected national OPs suggests that these education sectors fall under policy priorities and these findings might be due to a limitation of the project information publicly available in ESF-database.

Box 4. Examples of ESF-funded projects, which target higher education

In Hungary, the University of Miskolc completed a project to improve research capacity of the university and to enhance knowledge and technology transfer in the areas of research, development and innovation. The project targeted existing center of research excellence.
The project included the development of the **university's laboratory infrastructure** and equipment, the development of an advanced computer network and the strengthening of its international network of scientific institutions.

During 2007-2013 the ESF-funded projects mainly introduce new learning courses or extracurricular learning activities in general education or higher education institutions. Among all the projects presented in the ESF database, the majority covered GE and higher education sectors, while early childhood development initiatives remained limited. Under this programming period, 33 projects in 14 countries have been reviewed of total euros 607 477 998 invested as ESF co-funding. Four projects comprise of 90% of total funding, whereas one of them alone is worth euros 419 600 000. In terms of educational level, 67% of the projects dealt with general education and another 20% cover the universities. The limited number of projects presented in the database for this programming period covered ECEC institutions. The main focus area of ESF-funded projects in first programming period of 2007-2013 is human capital development. According to the ESF regulations for the first programming period of 2007-2013, the projects aimed to enhance human capital development, mainly through the design and introduction of reforms in education and training systems. The focus of this ESF stream was to increase the employability of future graduates, to support the development of skills for innovation and a knowledge-based economy, to target early school leavers and guarantee equal access to the initial, vocational and tertiary education. In terms of expenditures, the purchase of furniture, equipment, vehicles, infrastructure, real estate and land were not considered as eligible for a contribution from the ESF[51].

The new learning activities and teacher retraining completed in the framework of the projects most likely impacted and changed the way the existing LE was used. The reviewed projects mainly covered the introduction of new learning courses or extracurricular learning activities, which probably envisage the different usage of the existing learning environment. In

[50] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=324
[51] Regulation (EC) No 1081/2006 of the European Parliament and of the Council of 5 July 2006 on the European Social Fund. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006R1081&from=EN

terms of an indirect impact, some projects targeted the improvement of teacher's skills, which, as we assume, will affect the usage of the existing LE and might stimulate future changes in the furniture arrangements or selection of learning spaces for teaching activities. Few projects introduced the change to the physical LE, including the creation of laboratory infrastructure, the purchase of IT solutions for learning processes, creation of a digital platform, purchase of teaching materials and equipment. One project combined the funding with the European Regional Development Fund (ERDF) grant, which allowed buying new infrastructure and equipment for workshops and laboratories for the vocational schools.

In comparison, during 2014-2020 period, the ESF-funded projects included more activities targeting the skills development, labour market relevance of education and social inclusion where the general education and higher education sector remain main beneficiaries. There are 20 projects in 14 countries of total euros 106 079 080 invested as ESF co-funding. Five projects comprise 85% of the total funding and the only common factor amongst them is the country of origin: all were from member states joined in 2004. In terms of educational level, 50% of the projects dealt with general education, and universities had another 25. There is limited number of projects initiated by the ECEC and VET institutions in the reviewed ESF-database. However, the projects initiated by general education institutions had mostly VET-related components. As for the aim of the projects, two-thirds targeted good-to-great improvements such as promoting high-level achievements of students, whereas the other third targeted the students at risk of drop out and poverty or minority groups. The thematic focus of the second programming period has expanded to all levels of education and followed the concept of life-long-learning and labor market relevance, as well as targeted inclusion of the most vulnerable groups of children. During the second programming period of 2014-2020, the education projects had to follow the thematic objective of *'investing in education, training and vocational training for skills and life-long learning*'. The ESF again supported the projects, which have a focus on prevention of early school-leaving and guarantee access to the good quality early-childhood, primary and secondary education. Special attention was given to non-formal and informal settings for learning. Besides, again a big focus was made on enhancing the labor market relevance of education and training systems, including VET, and skills development.

Two-thirds of the projects directly change the physical environment either permanently, such as updated equipment and classroom, or temporary, through the introduction of new learning activities or outside the school (e.g. clubs for extracurricular activities or career counseling centers). In terms of expenditure eligibility rules for second programming period, the restrictions were eased and forbid only the purchase of infrastructure, land and real estate from the ESF funds.[52] However, the funding conditions for each reviewed projects require further investigations and additional information from projects applications. Almost half of the projects targeted improvements in the classroom and the rest dealt with improving equipment (computers, tablets) and workshops (VET learning spaces). As the purchase of equipment was allowed during this programming period, we examine more projects with this element. The indirect impact is mostly related to building the capacity of teachers who are also a crucial factor in facilitating interaction within LE. The teachers can improve learning outcomes by facilitating better interaction with the existing learning environment. Therefore, it is not necessarily a physical change that occurs in the learning environments per se. Only a third of the projects had specific instruction that envisions teacher's training. The effects of such training potentially multiply the effectiveness of investments in learning environments.

[52] Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013R1304&from=EN

3.2. Selected examples of ESF-projects targeting physical learning environments

This section provides more detailed overview of selected projects funded by the ESF. The aim is to illustrate the activities and explain how the project targets the learning environment and follows ESF regulation. Four case-studies were selected to represent the projects, which finance any change in existing learning environments. The key selection criteria were: i) approved funding during the last financing period of 2014-2020; ii) clear and observable change in the physical learning environment usage (including learning space, furniture, equipment); iii) projects covering at least one of the following sectors: ECEC, the general education and VET; iv) represent different type of beneficiaries. The information was obtained through the database of ESF projects under a thematic section "Better Education" available on the web-page of European Commission, as well as on the web-pages of the projects or beneficiaries.[53] It's important to mention that the information provided by these resources is limited and the data regarding project indicators or full project concept and technical documents are not fully available.

The project described in Box 5 fully follows the ESF 2014-2020 thematic priority on skills development and the provision of good quality general education. The physical learning environment of the classroom is upgraded in terms of new equipment provision, which is in line with ESF 2014-2020 cost eligibility requirements. This project improves physical learning environments directly, but also deals with building teachers' capacity and introduction of new teaching methods, thus influencing the already existing learning environments. Through the videos provided by the school, we can observe, that the teachers use more group work and collaborative discussions, as well as rearrange the furniture in the traditional classrooms to facilitate these activities.

[53] https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&theme=51

Box 5. Czech Republic, 2016 – 2019, General Education

Network Laborky.cz at the Grammar School in Slaný,

ESF contribution: € 1,180,045.00
Source: https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=3178
School web-page: http://010.laborky.cz/
Organizer/Beneficiary: The Grammar School of Václav Beneš Třebízský in Slaný

The project aims to expand the number of teachers and schools (mostly primary) which implement similar STEM teaching methods as the National Network Laborky.cz and share knowledge and experience within the network. Their goals are aligned with a Strategy of education policy issued by the Czech Republic. 42 partner schools and each partner school is joined by 5 other schools in the region.

The general idea is that every participating school receives a package including robotic kits, measuring systems and tablets with measuring software and in return, they are expected to conduct experiments of their own. The results and knowledge are shared with the network via video on their own website or YouTube channel where one could find more than 300 videos. Some of those tools are quite popular in teaching STEM globally such as Arduino and LEGO robotics kits.

This network started from only one school in 2009, before the commencement of ESF funding. It is aimed to continue to share and learn, building on their good work and transferring knowledge through preparing experiments, methodical practice papers, videos and webinars for participants every month and annual conferences. There is an increase in the number of schools participating in recent years.

Key lessons for Bulgaria:

- To use learning environment in its full potential, it is important to accompany it with the teacher's training and teacher knowledge exchange;
- To use various digital tools and social media to promote the activities and results of the projects, especially in promoting new teaching methods and practice of working with new learning environment.

Children are working with the robotic set in Grammar School in Slaný, Czech Republic. Official video.

The project described in the Box 6 follows the objective of ESF 2014-2020 related to the provision of equal access to quality general education, as well as the development of new skills. The purchase of the tablets and the creation of a digital platform go in line with the ESF 2014-2020 expenditures rules because this is considered as a piece of supporting

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equipment for the classroom. This project does not envisage any change to the physical learning environment of primary schools in Malta, however, it creates a virtual learning environment, which can be used as a complementary tool in and outside traditional classrooms after the pandemic is over. This is example of the project, where the federal ministry becomes a beneficiary of ESF.

Box 6. Malta, 2016-2021, General Education

One Tablet Per Child – OTPC

ESF contribution: € 9,600,000 (80% ESF)
https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=3718
Organizer/Beneficiary: Ministry for Education and Employment - Directorate for Digital Literacy and Transversal Skills

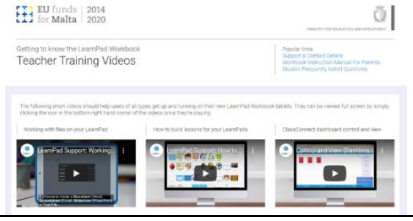
The goal is to digitalize the learning process for all primary schools in Malta, so that teaching and learning continues during the COVID-19 school closure. The investment covers the provision of tablets for every 4th-grade, 5th-grade and 6th- grade student, as well as the creation and support of a digital learning platform called Malta Digital Education portal[54].

Apart from the tablets (LearnPad Workbook 10.1) for the students, the schools also receive the necessary classroom management software, educational programs and applications, as well as staff training. On the platform, the teachers receive the instructions, access to teaching materials and space to share their experience (e.g. a blog). Students and parents have the access to instructions for better use of the tablets, explanation of features/apps and frequently asked questions. However, there is no specific virtual learning environment, where students log in on the platform. The learning environment for the students is the tablets themselves and the digital world they navigate in.

Since the start of the project, 11,479 tablets have been distributed and 2,000 educators across the country received the training on new digital skills. According to the project, the new framework will support Malta's efforts to reach its 2020 goals in Early School Leaving and Further and Higher Education.

Key lessons for Bulgaria:

- The introduction of ICT equipment into the learning process and setting up of a virtual learning environment should be accompanied by the retraining of the teachers, as well as support for the children and parents;
- ESF funding can be used to finance innovative projects, which respond to the needs of the population in emergency situations. Source: Ministry of Education and Employment of Malta Example of a tablet and teacher training videos



[54] https://www.digital.edu.mt/

The project described in Box 7 responds to the objective of ESF 2014-2020 related to skills development, labor market reorientation of education and support of gender equality through the provision of high-quality general education for girls. The workshops directly influenced the physical learning environment through the usage of various devices and materials such as tablets, computer parts and other paper-based tools (diagrams, worksheets, etc.). Indirectly the learning environments were influenced by the teaching methods the trainers used. They promoted creativity, teamwork, problem-solving, presentation skills through their instruction. They also re-arranged the physical environment differently: moved chairs, tables, classroom decoration and applied the use of games and physical activity. The project description contains no information whether additional equipment was purchase within the framework of ESF.

Box 7. Spain, 2017-2018, General Education (Primary Education)

Encouraging more girls into science and technology,

ESF contribution: € 15,466.00
Source: https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=3140

Video illustration of the learning environment:
https://www.youtube.com/watch?v=Q2fzd7qCGWU&index=1&list=PLIdOa4FWXTfT-YNKPwrVHQhdTcEH85e8k
Organizer/Beneficiary: Instituto de la mujer y para la igualad de oportunidades

The Institute for Women and for Equal Opportunities (Instituto de la mujer y para la igualad de oportunidades) has created a series of engineering and technology-related workshops and activities for children of primary school age to encourage more girls into STEM careers thus promoting gender equality.[55] This set of workshops is called ADA Programme. According to the statistics, jobs relating to digital content, including communication and media, involve a similar percentage of men and women in Spain, while the women represent only 10% of computer science and computing roles in comparison with men. In one year (2017-2018), the ADA Programme was held in 37 schools across 15 Autonomous Communities in Spain. More than 800 pupils took part and over half of them were girls. The workshops include visits from female professionals to serve as role models as they represent male-dominated sectors such as industrial engineering, computer engineering, naval engineering, piloting, and chemistry. Also, the students were invited to actual working places and able to interact with the learning environment there.

Key lessons for Bulgaria:

- Development of STEM-lessons and organization of learning environments should be implemented in cooperation with the professional association and enterprises.
- Following the needs of the boys and girls, the project might address the elements of learning environments to support gender equality

STEM-workshop in the primary school.

Source: Instituto de la mujer y para la igualad de oportunidades

[55] https://www.youtube.com/watch?v=Q2fzd7qCGWU&index=1&list=PLIdOa4FWXTfT-YNKPwrVHQhdTcEH85e8k

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The project described in Box 8 follows the objective of ESF 2014-2020 related to skills development and labor market relevance of education. The change in the physical learning environment is introduced through the upgrade of the equipment and learning materials, which is in line with the expenditure eligibility rules of ESF 2014-2020. The teacher's training might indirectly impact the usage of the existing learning environment.

Box 8. Slovakia, 2014-2015, VET

"If you can explain me something",

ESF contribution: EUR 271 010
Source: https://ec.europa.eu/esf/main.jsp?catId=46&langId=en&projectId=1522 Organizer/Beneficiary: Technical college Tlmače

The project aim is to make lessons more innovative and in line with the needs of local employers that would seek skills in mechanical engineering, cutting and welding, marketing and computer-aided design. Investing in skills and helping people into work are the main priorities of Slovakia's ESF strategy for the 2014-2020 period.
For this purpose, the technical college Tlmače in Slovakia purchased a variety of computers, software, machinery, teaching aids and book collections including a hands-on learning package to acquire relevant skills in a real job-like environment. 228 students and 21 staff members were targeted in the framework of the project.
Besides, there was a training course and professional development of the college teaching staff to prepare them for introducing the new equipment. Therefore, the learning environments were directly targeted by updating learning materials and indirectly by the staff training. According to the project organizers, this intervention would improve students' creativity and decision- making skills.

Key lessons for Bulgaria:
- Introduction of new equipment in the learning environments requires teacher retraining and coaching;
- The ESF allowed to replicate the work-like environment in the premises of VET institution. It is important to guarantee that it is welcoming and supportive for different group of students. For some students this learning environment gives a chance to get relevant skills combining with the studies in technical college.

3.3. Specific focus and limitations of ESF+ in the new funding period 2021-2027: project expectations

During 2021-2027 while the main focus of education projects will remain the same, more attention will be made on the development of digital skills and fostering social inclusion, especially of the most disadvantaged groups of the population. The new ESF+ fund will accumulate the resources of the existing European Social Fund, the Youth Employment Initiative (YEI), the Fund for Aid to the Most Deprived (FEAD), and the EU Programme for Employment and Social Innovation (EaSI). It will foster the implementation of the European Pillar of Social Rights. The new regulation exists in the format of legislative proposal, adopted by the European Commission on 30 May 2018. According to Article 4 of the proposal, the projects, which are related to the education and eligible for ESF+ should continue to improve the quality, effectiveness and labor market relevance of education and training systems, to support the acquisition of key competences and skills, promote life-long learning. A special focus in the new programming period will be made on the development of digital skills. The strong attention to the inclusion and equal opportunities, especially of disadvantaged groups will remain, but also the projects should promote socio-economic integration of third-country nationals and of marginalized communities such as the Roma. A target of 25% of ESF+ funding is set for the policy measures fostering social

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inclusion and targeting those most in need. Additionally, 4% of ESF+ funds should support the most vulnerable groups of the population.

To combat socio-economic impact of the COVID-19 in the European Union, the current ECF+ regulations proposal was revised to address child poverty, youth unemployment and stronger focus on digital skills. Due to the COVID-19 crisis, the European Commission revised the proposal for the next multi-annual financial framework for 2021-2027 and introduced several amendments to the ESF+ regulations proposal[5657]. In terms of tackling the impact of COVID-19, the EU Member States should allocate at least 5% of the ESF+ resources to activities addressing child poverty. In addition, the Member States with a rate of young people aged 15 to 29 not in employment, education or training above the EU average in 2019 on the basis of Eurostat data, should allocate at least 15% of their ESF+ resources to improve youth employment.[58] More emphasis is done on development of digital skills and supporting green economy with the relevant competences.

The new expenditure eligibility rules introduce clearer rules for the purchase of furniture, equipment and vehicles. According to Article 14, there will be two types of costs, which are not eligible under the general support of the ESF+ funding. First of all, the purchase of land and real estate, and the provision of infrastructure will be forbidden as in the previous programming period of ESF. However, the purchase of furniture, equipment and vehicles will be allowed on an exceptional basis if the purchase is necessary for achieving the objective of the operation, or these items are fully depreciated, or the purchase of these items is the most economic option.[59]

IV. Bulgaria policy mix addressing learning environments 2014-2020

Bulgaria: The policy mix addressing learning environments in the period 2014-2020 – a review of programs and approaches

To address learning environment needs and invest in contemporary educational settings, Bulgaria has implemented a variety of actions in the period 2014-2020. The mix of activities encompasses four key funding pillars, with the national budget and the EU funds being the key investment sources. In the first place, the national policy and budget ensure the maintenance of and the capital investments in direct learning environment (LE) equipment[60] by applying the state

[56] Amended proposal for a COUNCIL REGULATION laying down the multiannual financial framework for the years 2021 to 2027. COM(2020)443/F1. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1601169870488&uri=CELEX:52020PC0443

[57] Amended proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the European Social Fund Plus (ESF+) COM(2020) 447 final 2018/0206(COD). URL: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020PC0447&from=EN

[58] Amended proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the European Social Fund Plus (ESF+) COM(2020) 447 final 2018/0206(COD). URL: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020PC0447&from=EN

[59] https://eur-lex.europa.eu/resource.html?uri=cellar:a39e5630-640f-11e8-ab9c-01aa75ed71a1.0003.02/DOC_1&format=PDF

The activities in the system of pre-school and school education are financed with funds from the state budget, municipal budgets, European funds and programs, and other sources. Funds from the state budget are used to finance in full or in part the activities that are the object of state policy (Art. 280 PSEA). Educational policies are funded at the national level through delegated budgets to educational institutions. Municipalities and ministries owners of municipal and state educational institutions receive funds needed for the implementation of key educational policies and follow restrictive regulatory requirements and formulas for the distribution of funds to schools and kindergartens.

standards on infrastructure[61]. Secondly, since 2008-2010 the Ministry of Education and Science (MoES) has been gradually putting more emphasis on the implementation of annual programs, such as the National Programs for Development of Education (NPDE)[62] that address priority policy questions and educational system needs. Under the NPDE specific investments have been made in direct LE mainly in school education and vocational education and training (VET), and to a lesser extent in pre-school education. Thirdly, since 2007 Bulgaria has designed complex interventions in education financed by the EU funds. In the period 2014-2020 the EU funds were used for financing projects at system and provision level, in terms of both capital investments in the LE and investments in the direct LE. Finally, development agencies have contributed to specific aspect of the LE in pre-school education, dual VET (Bulgarian-Swiss Cooperation Program) and STEM (America for Bulgaria Foundation) focusing on programs aimed at improving the learning outcomes.

In the period 2014-2020 Bulgaria was successful in boosting the number of educational institutions, students and educational specialists who have benefitted from activities that address the LE. The NPDEs and the Operational "Program Science and Education for Smart Growth" (OPSESG) are the key instruments for investing in the direct LE. Overall, there is a significant increase in the investments through both NPDEs and EU funded programs targeting pre-school and school education in Bulgaria. The total national and EU investments account for more than BGN 556 897 675 for the period 2016–2020, out of which BGN 139 687 536 are estimated to address direct LE[63]. The increase in the number of schools/ kindergartens and students who have benefitted from the investments, as well as other relevant indicators have been presented in Table 2. For the period 2016-2020:

- the number of NPDEs has doubled (11 NPDEs in 2016; 21 NPs in 2020) and the funding has increased from BGN 50 million to BGN 136 million in 2020. In accordance with the new Pre-school and School Education Act (PSEA, 2016) the NPDEs have become the key operational instrument of MoES for encouraging educational institutions and key stakeholders, such as municipalities, to address priority areas in the field of education[64]. Learning environment investments have increased from nearly BGN 18 million in 2016 to BGN 40 million in 2020 representing respectively 34,8% (2016), to 29, 3 % (2020) of all targeted funding to educational institutions through the NPDE. In 2020 there were 10 NPDE modules[65] that covered various topics associated with the LE.
- Under the OPSESG four key investments in the educational system (system level projects[66]) that address the direct LE have been planned (presented below). The potential amount to be spent on the direct LE is BGN 55 450 000 for the period 2016-2023. Each of the four projects is aimed at a large group of educational institutions: (i) the OPSESG project „Education for tomorrow" BG05M2OP001-2.012-000 (2019-222) is aimed at 2000 beneficiary institutions,

[61] ORDINANCE № RD-02-20-3 of 21.12.2015 for design, implementation and maintenance of public service buildings in the field of education and science, healthcare, culture and arts

[62] NPDE are a leading instrument of MoES for funding key activities in pre-school and school education. The NPDEs target priority policy areas, and are predominantly planned on an annual basis, and funded through the national budget.

[63] BGN 556 897 675 is the total budget for financing the NPDEs for the period 2016-2020; the budget of OP SESG system projects, investing in educational environment for the period 2016-2020; BGN 139 687 536 is the budget of the activities under NPDEs financing the LE plus the maximum percentage of the budget of the OPSESG system projects, allowed for direct LE investment for the period 2016-2020.

[64] Overall, after more than 10 years of experience with NPs, within the last years MoES developed its practices to more systematized planning, thematic scope and implementation. Most of the NPs finance predefined thematic activities on a competitive basis where educational institutions (kindergartens, schools, centers for education support and special education stakeholders as municipalities) apply for funding and compete for funding.

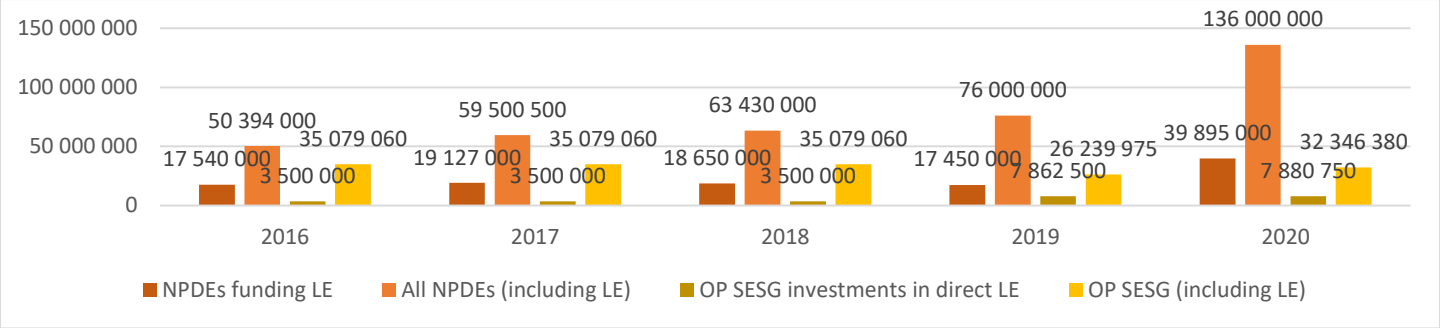
[65] A total of 6 NPDE, which include 14 modules addressed learning environment for the period 2016-2020 (see below).

[66] The projects are implemented by MoES and the educational institutions apply for funding directly to MoES according to the eligibility criteria and objectives set out in the respective project.

1960[67] of which are schools; (ii) the OPSESG system project „Support of Dual Learning System" BG05M2OP001-2.014 – 0001 is aimed at 147 schools out of 427 vocational schools; (iii) the OPSESG Project „Education for tomorrow" BG05M2OP001-2.012-000 (2019-2022) targets a total of 650 pre-school and school educational institutions (4 100 students with SEN and 7 700 students with either chronic diseases, being at risk, or having outstanding gifts); (iv) the OPSESG project Your Class – Phase 1"BG05M2OP001-2.004-0004 (2016-2018) was implemented in 1660 beneficiary schools which represent 70% of all schools;

- To address the negative impact of COVID-19, under the EU REACT[68] measures, MoES has planned to make an additional investment of BGN 15 000 000 for the establishment of STEM centers according to the model of the NP "Building STEM Environment in schools", and to use the funds under the OPSESG for purchasing 34,000 laptops for the distance learning of children at the estimated amount of BGN 25 000 000 as a continuation of the targeted policy of the NPDE "ICT in the System of Pre-school and School Education" and the project "Education for tomorrow"(2019 - 2022) under OP SESG.

NDPE and OP SESG investments in LE 2016-2020



Source: MoES's webpage[69]

The 2020 thematic scope of LE programs represents a mix of three key types of activities - general investments in the LE in schools and pre-schools, thematic modules on specific topics related to the curriculum (experimental work in natural sciences, reading, road safety, STEM in schools) and funding for purchasing of specialized equipment for the needs of VET, ICT, SEN and physical safety. The investments in equipment and the direct LE remain unchanged over time. MoES data shows that those investments are limited in scope and made on an ad-hock basis. In 2020 MoES increasingly invested in programs that link the LE to the curriculum in accordance with its efforts to promote policies focused on learning (efforts to promote competence-based learning have been made since2019[70]).

[67] The total number of schools in Bulgaria in the 2019-2020 school year is 2376.

[68] The implementation of measures under the REACT-EU mechanism consists in redistribution the ESIF contribution by transferring funds between the operational programs for the period 2014-2020 to support measures aimed at minimizing the negative consequences from the epidemic spread of COVID-19. The budget of the European Union instrument REACT-EU for Bulgaria is EUR 656 million, and schools will also be able to benefit from it. Resource transfer decisions were driven by the scope of interventions that could be funded by OPHRD and OPIC, and by the ability to have a direct impact on the most affected part of the population as a result of the spread of COVID-19.

[69] 2020 NPDEs: https://www.mon.bg/bg/100814, 2016-2020 NPDEs: https://www.mon.bg/bg/75; OP SESG system projects: https://www.mon.bg/bg/706

[70] A Roadmap to teacher policy and reforms. WB 2020

2016-2020 policy mix addressing the LE – the NPDE and the OPSESG* *Color cells indicate thematic overlapping (see the analysis below)*

Funding period 2016-2020			Annual funding for LE by module in BGN				
NPDE/OP SESG	**Module/ Activity**	**LE scope**	**2016**	**2017**	**2018**	**2019**	**2020**
1."Providing a Modern Educational Environment"	1.1. Modernization of Vocational Education	VET - repair end equipment of training classrooms for vocational training	2 000 000	1 500 000	1 500 000	1 500 000	2 170 000
	1.2. Improving the Conditions for Experimental Work in Natural Sciences	Natural Sciences - Lab equipment and repair of labs	2 400 000	2 400 000	2 000 000	2 000 000	1 500 000
	1.3. Support for Full-day Schooling in Schools	Repair and equipment of classrooms for reading, drawing, games and recreational activities	800 000	800 000	800 000	800 000	800 000
	1.4. Libraries as an Educational Environment	Reading: Repair and equipment of informal cozy reading environment: creating reading corners and purchasing new books for the school libraries	-	-	-	-	600 000
	1.5. Playgrounds for Road Safety	Road safety: Repair and equipment of playgrounds (indoors or outdoors) for learning Road safety	-	-	-	-	600 000
	1.6. Providing students with lockers	Purchasingof student lockers in primary and secondary schools (1st to 7th grade)	-	-	2 900 000	-	-
	1.7. Providing Modern Environment in the Centers for special educational support	SEN: Purchasing of specialized devices and equipment for children and students with SEN	-	-	-	1 600 000	-

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Funding period 2016-2020			Annual funding for LE by module in BGN				
NPDE/OP SESG	**Module/ Activity**	**LE scope**	**2016**	**2017**	**2018**	**2019**	**2020**
2. "Optimization of School Network"	2.1. "Rationalization of the School Network"	Preparation for school closure or transformation: repairing school buildings, improvement of the equipment in schools, creating school canteens, purchasingof school buses	1 925 000	1 797 000	-	-	-
	2.2. "Rationalization of the Vocational School Network"	Preparation for vocational school closure or transformation: repairing school buildings, upgrading the material and technical equipment; costs related to the relocation of machinery, equipment and facilities	900 000	900 000	-	-	-
3. "Creating Accessible Architecture and Security in Schools"	3.1. "Accessible architectural environment"	Planning, construction and renovation of facilities such as elevators and ramps for children with motor difficulties	500 000	750 000	700 000	700 000	400 000
	3.2. "Security"	Supplying schools with alarm systems, systems for video surveillance and systems for access control	1 500 000	750 000	750 000	550 000	300 000
4. "ICT in the System of Pre-school and School Education"	One module, different activities, different beneficiaries	ICT: Funding the implementation of modern technologies in schools and kindergartens and providing infrastructure for internet connectivity and the use of a single database.	7 500 000	10 230 000	10 000 000	11 000 000	12 000 000
5. "We Succeed Together"	Module "It's nice in the Kindergarten"	Preschools: Repairing and purchasing equipment for classrooms for conducting activities related to reading, drawing, applications and games and recreational activities	-	-	-	100 000	300 000

Funding period 2016-2020			Annual funding for LE by module in BGN				
NPDE/OP SESG	**Module/ Activity**	**LE scope**	**2016**	**2017**	**2018**	**2019**	**2020**
6. "Building STEM Environment in schools"	Big projects (up to 300 000 BGN) and small projects (up to 50 000 BGN)	STEM: Planning, repairing and purchasing equipment for modern centers for educational innovations in science, digital technology, engineering and mathematics (STEM)	-	-	-	-	20 000 000
7. "Construction, reconstruction, adjustment and upgrade of kindergartens and school buildings"	Module 1: "Nurseries and kindergartens - construction of new buildings, as well as additions, alterations and renovation works of existing ones" , reconstruction, adjustment and upgrade of kindergartens and school buildings" with a 3-year horizon of action (2020-2022).	Construction and reconstruction of buildings of nurseries and kindergartens	-	-	-	-	35 000 000
	Module 2: "State and municipal schools- construction of new buildings, as well as additions, alterations and renovation works of existing ones"	Construction and reconstruction of buildings of state and municipal schools					35 000 000
8. OPSESG Development of school students' skills and raising motivation for learning through activities developing specific knowledge, skills	BG05M2OP001-2.004-0004: All main activities are supplemented by purchase of office supplies, educational tools and equipment (2016 - 2018)	Supplying copy paper, toner cartridge, educational or specialized literature, didactic materials - teaching aids or manuals, sports equipment, equipment and furniture for the classrooms	3 666 667****[71]	3 666 667****	3 666 667****	-	-

[71] Rough estimate of the potential funding in direct LE for **Development of school students' abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1**BG05M2OP001-2.004-0004 is 7 300 000 BGN. The sums presented in the table are 1/3 of the amount, assuming that the distribution of funds during the 3-year application of the project is even.

Funding period 2016-2020			Annual funding for LE by module in BGN				
NPDE/OP SESG	**Module/ Activity**	**LE scope**	**2016**	**2017**	**2018**	**2019**	**2020**
and competences (Your Class) – Phase 1							
9. Project Education for tomorrow	BG05M2OP001-2.012-0001 Activity 2: Building a modern protected educational environment in schools and kindergartens, based on modern ICT facilities. (2019- 2022)	Implementing a cloud environment and of an unified platform for educational services and contents; Purchasing equipment for visualization such as interactive whiteboards, interactive tables for kindergartens, tablets, multimedia projectors and displays for visualization of interactive content, specialized modern equipment for students with SEN.	-	-	-	7 862 500[72]*	7 862 500*
10. Project Support of Dual Learning System	BG05M2OP001-2.014 – 0001 Activity 1: Assisting schools in introducing the dual education system; (2020 - 2023)	Purchasing of equipment and materials for the purposes of dual training.	-	-	-	-	2 433 333[73]**

[72]*Rough estimate of the potential funding in direct LE for Project "Education for tomorrow" BG05M2OP001-2.012-0001 is 31 450 000 BGN. The sums presented in the table are ¼ of the amount, assuming that the distribution of funds during the 4-year implementation of the project is even.

[73] ** Rough estimate of the potential funding in direct LE for Project "Support of Dual Learning System" BG05M2OP001-2.014 – 0001 is 7 300 000 BGN. The sum presented in the table is ¼ of the amount assuming that the distribution of funds during the 4-year implementation of the project is even.

Funding period 2016-2020			Annual funding for LE by module in BGN				
NPDE/OP SESG	**Module/ Activity**	**LE scope**	**2016**	**2017**	**2018**	**2019**	**2020**
11. Project Support for inclusive education	BG05M2OP001-3.018Activity 4: Purchase of equipment for additional support for personal development in educational institutions; (expected 2020)	Supplying new equipment and materials for educational institutions working in the field of inclusive education.	-	-	-	-	0[74] ***
12. EU REACT[75] measures	Following the model of NPDE "Building STEM Environment in schools"	Establishming STEM centers					15 000 000
	Following the model of OP SESG project Education for tomorrow"(2019 - 2022) and NPDE "ICT in the System of Pre-school and School Education"	Purchasing of equipment to provide distance learning for the children (34,000 laptops)					25 000 000

Source: MoES's webpage[76]

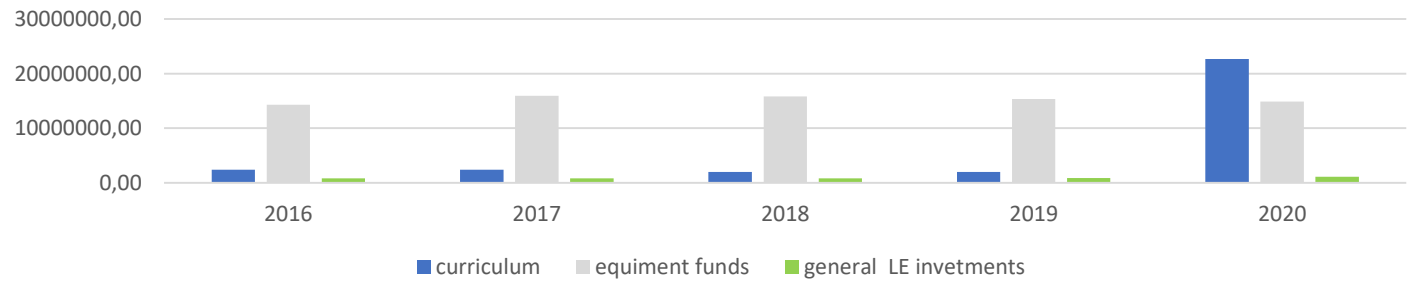
[74] *** Project Support for inclusive education BG05M2OP001-3.018 is still in preparation in 2020. Rough estimate of the potential funding in direct LE: 6 200 000 BGN

[75] The implementation of measures under the REACT-EU mechanism consists of redistribution of the ESIF contribution by transferring funds between the operational programs for the period 2014-2020 to support measures aimed at minimizing the negative consequences from the epidemic spread of COVID-19. The budget of the European Union instrument REACT-EU for Bulgaria is EUR 656 million, and schools will also be able to benefit from it. Resource transfer decisions were driven by the scope of interventions that could be funded by OPHRD and OPIC, and by the ability to have a direct impact on the most affected part of the population as a result of the spread of COVID-19.

[76] 2020 NPDEs: https://www.mon.bg/bg/100814, 2016-2020 NPDEs: https://www.mon.bg/bg/75; OP SESG system projects: https://www.mon.bg/bg/706

curriculum	Construction of Playground Safety Roads					
	Equipment for laboratories - physics, chemistry, biology					
	Libraries					
	STEM: Building STEM environment in schools					
equiment funds	SEN special equipment					
	Accessibility: Accessible architectural environment; improving the system of security and safety in schools					
	ICT: ICT equipment (computers, laptops, multimedia, interactive boards, etc.), software and internet connectivity					
	Network for provision: Adapting school environment to restructure the school network					
	VET: Repairs and equipment of classrooms for VET in vocational high schools					
general LE invetments	Modernization of the general learning environment; renovation and equipment to ensure all-day organization of the school day in schools,					
		2016	2017	2018	2019	2020

Thematic and financial scope of the NPDEs addressing the LE 2016-2020 (a quick review)



There is an overlap of the thematic scope and the targets in the 2020 NPDE mix which allows for a better conceptual design and distribution of funds. The conceptual coordination between the separate modules could be interpreted as a strong message on the system level with respect to policy priorities and could promote the focus on key educational targets such as competence- based learning and student-oriented learning and teaching. Overlaps have been identified in the scope of the following thematic programs that address the LE in the NPDE policy mix for 2019 and 2020:

- **2020: the Natural Sciences Program vs. the STEM Program[77]:** in 2020, both programs provided funding for the improvement of the learning environments for natural sciences. The duplication of funding opportunities led to the use of double standards: the schools which choose to apply under the NPDE "Providing a Modern Educational

[77] NPDE "Providing a Modern Educational Environment", Module „Improving the Conditions for Experimental Work in Natural Sciences" and NPDE "Building STEM Environment in schools".

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Environment" had to submit only technical and administrative documents, while the applicants under the NPDE "Building STEM Environment in schools" had to present a holistic concept and to participate in a two-stage procedure aimed at developing a comprehensive vision for upgrading teaching and learning as a consequence of renovating the LE. As a result, MoES encouraged some of the schools to develop a holistic approach to the LE and coordinate it with the respective changes to the educational practices, the curriculum and school management, while the other schools received funding only for changing the LE, without being required to adopt a comprehensive approach to learning. The eligibility requirements for Module 2 of the NPDE "Providing a Modern Educational Environment" were limited only to specialized high schools or secondary schools delivering specialized training in science subjects[78]. The schools which had to meet additional requirements related to (i) the availability of teachers with experience (without specifying the scope of this requirement) in teaching the respective subjects and (ii) existing partnerships with universities and colleges in developing curricula for elective modules in science, had the opportunity to apply for funding of up to ***BGN 53,000*** for renovation of classrooms including reconstruction and construction, purchasing specialized furniture and equipment, and purchasing ICT equipment. The application procedure was simplified and included the completion of an application form (in which general information and reasoning should be provided), a decision of the pedagogical council as well as administrative and technical documents. Under the NPDE "Building STEM Environment in Schools", schools with a broader profile (all state and municipal schools) had the opportunity to apply for funding of up to ***BGN 100,000*** (for schools with more than 300 students) and of up to ***BGN 50,000*** (for schools with less than 300 students) for renovation of classrooms including reconstruction and construction, purchasing of furniture and equipment which, according to the school plan and proposal, may include the same elements as the equipment under Module 2 of the NP "Providing a Modern Educational Environment". The application process for receiving funding for the creation of a STEM center was much more complicated and required the development of a comprehensive concept linking the renewal of the learning environment to changes in teaching practices, the curriculum and school organization and management.

- **2019: Accessible architecture under two NPDEs[79].** Both programs addressed different needs of children with motor difficulties, instead of addressing those needs by means of a comprehensive program providing full access to educational facilities and equipment for children who belong to this group. While the NPDE „Creating Accessible Architecture and Security in Schools" invested in activities helping students with motor difficulties to access school rooms and bathrooms, the NPDE "Providing a Modern Educational Environment" invested in the purchasing of specialized equipment for children and students with SEN thus making it possible for training activities, therapeutic and rehabilitation work to be carried out in specialized rooms. Although targeted at different institutions, the above investments served the needs of the same group of children and could be implemented holistically thus providing children with disabilities in the educational institutions with access to education. In practice, the NPDEs provided only part of the educational environment that was needed for ensuring the educational process of children with motor difficulties in the educational institutions. The centers for work with children with SEN received funding for purchasing equipment of specialized rooms but did not have the opportunity to renovate their toilets and premises and make them accessible to these children. At the same time, there were schools which could provide physical access to buildings and renovate their toilets but could not provide the equipment required for supporting children with motor difficulties. The adoption of a unified approach guaranteeing the capacity of educational institutions to fully ensure

[78] Science subjects listed in NO: 1) Physics and astronomy; 2) Chemistry and environmental protection; 3) Biology and health education

[79] NPDE "Creating Accessible Architecture and Security in Schools", Module "Accessible architectural environment and NPDE "Providing a Modern Educational Environment", Module "Providing Modern Environment in the Centers for special educational support

the renovation and equipment of the LE would have saved much of the burden on the MoES administration and would have ensured the full coverage of the needs of children with disabilities.

- **2020: Reading corners and books in schools vs. Renovation and equipment of rooms for whole day schooling which could include reading corners and books[80].** Both modules provide for improving the LE in schools (the total amount of funding for each module being BGN 600 000). The overall concept does not make use of needs assessment arguments in favor of the design of two different modules that address the same essential element of the LE, instead of designing a single concept for general LE investments in schools. The MoES data for 2020 do not allow for assessing the needs and the coverage of those activities.

The majority of NDPEs programs that address the LE are fragmented and focus on individual activities or specific pieces of equipment, without taking into account their targeted contribution to the educational goals, the learning process or the cumulative effect of the investments under the different NPDEs that address educational policy goals. In 2020 many of the NPDE modules addressing the LE were designed as separate practices, and not as an input contributing to the improvement of the results of the educational system (curricula, pedagogical practices, learner-oriented management of the educational institution). As a result of this fragmented approach to funding, most of the investments failed to to contribute to improving the overall experience of children and students in the educational system, and respectively, failed to use the educational environment as one of the factors that has an impact on the development of pedagogical practices and the improvement of the results of pre-school and school education. The fragmented approach has been embedded in the design and management of the NPDEs that provide funding and separately manage programs/funding: (i) modernization of pedagogical practices (NP "Qualification of pedagogical specialists "2016-2020); (ii) implementation of specific activities with students (NP "Without free time in school" 2016-2020); (iii) investments in the LE (NP "Providing a Modern Educational Environment"(2016-2020) and NP "ICT in the System of Pre-school and School Education" 2016-2020). As a consequence, the LE has not been used as a factor contributing to the improvement of the quality of education in schools and pre-schools. On the contrary, the majority of the modules provide funding on the basis of a stand-alone, independent application aimed at meeting administrative and technical criteria. The educational institutions which have managed to meet the requirements of the respective program and have the administrative capacity to implement it, receive funding to renew the respective elements of the LE without being required to bring about any other changes in the educational institution.[81]

Some NPDE modules have started to make use of more complex approaches (following the approach and requirements used under the ESF programming[82]) but the scope of activities they offer is still limited as is the access of beneficiaries to synergic investment effects:

- *NPDE "Providing a Modern Educational Environment" (2016-2020), Module „Modernization of Vocational Education".* Since 2018, the Program has provided financing not only for repairing and renovating classrooms for vocational training, but also for updating the curriculum for vocational training and writing new textbooks for vocational training. Nevertheless, there is no connection between updating the curriculum and renewing the

[80] NPDE "Providing a Modern Educational Environment" Module „Libraries as an Educational Environment" versus and Module „Support for Full-day Schooling in Schools"

[81] For example: - NPDE "Creating Accessible Architecture and Security in Schools" (2016-2020) the application process is based on a form in which mostly statistical and administrative data are filled in.; - Module „Providing students lockers" (2018); Module „Playgrounds for the road safety" (2020), Module „Providing Modern Environment in the Centers for special educational support" (2019) under NP Providing a modern educational Environment". - purely administrative data is requested in the application process.

[82] See the next finding.

learning environment. In the module these activities have been listed separately and the beneficiary schools have to apply for them independently which means that they can receive funding for the renewal of the learning environment while the teaching practices in the school remain the same. A link should be introduced between providing funding for the modernization of the learning environment and providing funding for the introduction of new teaching approaches and methods, including the modernization of the curriculum.

- *NPDE "Providing a Modern Educational Environment" (2020), Module „Libraries as an Educational Environment".* The procedure for applying for funding requires a description of: 1) the book titles and their relevance to the interests of students and 2) the program and the topics of the events that will be held in the reading area. This information is not sufficient to guarantee that by purchasing books, will lead to changing the pedagogical practices or that the purchased books will be used in a different or innovative way. It is possible for schools to fill theschool libraries with books that are studied as part of the curriculum and that in no way support the integration of new pedagogical practices. A better connection should be ensured between the investments in the LE and the pedagogical practices used in the respective educational institutions.

- *NPDE "Providing a Modern Educational Environment", Module Support for All-day Schooling in Schools (2020).* The application documents should be accompanied by a description of how the renovated room will be used by different groups of students and what type of activities will be held in it. The scores for innovation and new pedagogical methods would bring a total of 30 points (out of 100), if new and original pedagogical methods are used in delivering the afternoon classes in the renovated classrooms . Due to a lack of clear definition in the NPDE guidelines of what exactly is meant by "innovative" use of the educational space, there is no guarantee that the applicants will actually introduce any innovation to their pedagogical practices[83].

NPDE "We Succeed Together" (2020) addresses pre-schools (by means of three modules) where module one funding is provided for repairing and equipping classrooms for conducting activities related to reading, drawing, games and recreational activities[84]. Despite the attempts to establish a link between investments in the educational environment and the overall improvement of the educational practices, the NP "We Succeed Together" makes use of separate application procedures, assesses independently the applications submitted under each of the modules, and fails to fully integrate the investments in the LE with the investments in the other elements aimed at improving the educational outcomes of students and achieving the goals of the system. The overall focus of the program is on the transition between family and pre-school.

NDPE STEM (2020) is the key program that proposes a new approach to the NPDEE and is directly linked to teaching and learning. Influenced by the model piloted in Bulgaria by America for Bulgaria Foundation, the program aims at establishing STEM centers and introducing a new approach to LE investments. This is the only national program that establishes a link between the investments in the learning environment and other activities aimed at introducing changes in teaching practices and, accordingly, in students' performance. In addition to construction and repair works, and the purchasing of equipment for school spaces, the project proposes other key activities which contribute to completely changing the concept of learning: 1) a vision for the curriculum; 2) a vision for implementing innovative teaching methods; 3) a vision for the proper organization and management of the learning process. All these concepts need to be described by the

[83] See the paragraph concerning innovations

[84] The rest of the modules are aimed at introducing good practices and innovations in teachers' approach focused on support for the implementation and promotion of good pedagogical practices in kindergartens and joint activities of educational institutions to improve the quality of pre-school and, where applicable, school education.

applying schools in advance as part of the process of selecting the beneficiary schools. An example from the Application guide reads: "When the project idea includes a repair activity, it should be aimed at creating a new learning environment that serves a modern philosophy of teaching, learning and school management. Important for the success of the project will be the creation of learning opportunities through experiential learning, as well as the provision of structures for professional learning and development of teachers aimed at improved student outcomes and achievements." Such an approach encourage schools to arrive at a clear, comprehensive, holistic vision of the use of the renovated space. Additionally, the competitive principle creates conditions for the best visions to get more points and receive funding. **This holistic approach, which has to do not only with selecting and funding improvements of the physical space but also with motivating applicants to arrive at a comprehensive vision of the use of this space in a modern, innovative way, should be encouraged and used across programs and LE investments.**

Recommendations:

MoES could improve the design and management of actions that address closely related topics and target common outcomes by applying a coordinated approach which allows for the use of common standards and a simplified and unified administrative process. Such an approach will reduce administrative burden, strengthen the efficiency and policy impact of the NDPE, and put emphasis on the policy priorities communicated to schools through the funding stimuli.

MoES needs to refocus its policy program design and put learning and learning experience at the center of programming and planning. Stronger integration of the different activities under each of the programs is needed, so that they can fully achieve the program objectives and transform the physical environment while at the same time encouraging teamwork, practical experiments, interactive learning and the use of modern technological resources in education. The investment policy should make use of a holistic approach, which integrates the investments in the learning environment while at the same time improving pedagogical approaches, learning content and school leadership potential.

The educational system needs access to funding for basic equipment or renovations. MoES should create a special multiannual equipment fund to allow quick access to equipment investments based on school needs. The fund can replace the existing list of specific equipment programs and unify their management which should be based on regular equipment assessment needs and planning.

Learning environment status: MoES would benefit from developing a model for access to the funds provided under the NPDEs, the OPSESG and other funding sources on the basis of the individual LE status of educational institutions. The access to funds could be improved by introducing universal criteria that apply to all educational institutions, taking into account the specificities of the LE status of applicants. Such an approach could improve the coherence between LE investments and could serve as a good platform for promoting more complex concepts with respect to LE policy needs and priority topics, such as learning, innovation, creativity, etc.

The OPSESG projects that address the LE contribute to priority policy areas, without upgrading the thematic scope or introducing new thematic areas, and are the primary instruments for integrating direct learning environment

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investments as well as curricula and policies focused on learning. Following the framework of the ESF funded OPSESG[85], investments were made in the direct LE as a component contributing to human development needs and objectives. Thematically these investments broaden the scope of NPDEs actions. Learning environments are eligible for funding after meeting clear financial requirements[86] as they have an essential contribution to the achievement of program goals. Investments in the LE have been covered under two priority axes (PA) in the period 2014-20, namely PA 2-Education and lifelong learning and PA 3-Educational environment for active social inclusion. Three out of the four OPSESG system projects investing in the LE provide opportunities for renewing the LE in accordance with the new learning content. The ICT focused project provides funding for equipment and could be perceived as a technical continuation of the NPDE project „ICT in the system of school and pre-school education".

1. OPSESG Project Your Class [87] is a good example of supporting schools in providing additional classes for students who lag behind in acquiring the material in Bulgarian language or Mathematics (for schools with lower scores in the external evaluation) and of organizing extracurricular activities in sports, the arts and encouraging creativity (for schools with higher scores in the external evaluation). In practice all these activities support the implementation of the state educational standards introduced by the PSEA (2016) on investing in the LE by supplying schools with stationery and equipment for the implementation of specific educational activities (copy paper, toner cartridge, educational or specialized literature, didactic materials - teaching aids or manuals, sports equipment, classroom furniture). The budget for purchasing of materials that support the implementation of the OPSESG project activities is not big but given the duration of the project and its wide scope (over 320 000 students[88]) the amount invested in materials that support project activities is nearly BGN 10,500,000, if the beneficiaries adhere to the maximum of 10%,.

2. The OPSESG Project BG05M2OP001-2.014 – 0001 "Support of Dual Learning System" (2020-2023) contributes to the development of VET based on a curriculum that introduces dual education. This funding adds to the investments from the NPDE „Providing a modern educational environment", Module „Modernization of Vocational education" by funding VET equipment for schools that apply the dual VET curriculum. The PSEA introduced the concept of dual learning in the system of VET and the OPSESG is one of the tools through which vocational high schools have been encouraged to introduce dual learning. This is not the case with the NPDE where the funding provided to VET schools is not conditioned by the requirement for the schools to have adopted the dual learning system. Beyond that, the OPSESG project does not build on a qualitatively new approach to support vocational training and, in practice, creates additional conditions for funding vocational schools in order to improve the VET curriculum by investing in activities which are either directly aimed at changing the curriculum or are related to the implementation of the VET curriculum such as: 1) Providing financial support to students in the first high school stage in a dual education; 2) training mentors in business entities to develop pedagogical and methodological skills in order to work with students during their internships, etc.

3. The OPSESG Project „Support for inclusive education" BG05M2OP001-3.018 (pending approval in 2020) is aimed at investing in the LE, again by supporting curriculum with a focus on inclusion of children with SEN. The project includes both activities ensuring the purchasing of equipment for additional support of personal development and activities

The OPSESG addresses the National Development Program, the National Reform Program and the educational objectives in Europe 2020 Strategy. The operational program is focused on two main objectives[85]: to strengthen research and innovation, and to improve education and social inclusion at all levels of education.

[86] See Chapter III. ESF investment trends in learning environments and lessons of 2007-2013 and 2014-2020, module 3.1. European Union policy priorities in skills development and competency-based learning

[87] Project „Development of school students' abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1"BG05M2OP001-2.004-0004 (2016-2018)

[88] According to the information published on the project website http://tvoiatchas.mon.bg/About.aspx

supporting pedagogical specialists in the development of tools and didactic materials, as well as the development of curricula for children with SEN. This is a new approach to investments in Bulgaria, as the financing of the same activities related to the LE of children with SEN under the NPDEs is aimed only at repairing, equipping and providing materials, without directly linking these activities to the development of curriculum items. The project finances the development of the curriculum and the creation of conditions for work with children with SEN in a large number of educational institutions, covering a total of 650 kindergartens and schools and 11 800 children with chronic diseases/ outstanding gifts.

4. The OPSESG Project „Education for tomorrow“ BG05M2OP001-2.012-000 (2019-2022) provides funding for ICT equipment and pursues the goals of several NPDEs[89] related to financing additional opportunities for the implementation of a cloud environment and a unified platform for educational services and content, as well as provision of equipment for visualization of the study material (interactive whiteboards, interactive tables for kindergartens, tablets, multimedia projectors and displays for visualization of interactive content, specialized modern equipment for students with SEN).

The OPSESG approach to promoting an integrated programming for the LE and identifying learning needs to guarantee the achievement of project objectives. The activities implemented in the period 2014 - 2020 demonstrated the efforts made for addressing key goals in the educational system by introducing various activities that cover all elements of the LE (pedagogical approaches, educational content, teacher skills; renewed physical environment). The goals set in all OPSESG projects refer to achieving the key goals for the system: improving the quality of education, improving the students' educational outcomes , reducing the share of school dropouts. Despite the ambition for adopting a holistic approach to public investment resources from the OPSESG, the projects have been planned as separate, independent activities aimed at achieving specific goals with respect to different stakeholders and beneficiaries.

The activities under the OPSESG Project „Education for tomorrow" BG05M2OP001-2.012-000 (2019-2022) cover the full range of interventions required for meeting the policy targets and improving not only the learning environment, but also the learning process and students' learning outcomes. The project provides funding not only for the replacement and upgrading of ICT equipment, but also for delivering teacher training, as well as conducting extracurricular activities with students on the proper use the ICT equipment. Despite the intention for adopting a comprehensive approach, the implementation of the activities happens independently. This, together with the lack of requirements for linking the various activities with each other, increases the risk of fragmented planning, implementation and reporting of activities, which leads to a lack of potential cumulative effect. For example, the project does not provide for a direct link between Activity 2 (providing ICT hardware and software), Activity 3 (teacher training) and Activity 6 (organizing extracurricular activities with students to develop their digital skills). In practice, these activities, instead of complementing, upgrading and leading to an integrated educational goal, are considered as separate elements, for the implementation of which different teams are responsible: (i) the choice of ICT equipment (Activity 2) is made by the principal of the educational institution; (ii) the choice of topics, goals, format of trainings and training organizations for PD of the teachers (Activity 3) takes place at regional level; (iii) the level of digital literacy, the needs of the students and the goals of the extracurricular activities are determined by the teachers who work with the students (Activity 6).

[89] NPDE "Providing a Modern Educational Environment" (2016-2020); NPDE" ICT in the System of Pre-school and School Education" (2016-2020)

Recommendation: The integration of investment in the LE with activities that support the implementation of the curriculum should be encouraged, along with the efforts to support key system goals and improve teaching practices and student results. MoES needs to focus its efforts on coherent programming and implementation in order to replace the fragmented activities by proactive management and integrated results.

The programs and projects financed both through the OPSESG and the NPDEs are focused on indicators that measure human resource and institutional inputs rather than policy outcomes. The links between the investments made and the key objectives for the system set out in the government's educational framework are quite formal, with administrative and financial indicators being examined at the project level rather than the achievement of system specific objectives. In addition, the lack of integrated impact monitoring or assessment, which would objectively monitor the interdependencies between the invested resources and the results achieved within the system limts the management and policy approach. The monitoring and reporting of formal criteria with a focus on administrative reporting strengthens the financial and administrative management of projects and develops a specific capacity of MoES but does not support assessment and the identification of the strengths and weaknesses of the existing approach to funding. In order to optimize the results of the investments, the connection between the investments and the achieved results should be traced, and the analysis should be used to inform future decisions with respect to the structure, organization and implementation of funding mechanisms in different areas.

The NPDEs are aimed at achieving the global goals set out in the strategic documents[90] by explicating the link between each program and the achievement of the respective goal. The NP "Providing a Modern Educational Environment" (2016-2020) has been designed to contribute to "providing conditions for equal access to pre-school and school education and improving the quality of the educational process". The NPDEs formulate a number of indicators most of which are quantitative such as number of schools, number of pedagogical specialists, number of equipment tools, etc. which does not allow for measuring the impact of investments and their contribution to achieving the respective goal. The monitoring of program implementation strictly follows the financial and administrative parameters of the set indicators, limiting the measurement to quantitative criteria only.

This observation is valid for all NPDEs and as well as for the OPSESG projects which also make use of quantitative indicators mainly. The Project „Education for tomorrow" BG05M2OP001-2.012-0001 (2019 - 2022) has included the share of schools that have introduced innovative teaching methods as an outcome indicator but it does not provide a definition of innovative teaching, which means that if there is will on the part of the different educational institutions, this indicator cannot be measured in the same way by all of them. The monitoring plan does not provide for direct monitoring of teachers' work, which is why such an indicator cannot be measured at regional or national level. Similarly, it has not been envisaged to measure the level of teachers' acquired knowledge and skills (Activity 3). As a result, the actual reporting can be done only on the basis of the quantitative criteria of number of enrolled and number of trained teachers. With regard to students, however, not even an attempt has been made to set a qualitative indicator and only a quantitative criterion has been introduced: the share of students who have successfully completed their participation in interest clubs.

[90] Strategy for reducing the share of early school leavers (2013 - 2020); National strategy for lifelong learning for the period 2014-2020; National strategy for development of pedagogical staff; The Strategy for Development of Vocational Education and Training in the Republic of Bulgaria for the period 2015-2020; National Strategy for Promoting and Improving Literacy (2014 - 2020); Strategy for effective application of information and communication technologies in education and science of the Republic of Bulgaria (2014-2020); Strategy for educational integration of children and students from ethnic minorities (2015 - 2020)

Recommendations: In the planning of investment projects, adequate, realistic and measurable goals should be set. These goals should be pursued not only in view of meeting the requirements of administrative reporting, but also in view of informing future decision-making and taking actions to adapt and change investments so that they can help in achieving the set goals and reflect the dynamic changes in society and economy. The setting of quality indicators for each program is a key element of the process of tracking the results of investments, and as such, should be supported by reporting the activities and invested resources that have led to qualitative changes and results (outcomes and outputs).

MoES should introduce an ongoing impact monitoring based on key system and policy goal-oriented elements across funding instruments. Such an approach would help both the operational management and assessment of the functioning of investment mechanisms and invested resources. The data from previous assessments, although limited in scope („Schools of the future" and Plovdiv's „Montessori program"), could serve as reference instruments and data sets. Future decisions on the structuring of programs and the optimization of the funding processes should be focused and based on knowledge and ongoing data set maintenance.

The overall investments in the LE for the period 2014-2020 have not addressed the innovation policy goals and have not encouraged the process of finding non-standard solutions to the problems that the system faces. The investments in the educational environment are still not perceived as a factor that contributes to the introduction of innovative approaches in education. The term "innovation" has often been used by educational specialists as a synonym for "high-tech" , disregarding its meaning associated with the application of new, non-standard approaches to solving challenges in the educational system. The understanding of the term "innovative" has influenced the implementation of innovative practices in schools. In the case of LE investments, which are predominantly focused on the purchasing of specific equipment, the perception of "innovation" is limited. This limited perception has affected the way in which innovation is seen under the NPDE "Building STEM Environment in schools" (2020) where funding is directed to activities that aim at the introduction of innovative practices without clarification of what practices are considered innovative. The NPDE "Innovation in Action" is aimed at supporting schools to exchange experience and information through visits and participation in forums. Overall, the NPDE that invest in LE development have not provided any link between investments and the stimuli for innovative practices - all modules under the NPDE „Providing a Modern Educational Environment (2016-2020) and the NPDE "Creating Accessible Architecture and Security in Schools" (2016-2020) or the NPDE "Optimization of school network" (2016-2017), provide funding which is not linked to innovation or learning-oriented goals.

- Module "It's nice in the Kindergarten" of NPDE "We Succeed Together", (2020) refers to innovations as programmed by another program module „Innovative kindergartens" (under the same NPDE), which finances activities aimed at the exchange of pedagogical practices and the design of innovative programs for work with children. The implementation of the innovation activities under the two modules is independent, and there is no guarantee that the kindergartens that receive funding under one of the modules will also receive funding under the other. This clear distinction between innovation and LE funding is indicative of MoES's limited vision of and efforts toward improving the learning environment as one of the factors that contribute to innovation.

- The NPDE „ICT in the System of Pre-school and School Education" (2016-2020) refers to "innovation" by pointing out that the ICT investments are aimed at supporting schools to develop ICT-based innovations. The program, however, does not require the applicants to present their innovative ideas as part of the application procedure, nor does it examine the extent to which ICT investments have supported the development of innovative practices. The organization of funding under the program shows that the word innovation has been used without any reference to evidence of innovation based on the received ICT equipment.

In the OPSESG innovation has been addressed by two of the LE focused projects: (i) the OPSESG Project Your Class[91] creates conditions for but does not guarantee the application of new, non-standard or innovative practices with students. In applying for funding, the schools have to submit a weekly schedule of activities, which may not necessarily introduce innovative practices in working with students. Both the completion of the application forms and their review by the respective Regional Departments of Education (RDE) is a formal procedure, and the ranking of schools does not depend on the quality of the program they propose. Therefore, the link between funding and innovation is only formal; (ii) the OPSESG Project „Education for tomorrow" BG05M2OP001-2.012-000 (2019-2022) is the only project that provides funding for activities aimed at increasing the level of innovation in schools. The financing of ICT equipment has been seen as a step towards the introduction of innovations and one of the indicators under the project is related to "the share of schools and kindergartens involved in OP activities (procedure) that have introduced innovative teaching methods developed under the OP, through the use of modern ICT". Furthermore, the activity aimed at teacher training has also been seen as contributing to the introduction of innovative educational practices, as the training is supposed to be in „applying innovative teaching methods through the use of modern ICT". Despite its ambition to contribute to the development of innovative practices, the project does not provide a definition of "innovation" thus creating doubts with respect to the way in which the schools that have to report on the applied methods have understood and measured this indicator.

Recommendation: In addition to the objectives aimed at the introduction of innovative practices, it is necessary: (i) to clearly define the concept of innovation by taking into account all environmental factors that influence the process of creating innovation, including the renewal of the direct educational environment; (ii) to include monitoring indicators with respect to the innovations introduced as a result of the investments in the direct educational environment.

The specific funding of SEN policy targets is limited with respect to the access to funds for integration of children and students with SEN into the educational system. The investments in measures supporting the integration of children with SEN in the education system has increased significantly over the recent years. The implementation of special modules and programs aimed at adapting the educational environment so that it can support the integration of children with SEN is indicative of the high priority that has been given to this issue in the system. A limited number of institutions have had access to this type of funding, as pre-schools and schools that are part of the system of general education have access only to the funding provided through the OPSESG. The access to the other two funding sources is limited only to the Centers for Personal Development Support or the specialized and non-specialized state schools. These arrangements put at risk the integration of students with SEN in the general educational system as they do not allow for targeted funding of kindergartens and schools which comprise the majority of educational institutions in the system of general education. Under the NDPE "Creating Accessible Architecture and Security in Schools", Module "Accessible architectural Environment" only **state schools** are eligible for receiving funding for constructing ramps and elevators . The funding for the purchasing of didactic materials and specialized equipment for working with children under NPDE "Providing a Modern Educational Environment", Module "Providing Modern Environment in the Centers for special educational support" (2019) is directed only to the Centers for special educational support, with schools and kindergartens being excluded from the list of eligible institutions. The investments aimed at creating conditions for the integration of children with SEN in pre-schools were considered for the first time in 2020 with the development of the project „Support for inclusive education" BG05M2OP001-3.018 (2020-2023). The efforts in this direction need to be continued by creating sufficient resources (both financial resource, and opportunities and approaches) to implement the policy of integration of children with SEN in all

[91] Project „Development of school students' abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1"BG05M2OP001-2.004-0004 (2016-2018)

types of educational facilities, including kindergartens and schools. Since 2016 the funds for supporting the LE for children with SEN have been directed to:

- purchasing of specialized devices and equipment, including tools and software products, didactic materials, consumables, etc. used in the training activities, therapeutic and rehabilitation work with children and students with SEN through the NP "Providing a Modern Educational Environment", Module "Providing Modern Environment in the Centers for special educational support" in 2019;

- introducing activities for planning, construction and renovation of facilities such as elevators and ramps for children with motor difficulties through the NP "Creating Accessible Architecture and Security in Schools", Module "Accessible Architecture in Schools (2016 - 2020) , reserved to state schools;

- purchasing of equipment for additional support of personal development in educational institutions and design of specialized didactic materials (textbooks, adapted textbooks, etc.) for working with children and students through the OPSESG system project "Support for inclusive education" (2020 - 2023), BG05M2OP001-3.018

Recommendation: The investments aimed at improving the learning environment and making the the infrastructure of the educational institutions accessible to children with SEN should be made by making it possible for a larger group of educational institutions to apply for funding under the NPDEs. Investments need to be informed by an analysis of the access to equipment on the basis of the equity of access to education and learning.

Thematic scope of funding directed to the LE and key project indicators: NPDE and OPSESG projects (2016-2020)

policy area	Topic and funding	maximum for 1 applicant	Funding for 2020 in BGN	type of procedure	Indicators: Educational institutions		Indicators: children/students		Other Indicators	
					2016	2020	2016	2020	2016	2020
curriculum	NPDE Natural Sciences: Lab equipment and reparation for labs	53000BGN no data	1,500,000	Both	1750 schools	no data	62000	no data	-	-
	NPDE Reading: Repair and equipment of informal cozy reading environment: reading corners and purchase of new books for school libraries & book supply	2500BGN (corners) 1500BGN (books)	600,000	Competitive	-	100 schools	-	-	-	-
	NPDE Road safety: Repair and equipment of playgrounds (indoors or outdoors) for learning Road safety	KGs: 2500BGN Schools:3500BGN	600,000	competitive	-	60 KGs 128 schools	-	-	-	-
	NPDE STEM: Planning, repair and equipment of modern centers for educational innovations in science, digital technology, engineering and mathematics (STEM)	20 000 000 BGN	20,000,000	competitive	-	150 schools	-	-	-	-
	OPSESG VET dual training: Purchase of equipment and materials for the purposes of dual training; (2020 - 2023) Project Support of Dual Learning System BG05M2OP001-2.014 – 0001	no information	2 433 333[92]**	non competitive	-	147 schools	-	9 800 students	-	-

[92] (**Rough estimate of the potential funding in direct LE: 7 300 000 BGN. This sum is divided in 4 - the number of years for project application)

policy area	Topic and funding	maximum for 1 applicant	Funding for 2020 in BGN	type of procedure	Indicators: Educational institutions		Indicators: children/students		Other Indicators	
					2016	2020	2016	2020	2016	2020
	OPSESG SEN: Supply with new equipment and materials for educational institutions working in the field of inclusive education. (expected in 2020) Project Support for inclusive education BG05M2OP001-3.018	no information	N/A[93]***	no information	-	KGs: 220 Schools: 430	-	See note[94]	-	Ped. specialists: 4850
equipment funds	NPDE VET:- repair end equipment of training classrooms for vocational training	80 000 BGN	2,170,000	competitive	25 schools	35 schools	no data	no data	no data	no data
	NPDE SEN: Planning, construction and renovation of facilities such as elevators and ramps for children with motor difficulties	See note[95]	400,000	competitive	-	-	-	-	See note[96]	See note[97]

[93] (***in 2020 the project is still in preparation. Rough estimate of the potential funding in direct LE: 6 200 000 BGN
[94] 4 100 - chronic diseases, 7 700 -outstanding gifts:
[95] Ramps - 20 000 BGN; Toilets - 13 000 BGN; Rel. facilities - 12 000 BGN; Elevators - 105 000 BGN; Lifting platforms - 20 000 BGN; Rute marking - 2 000 BGN
[96] Total: 43 (Ramps - 4 + 7; Toilets – 9; Related facilities – 7; Elevators – 1; Lifting platforms – 5; Rute marking – 10)
[97] Total: 24 - number of performed construction and installation works – 20; - number of delivered and installed equipment - 4

policy area	Topic and funding	maximum for 1 applicant	Funding for 2020 in BGN	type of procedure	Indicators: Educational institutions		Indicators: children/students		Other Indicators	
					2016	2020	2016	2020	2016	2020
	NPDE security: Supplying schools with alarm systems, systems for video surveillance and systems for access control	See note[98]	300,000	competitive	-	-	-	-	See note[99]	See note[100]
	NPDE ICT: Funding the implementation of modern technologies in schools and kindergartens and the provision of infrastructure for internet connectivity and use of a single database.	12 000 000 BGN	12,000,000	both	30 % of KGs 200 schools	See note[101]	-	-	Regional data centers: **6**	MoES data center:
equipment funds	OPSESG ICT: Implementation of cloud environment and a unified platform for educational services and contents; Building a modern and safe educational environment in schools and kindergartens, based on the presentation (visualization) of learning material through ICT; (2019- 2022) Project Education for tomorrow BG05M2OP001-2.012-0001	no information	7 862 500[102]*	non competitive	-	1 940 schools and 60 KGs	-	-	-	-
General LE	Repair and equipment of classrooms for reading, drawing, games and recreational activities	10 000 BGN	800,000	competitive	70 schools	80 schools	1750 students	2000 students	-	-

[98] Alarm sys 3500BGN; Outsourced Video Surveillance:10000 BGN; Access control - 14 000 BGN

[99] - Holistic approach **– 35;** - Access control **-14;** - Alarm system – 1**4;** - Outsourced Video Surveillance - 16

[100] - Alarm system- **10;** - Video Surveillance- **10;** - Access control-**10**

[101] - 100 KGs; 150 schools with computer equipment; 200 schools WiFi network

[102] (*Rough estimate of the potential funding in direct LE: 31 450 000 BGN. This sum is divided in 4 - the number of years for project implementation)

policy area	Topic and funding	maximum for 1 applicant	Funding for 2020 in BGN	type of procedure	Indicators: Educational institutions		Indicators: children/students		Other Indicators	
					2016	2020	2016	2020	2016	2020
	NPDE Preschools: Repair and equipment of classrooms for conducting activities related to reading, drawing, application and games and recreational activities. Indicators are set on project level, not on module level.	2000 BGN	300,000	competitive	-	200 KGs (NP)	-	2500 children (NP)	-	200 teachers (NP)

No comprehensive planning exists with respect to the stage and the pace at which the essential or specialized equipment should be replaced or updated throughout the system. Neither MoES, nor any other public body carries out regular reviews or collects information with respect to the equipment used in the educational system or to the regular needs, including the need for ICT. The analysis did not find evidence for systematic planning in terms of the direct learning environment. Using the EU REACT funds for purchasing of ICT equipment is a good example of the ad-hoc attempts to provide ICT equipment to the educational institutions as it shows that the system does not have a sufficient number of devices, and that the NPDEs and the OPSESG projects implemented so far are not sufficient to cover the need for ICT devices for teachers and students. The NP "ICT in the System of Pre-school and School Education" is one of the sustainable programs with a gradual increase of the investments from BGN 7,500,000 in 2016 to BGN 12,000,000 in 2020. The intention of MoES is also to provide funding under REACT-EU mechanism for purchasing of equipment for the distance learning of children by purchasing 34,000 laptops to an estimated amount of BGN 25 000 000. The ICT policy does not differ from the government's approach to funding specific goals without putting them in a broader context. The NPDE finances the purchasing of ICT tools and ensures their integration through the provision of Internet connectivity, access to databases, and training of teachers to use the respective technologies. The programs do not refer to a global goal, such as the introduction of ICT in the educational process through a change in educational content and pedagogical practices. The training aimed at the pedagogical specialists from the schools that have received ICT equipment is aimed at improving their technical literacy with respect to the purchased equipment, rather than at supporting them in using this equipment in a new and innovative way. The OPSESG Project „Education for tomorrow" BG05M2OP001-2.012-0001 (2019 - 2022) attempts to change the existing situation by integrating a variety of activities that pursue global goals such as: the opening of education and the educational institutions to using digital technologies by introducing new solutions for better individual training; allowing teachers to apply more precise and effective approaches to each student and to increase students' motivation. Although the project has missed the opportunity to make use of all these activities in order to strengthen the achievement of the goals[103], it can serve as a good starting point in terms of choosing the best approach to investing in ICT. In this sense, it has been recommended for the policy measures to be upgraded in the future to reflect the actual integration between activities in order to strengthen the achievement of educational objectives.

Recommendation: Detailed data should be collected on a regular basis to inform DLE and infrastructure needs as well as the need for ICT. Data collection should be followed by detailed planning of investments in the medium and short term, which would support: 1. the setting goals that cover the actual needs of the educational institutions; 2. the planned depreciation and replacement of ICT technologies in all educational institutions; 3. the gradual provision of access to new technologies for all students.

Lessons learned: „Schools of the Future "America for Bulgaria Foundation

The 9-years of experience of America for Bulgaria Foundation in implementing the Program „Schools of the future" is good example of a know-how for structuring and managing the process of investing in the LE. The Program "Schools of the Future" was implemented in the period 2009-2018 and helped 85 schools across the country to create learning environments based on a new generation of technology. These schools had to apply for funding for different types of learning environments: establishment of laboratories in science, mathematics and information technology; language training centres; agricultural centres, art centres, multifunctional spaces for events, debates and gatherings. The choice of the type of learning environments which were to be created/ upgraded depended on the goals of the applying school

and the stated needs of students, teachers and the school community. The results of the program, measured by 3 impact assessments, showed that the program contributed to: 1) added value in student performance in Natural science, Bulgarian language and literature, and foreign languages (data from the external evaluations). The programme improved the overall well-being of the students (71% of the students in schools from the Programme reported that they were happy to study there compared to 62% of the students in a random sample of schools), students' cognitive skills (reading and interpreting data, basic memorization, long term memory) and students' non-cognitive skills (conscientiousness, sociability, growth mindset, goodwill and resilience). The key approaches that had an impact on the success of the program have been summarised below:

1. **Policy for adopting an integrated holistic approach to financing different types of activities**. The Program was representative of a holistic approach which integrated the investment in the learning environment, while at the same time investing into pedagogical approaches, learning content and leadership potential in the school, all in one project. This approach t ensured the better performance of the students studying in the supported schools.

2. Policy for adopting **one-year cycles investing in a relatively small number of schools as well as the willingness** to adjust some minor features of the Program and then giving other schools the opportunity to benefit from the investments. As an example, i**ndividual support to schools was introduced to help them adjust and adapt their plans for the implementation of the project during the implementation stage.** After a few years of implementation, the organisers of the Program involved individual experts who worked with the ranked schools in order to help them improve their projects and present in a clear way all the aspects which contributed to the financing of the completed projects, which were logically justified and consisted of complementary activities. All these results have been achieved thanks to monitoring the program and measuring the results and proposing specific measures to overcome the weaknesses of the Program. Most of the policies at the national level are implemented rather by a copy-paste method, without examining the effect of the actions taken and without introducing the respective qualitative changes.

3. Policy for **building the capacity of beneficiary schools to raise funds.** Part of the overall approach to financing the educational environment is the requirement for the beneficiary schools to co-finance part of the activities with funds raised in the form of donations. In this way, work was done to build the capacity of schools to raise funds in order to achieve school goals. The building of the capacity of schools involved the support of donations, the active involvement of current and former alumni in the project, and the involvement of the school community in school life. The activity also contributed to building relationships between the beneficiary schools under the program and local and international businesses, which are often among the major donors of the project. Each school that received access to funding from the America for Bulgaria Foundation had to raise at least 25% of the total project cost.

Recommendation:

The collection, analysis and use of successful investment practices implemented by local and national public and private stakeholders could contribute to the faster adaptation of the national investment policy to approaches that have proven to produce predetermined desired results, provided that those results are relevant to the set national goals and priorities. Successful practices and lessons learned from investments in the LE of the Municipality of Plovdiv and the America for Bulgaria Foundation should be adapted and, if appropriate, applied in a national context.

Policy mix effects on implementation level: education institutions and municipalities

Bulgaria has not a formulated concept and targets for the direct LE. The country lacks a vision of the development of the learning environment and a plan for the relevant modernization of the educational institutions on the basis of needs

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assessment and priorities set at the national level. The 2016-2020 policy mix has failed to motivate the educational institutions to plan and develop long-term conceptual strategies for the development of the direct learning environment. The LE investments represent a combined outcome of a variety of programs and investments that are not coordinated and are rarely implemented by a variety of stakeholders. Two key factors have influenced the lack of a specific vision addressing the LE - the existing the educational infrastructure governance [104] and the established approach with respect to program design and implementation which is fragmented from the point of view LE goals and investments. On the one hand, the governance of the educational infrastructure in pre-school and school education has been shared between the principals of the respective education institution and the owner of the entity (the state, the municipality, private individuals). In the case of public institutions the management decisions on infrastructure investments are taken by the principal in coordination with the municipality or the respective ministry as owners of the facility. On the other hand, the available funding programs and the respective eligibility requirements seem to be the main factors influencing the approach, the scope and the decision-making process. Overall there is general coordination between infrastructure investments and the needs at local level that are regulated by the national standards for educational infrastructure. Those rules, however, are not necessarily merged or updated to address the developments with respect to human capital vision and policy plans from the recent years[105].

The LE investments are based on the infrastructure standards that have been implemented by a variety of stakeholders responsible for LE management, maintenance, investment and development:

- delegated school budgets where capital funds are planned and special capital investments are managed by the Ministry of Finance on the basis of the respective financial regulations and the annual decisions of the Council of Ministers. Implementation is coordinated by municipalities as key management units and owners of educational institutions;
- the NPDE programs have been designed and managed by MoES, and coordinated by the regional departments of education (RDE). Annually they provide access to direct LE funding for a group of educational institutions based, in a majority of cases, on a competitive procedure;
- the OP SESG is based on EU funding regulations. It is managed by a dedicated agency and offers competitive and system level projects[106] that have MoES, educational institutions, municipalities and other stakeholders as direct beneficiaries;

- Developmental agencies and a variety of stakeholders, including school boards, plan and implement specific programs following donors' regulations in coordination with municipalities, public institutions and the national legislation.

On implementation level the key instruments do not share common targets:

- the NPDE programs are designed primarily on a yearly basis without setting or addressing any specific mid-term or long-term goals for the LE. The NPDEs fund activities aimed at the modernization of the learning environment as single funding opportunities for the respective educational institutions, restricting those who have already benefitted

[104] The basic principles of educational infrastructure governance follow a long tradition and have been outlined in the Preschool and School Education Act of 2016.
[105] ORDINANCE № RD-02-20-3 of 21.12.2015 for design, implementation and maintenance of public service buildings in the field of education and science, healthcare, culture and arts
[106] System level projects are aimed at the Ministry of Education and Science as a beneficiary, which develops and implements the project using the administrative capacity of the MoES' and RDEs' administration.

from the respective program to expand the investment in the LE for more children (in kindergartens) and students (in schools) by receiving funding from the same program for the following years[107]. Furthermore, achieving an integrated change in the LE has been further complicated by the need for an educational institution to apply under different topics and programs instead of looking for a unified approach contributing to the renewal of the educational environment in an integrated way (see the example of improving the LE for 6th graders below).

- The investment goals of the OPSESG correspond to the national priorities and requirements of the ESIF and do not address the LE specific targets. Demarcation rules are present for distinguishing between nationally funded and OPSESG actions and expenditures focused to administrative and funding rules but not necessarily taking into account the direct LE needs of the respective educational institutions. The OPSESG programs create conditions for mid-term funding, which allows more opportunities for planning on the part of the educational institutions. The adopted approach to applying for funding on an annual basis for some of the projects[108] leads to a greater administrative burden and deprives the educational institutions of guarantees that they will receive funding for the same or upgraded activities in any future period.

As a result, the funding program mix does not stimulate the educational institutions to plan and develop long-term conceptual strategies for the development of the direct learning environment in contrast to policy calls for boosting innovations and creativity across human development sectors. The benefit for the educational institutions and the municipalities has to do with the fact that (i) the investment plan has been shaped by the existing funding programs which are of limited duration (one year for the NPDE and 2-3 years for the EU funded programs) and that (ii) program design does not stimulate planning of learning environment as an integrated part of the process of changing the whole school (including changes in management approaches, pedagogical practices, study material, etc.). In most of the cases kindergartens and schools apply for funding of separate elements of the direct learning environment and comply with the requirements of the respective program. However, there are no instruments that promote and focus on conceptual approaches to the LE as an essential element of the process of school development and improvement. The lack of a shared concept for learning environment goals and targets results in inconsistent stimuli and messages for the institutions - they comply with the stimulus for developing the learning environment imposed by the NPDEs and the OPSESG projects frameworks, the thematic scope of which is not led by the LE specific policy needs regardless of whether they invest in repairs and equipment only[109], or whether they look at the LE from a broader perspective.

Kindergartens in 2020: What does it take for a kindergarten to improve the LE for 6-year olds?

If a kindergarten wanted to equip the classrooms for 6-year old children (4th group) with additional books and learning materials, and experiment with ICT equipment (multimedia and/ or an interactive whiteboard), as well as to make the room accessible to a child with motor difficulties, it had the following funding options in 2020:

[107] If the school has benefited once from the Module „Support for Full-day Schooling in Schools“ under the program "Providing a Modern Educational Environment“ in 2016 for renovations in primary schools, it cannot receive funding under the same program for renovating another classroom for primary education in 2018 under the same program although funding constraints allow for the renovation of 1 classroom, which, for some schools, does not cover all classrooms used for the same purpose.

[108] For example, in the Project **(Your Class) – Phase 1,** BG05M2OP001-2.004-0004, the identification of students' needs and the provision of appropriate activities for the students takes place every year depending on the services registered in the respective village/ town.

[109] NPDE "Creating Accessible Architecture and Security in Schools" (2016-2020), NPDE "ICT in the System of Pre-school and School Education" (2016-2020)

1. No funding for books and learning materials under EU project or the NPED - the Module “Libraries as an Educational Environment” under the NPED "Providing a Modern Educational Environment" is aimed only at schools, and this type of learning materials is not financed under other NPEDs. The OPSESG program "Your Class" is not aimed at pre-schools (the program supports only schools).

2. Possible funding for ICT equipment is available under the NPDE "ICT in the System of Pre-school and School Education” but the NPDE does not specify the funding amount for one institution. Another opportunity has to do with purchasing interactive frontal training equipment from the OPSESG project “Education for tomorrow” BG05M2OP001-2.012-0001: one interactive display with an additional computer module is available only if the applicant is in the list of 60 pre-schools, identified as project beneficiaries in the preliminary list prepared by MoES;

3. It is not clear if kindergartens are eligible to apply for funding for construction of elevators or ramps for children with motor disabilities under the OPSESG project „Support for inclusive education“ BG05M2OP001-3.018 as the funding of equipment for children with SEN is eligible, only if it is required for the implementation of Activity 5 of the project, as it is complementary and should not exceed 20% of the direct costs of the procedure.

What is common for all projects that provide funding for repairs and purchasing of equipment i in pre-schools is that they do not link the elements of the LE to goals and activities aimed at integrating the educational environment in the application of specific pedagogical practices, or in achieving specific educational results.

Schools in 2020: What does it take for a school to improve the LE for 6th graders?

To modernize the learning environment for students in lower-secondary school and repair a classroom for the 6th graders, equipping it with multimedia and digital devices, a small library with books and educational aids/models, and making it accessible for a child with mobility impairments, the school should apply for funding under 3 different NPs by submitting 3 different applications and under one EU funded project:

- Module Support for All-day Schooling in Schools under NPDE „Providing a Modern Educational Environment” (2020): applying in a competitive procedure for funding for the repair and provision of equipment for classrooms used for conducting activities related to reading, drawing, games and recreational activities; maximum funding of BGN **10 000 for a school**;

- Module Libraries as an Educational Environment NPDE „Providing a Modern Educational Environment” (2020) applying in a competitive procedure for funding for new books for school libraries, according to the needs and interests of the students and for creating a corner for reading - an informal cozy reading environment; maximum funding of **BGN 1 500** for new books and **BGN 2 500** for construction and furnishing of a reading corner for a school.

- NDPE “ICT in the System of Pre-school and School Education” (2020) applying in a competitive procedure for the provision of equipment for frontal training (interactive displays), computer equipment (computers, laptops, tablets, etc.). No information on the maximum amount of money per school in the NPDE.

If the needs of the school are different from what the NPDEs in 2020 finance or if the school does not meet the eligibility criteria of the respective NPDE, the leadership team will have to revise the plan, seek for funding through other alternatives or wait for the next year funding proposals.

In 2020 a possible alternative for the school is to provide at least ICT equipment for the students in the 6th grade under the OP SESG Project "Education for tomorrow" BG05M2OP001-2.012-000 (2019-2022). In order to do this, the school has to meet the following criteria: 1) the school has to be part of the list of the preselected 1940 beneficiary schools (almost all schools in Bulgaria) and 2) the school should not have benefited from the project activities in 2019 project year. Even after fulfilling these requirements, the school has a limited budget which can be spent on ICT equipment according to assigned credit units, meaning that by equipping the classrooms in which the sixth-graders study with frontal teaching equipment and / or laptops, the other classrooms will be left without such equipment. The MoES selects and publishes a list of equipment, from which the schools request certain numbers according to their needs and according to the credit units at their disposal. The amount of these credit units (respectively access to more pieces and/ or more expensive equipment) is directly related to the number of students in a school.

The access to funding under the NPDEs and OPSESG projects has been limited by a number of administrative requirements that outline the profile of eligible educational institutions (according to the number of students, the profile of the subjects studied, the educational level, etc.) resulting in restrictions with respect to the funding of beneficiaries. In the case of the NPDE this is directly linked to the high fragmentation of the programs. The complex eligibility criteria put multiple limitations on accessing the NPDE funding. Each program restricts the profile of applicants on the basis of different criteria. On the one hand, such an approach helps to focus the specific intervention in one specific direction. But on the other hand, it creates barriers and restrictions for some of the institutions to receive funding under the program: most of the programs are specifically restricting the profile of eligible institutions by formulating criteria that inform a final ranking list. While such an approach improves transparency and facilitates the administrative processes, some of the educational institutions do not have a chance to receive funding despite the fact that they are formally eligible applicants. It is not clear why from the perspective of LE needs and development such limitations are needed. Activities for which no competitive procedure is applied finance equipment and materials[110]. Most NPDEs (distribution of larger amounts) are organized on the basis of ranking within a competitive procedure where higher scores are assigned for schools based on pre-defined criteria, including the number of students. Competitive procedures require good administrative capacity on the part of institutions and their ability to defend their concept of investing funds in order to achieve particular results. All these factors lead to an unequal distribution of funds aimed at improving the educational environment among schools of different sizes, giving preference to larger schools. Students enrolled in smaller schools or in schools whose management does not possess experience or administrative capacity have less chance to access larger funds according to funding criteria.

[110] [110]. In 2020, for several activities in NPDEs, the maximum amount of funding is below 5000 BGN.

2020 scope of programs addressing LE: access for education institutions

202 0 LE mix	(NP "Providing a Modern Educational Environment)					(NP "Creating Accessible Architecture and Security in Schools")		(NP "ICT in the System of Pre-school and School Education");	"We Succeed Together"	(NP "Building STEM Environment in schools")	OPSESG „Education for tomorrow" 2019-2022	OPSESG "Support of Dual Learning System" (2020 - 2023)
Type of institution	reading corners and purchase of new books for school libraries	Playgrounds (indoors or outdoors) for learning Road safety	Room for reading, drawing, games and recreational activities	Lab equipment	training classrooms for vocational training	Video surveillance and systems for access control	Elevators and ramps for children with motor difficulties	ICT equipment	Module "It's nice in the Kindergarten "	Creating a STEM environment	ICT for visualization of learning material	Purchase of equipment and materials for the purposes of dual training.
Kindergarten	⛔	✓	⛔	⛔	⛔	⛔	⛔	✓	✓	⛔	✓	⛔
Municipal primary or sec. school	✓	✓	✓	✓	⛔	⛔	⛔	✓		✓	✓	⛔
State primary or sec. school	✓	✓	✓	✓	⛔	✓	✓	✓		✓	✓	⛔
A municipal high school, preparing students in a general education profile or a VET profile which is not part of the national list of priority specialties	✓	⛔	⛔	✓ VET profile is in Natural science	⛔	⛔	⛔	✓		✓	✓	✓
A municipal VET high school, preparing students in a specialty that is part of the national list of priority specialties	✓	⛔	⛔	⛔	✓	✓	⛔	✓		✓	✓	✓

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202 0 LE mix	(NP "Providing a Modern Educational Environment)					(NP "Creating Accessible Architecture and Security in Schools")		(NP "ICT in the System of Pre-school and School Education");	"We Succeed Together"	(NP "Building STEM Environment in schools")	OPSESG „Education for tomorrow" 2019-2022	OPSESG "Support of Dual Learning System" (2020 - 2023)
Type of institution	reading corners and purchase of new books for school libraries	Playgrounds (indoors or outdoors) for learning Road safety	Room for reading, drawing, games and recreational activities	Lab equipment	training classrooms for vocational training	Video surveillance and systems for access control	Elevators and ramps for children with motor difficulties	ICT equipment	Module "It's nice in the Kindergarten "	Creating a STEM environment	ICT for visualization of learning material	Purchase of equipment and materials for the purposes of dual training.
A state VET high school, preparing students in a specialty that is part of the national list of priority specialties	✓	⛔	⛔	VET profile is NOT in Natural science	✓	✓	✓	✓		✓	✓	✓

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- *Private vs. public educational institutions:* Directing the public resources for institutional development only to state/municipal institutions puts non-public providers in unequal position in terms of accessing development funds that promote educational standards, practices and development. The NPs are not open for non-public providers even in the cases when public provision is not able to address the demand and is underutilizing the NPs for promoting topics, standards and practices across providers. The NPs are open only for state and municipal institutions in the system of pre-school and school education. Private kindergartens and schools, as well as the centers for children with SEN and part-time child-care centers,[111] from the list of institutions that have access the mix of public funding of the national learning environment priorities.

The case with preschool access

The lack of access to funding from additional public sources such as the NPDEs and the OSESG projects for private educational institutions could hardly be accounted for, especially in the context of the recent policy developments and the needs of pre-school education further to the new regulations for compulsory enrollment of four-year olds and the challenges for ensuring access to pre-school education in big cities such as Sofia, Plovdiv and Varna (where there are not enough public kindergartens and parents are supposed to use the services of private kindergartens and child-care centers). With the adoption of the new Pre-school and School Educational Act (2016) the system introduced a key reform allowing for private kindergartens and schools to access the single cost standard for children. This approach of making public funds accessible to private educational institutions could be developed by including the private educational institutions in the list of eligible beneficiaries of public projects funded through the NPDEs and the OSSESG projects, especially when the projects are aimed at ensuring access to education.

- *Rich vs. modestly funded educational institutions*: The set of eligibility criteria for the LE applicants might put the smaller schools at a disadvantaged position. The NPDE requirements often include ranking criteria that are restrictive with respect to certain groups of educational institutions as applicants - they cannot earn enough points compared to applicants with a more appropriate profile. An example in this context is the inclusion of the number of students as a criterion in the NPDEs that require competitive procedures. In this way, the small schools are considered eligible applicants but put restrictive terms for receiving points by linking them to the number of students. Bearing in mind the fact that there are no specific programs that address small schools, the restriction with respect to the number of students in the ranking procedure practically limits the opportunity for smaller schools to receive funding and puts students in small schools at a disadvantaged position in terms of access to opportunities for improving the educational environment.

[111] Centers for support of personal development (NP „Provision of Modern Conditions for work of children and Students in Personal Development Support Centers (2020) and State and Municipal Centers for Special Educational Support (NP "Modern Educational Environment").

Three examples that link the access to funding under the NPDEs and the OPSESG with the number of students in schools:

NPDE "Creating Accessible Architecture and Security in Schools", In Module "Security" (2020) - the ranking points depend on the proposed price of equipment in relation to the number of students. In this way, smaller schools are put at a disadvantaged position, given the fact that the costs of installing surveillance cameras and access control mechanisms at entries are more or less the same.

NPDE "Providing a Modern Educational Environment", Module Improving the Conditions for Experimental Work in Natural Sciences (2020) - the applicants are ranked on the basis of 3 indicators:1. Amount of co-financing (up to 20 points); 2. Number of students in relation to the largest number of students in a school which has received funding under this module of the NP for the academic year in which the application is submitted (up to 40 points); 3. Number of students admitted and educated in the school in accordance with the school curriculum in natural sciences during the last three school years (up to 40 points). 80 out of 100 of the ranking points depend on the number of students in the school, which makes it impossible for smaller schools to qualify for funding simply as a result f the number of students.

OPSESG Project „Education for tomorrow" BG05M2OP001-2.012-000 (2019-2022) where the additional equipment is distributed among different schools on the basis of credit units for each school which depend on a single minimum base to which a coefficient is added according to the number of students in that particular school. The amount of these credit units (respectively access to more pieces and / or more expensive equipment) is directly related to the number of students in a school. This approach benefits middle and larger schools and puts smaller schools (usually in depopulated and rural areas) at a disadvantaged position to receive only 1 interactive display, along with an additional computer module. This approach allows funding to reach as many children as possible but contributes to increasing educational inequality through the inadequate funding of schools.

- *Fragmentation of the content-oriented approaches:* **the** NPDEs provide funding for strictly specific goals which fail to take into account the broader context and which do not reflect the funding approach used in implementing the comprehensive vision and the development strategy of the respective educational institution. In some of the cases, the funding restrictions arise from the nature of the respective NPDE. For example, the funding of road safety playgrounds (NPDE) is provided only to schools working with students up to the 7th grade as road safety is relevant only to the primary level of education. This is not the case when it comes to the restrictions with respect to the eligible institutions under the NPDE "Providing a Modern Educational Environment", Module Libraries as an Educational Environment" (2020), where only schools are eligible for receiving funding. It is not clear why kindergartens have been denied access to funding for achieving the same objectives under the same NPDE. Kindergartens have been the institutions that are subject to the largest number of restrictions with respect to their access to funding.

Recommendation: Funding should be managed in a way which creates opportunities for financing a wider range of institutions, without administrative restrictions and using a mechanism guaranteeing

that all needs have been addressed. The NPDEs might benefit from adopting a consolidated approach to funding by financing the complete renewal of the learning environment rather than by addressing various aspects of the learning environment under different programs and procedures without coordination. With good planning and implementation, such an approach could allow the upgrading and accumulation of individual activities in a way that contributes to fulfilling the objectives by achieving a cumulative effect for the same beneficiaries.

School education: **The lack of balance in terms of access to LE funding is present across the system as a result of the nature of program design, targeting and eligibility, and affects disproportionally pre-school education while favoring school education.** The LE focused programs are primarily addressing school education due to the lack of systemic planning focused on the LE and associated needs, the lack of relevant knowledge and efforts to prioritize LE needs and fragmented planning. The thematic scope related to schools is generally focused on VET, STEM, ICT. Schools in the system of general education have access to funding from a number of programs that finance the development of the learning environment related to curriculum support or investment in ICT equipment. A novelty of the policy approach has to do with grouping of the beneficiary schools into categories in order to address their different needs when applying for funding under the OPSESG: funding has been provided for extracurricular activities conducted in all types of state and municipal schools, and hence for the respective educational environment under the OPSESG project Your class[112] where the beneficiary schools have been categorized into 8 groups[113] (on the basis of which the type of extracurricular activities they included in the curriculum and the amount of funding have been determined). The type of extracurricular activities prioritized for a particular school and the amount of funding per student has been differentiated in accordance with the group in which the school was allocated. All schools could decide what kind of extracurricular activities they will offer to their students taking into account the requirements for a minimum number of students covered by a certain type[114] of extracurricular activities. The concept for dividing beneficiary schools in groups on the basis of objective criteria makes it possible to differentiate the approach and refine the interventions according to the needs of students. Such an approach provides access to funding for all schools, taking into account the number of students and other objective factors, while funding interventions focused on improving the educational outcomes as it links the funding in LE to the curriculum. Overall, as DLE is not the primarily focus of those activities and due to the lack of minimal planning on LE , the effect to L needs and concepts remains marginal.

Recommendation: MoES could improve its LE targeting strategy addressed by the NPDEs, the OPs and other funding instruments by setting certain LE profiles of schools. In order to develop conceptually the

[112] Development of school students' abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1, BG05M2OP001-2.004-0004

[113] The main criteria taken into account for the grouping of schools into 7 categories include indicators such as: percentage of students who have learning difficulties; access to various extracurricular activities (depending on the type of location and distance from the big city); students' results, etc. There is a separate eighth group - special schools, due to the lack of quantitative assessments related to the learning outcomes of students there.

[114]For example, a school with a concentration of students with learning difficulties is obliged to organize extracurricular activities aimed at overcoming this problem by creating conditions for the participation of a minimum number of students calculated on the basis of a formula.

investments in the LE MoES could use investments to meet the needs of certain categories of schools and integrate this into other investments. The experience under the OPSESG Project BG05M2OP001-2.004-0004 "Development of school students' abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1" can be used to inform the wider application of the differentiating strategy when funding educational institutions and adjust it to LE disbalances. The proper identification of specific groups of schools on the basis of objective criteria can solve many current problems, such as the limited access to funding for smaller schools. The categorization of schools aimed at the prioritization of nvestments will also help in planning the investment policy in the medium term.

VET: **Vocational education schools are a specific priority area for the LE policy mix and have access to almost all MoES LE specific investments.** VET schools are subject to uncoordinated and fragmented funding and need funding to develop their administrative capacity for participation in different projects and procedures. On the whole, no specific efforts have been made to support the system capacity for developing projects. Vocational schools have access to all NPDE modules that address the development of the learning environment, with the exception of two modules[115], both of which support the LE development at introducing new curricula related to younger students (road safety is studied in primary school and rooms for reading, drawing, games and recreational activities are used for supporting whole - day schooling in school which is organized for students in primary and lower-secondary education). VET schools have access to all programs that address the schools of general education schools as well as to the specific funds listed below:

- NP "Providing a Modern Educational Environment", module „Modernization of Vocational Education" (2016-2020) (2020- 2023) which provide funding for repair end equipment of training classrooms for vocational training

- OP SESG project „Support of Dual Learning System", BG05M2OP001-2.014 – 0001 which provides funding for the purchasing of tools and equipment, simulation systems, application software products, consumables, work and protective clothing and personal protective equipment, etc. similar, necessary for the implementation of the internship in schools in order to prepare for the transition to practical training in a real work environment.

- NP "Providing a Modern Educational Environment", Module Improving the Conditions for Experimental Work in Natural Sciences which provides funding for repair works, renovation and purchasing of new equipment for laboratories in Natural sciences for schools with VET profile in Natural sciences.

The municipal VET schools are not eligible to apply for funding only under the NP "Creating Accessible Architecture and Security in Schools".

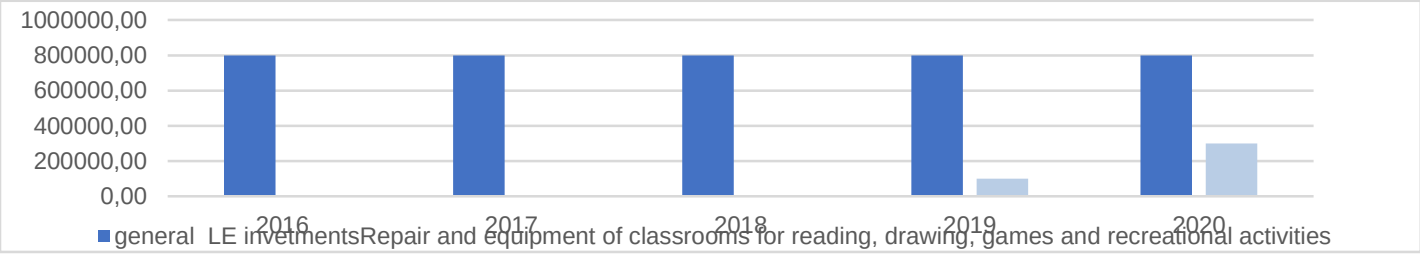
[115] NP "Providing a Modern Educational Environment", Module „Playgrounds for Road Safety" (2020) and NP "Providing a Modern Educational Environment", Module „Support all-day schooling in schools" (2016-2020)

The approach of providing vocational schools with a wide access to almost all funding mechanisms should be applied to other types of educational institutions in order to enable more such institutions to invest in the development of the learning environment. MoES needs to develop a sound monitoring system for assessing the outcomes of the interventions. Consolidation and targeting of funds is needed for manage the policy efforts and VET change.

MoES should consider the development of a special contingency fund to address equipment needs and to replace the annual programs by a strategic fund that addresses equipment needs. This process might be informed by VET reforms in Latvia that pursued a planned investment in VET infrastructure and DLE renovation packed with consolidation of VET provision and VET practical work oriented planning.

Preschool: **While most of the investments have been focused on school education, pre-schools have been addressed by a lower number of programs and reduced variation of topics that interrelates within the present LE investment opportunities.** Few programs address directly preschool LE under both the NPDEs and the OPSESG despite the fact that pre-school institutions represent approximately half of the educational institutions in the country. Three out of the fourteen NPDE modules addressing the LE (2020) are aimed kindergartens, offering significantly less financial resources. The funding of kindergartens in 2020 has been directed to three general areas: 1) activities addressing the curriculum that refer to the repair and equipment of Road safety playgrounds (indoors or outdoors), 2) access to specialized equipment funds – ICT limited to one classroom and 3) general LE investments targeting the work with 3-year olds and framed as repair and equipment of classrooms for conducting activities related to reading, drawing, application and games and recreational activities. The OPSESG has includes kindergartens in half of the projects that are relevant to the LE (2 out of 4). While it is not possible to go into detail and analyze the access of kindergartens to funding under the project „Support for inclusive education" BG05M2OP001-3.018 (2020-2023) as it is still being conceptualized by MoES, the project „Education for tomorrow" BG05M2OP001-2.012-0001(2019 - 2022) leaves much room for analysis. By design, this project severely restricts the access of kindergartens to funding allowing access to the project to only 60 kindergartens (only 60 kindergartens have been pre-selected by MoES). Even kindergartens that have been selected and included in the list of MoES have access only to the activities related to purchasing equipment (Activity 2), and the professional qualification of teachers (Activity 3). They have access neither to the activities related to the development of educational content (Activity 4), nor to the organization of extracurricular activities for digital literacy for children (Activity 6).

Table 4. **Access of pre-schools (light blue) to general LE funding under the NDPE 2016-2020**



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The limited access of kindergartens to funding projects focused on the LE, including projects promoting STEM, innovation, the access of children with SEN to education, needs to be revised and addressed by MoES. Pre-school education lays the foundations of learning, cognitive curiosity, the attitude to lifelong learning, the development of key competencies. It stimulates creativity, education in tolerance and acceptance of children with SEN. Investments in the LE that integrates STEM and contributes to the development of competencies thus creating conditions for the development of a positive attitude towards learning, creativity and acceptance of diversity ,should in the first place be targeted at kindergartens. Therefore there is no logic behind excluding pre-school institutions from the list of beneficiaries under the NPDEs. Overall, the funding of kindergartens under the NPDEs is low (the largest amount under the NPDEs, to which kindergartens have access, is BGN 2000 under the NP „Providing a Modern Educational Environment"), therefore such funding cannot be used for implementing major changes in the LE. Moreover, in order to receive funding for each of the activities listed in the table, kindergartens should submit a separate application form which increases the administrative burden and makes it difficult to plan a comprehensive, integrated approach to renewing the educational environment in pre-school education. One of the possible explanations for the rare presence of kindergartens in the list of beneficiaries under the NPDEs and OPSESG has to do with the structure of ownership and financing of pre-schools which are mostly funded by the respective municipality, with the responsibility for securing funding remaining at the local level. The lack of a national policy for financing key elements of the educational environment in pre-schools, along with the fact that many municipalities do not have sufficient funds to invest in the development of educational infrastructure, including the renewal of the learning environment in kindergartens, leads to the no investments whatsoever in the LE of kindergartens located in poorer and economically less developed municipalities.

Recommendation: Early childhood development and education are among the priorities of the educational system. Therefore investments in the LE in kindergartens should not be dependent on the economic opportunities at the local level, but should be supported by targeted investments at the national level. Investing in the development of the LE in kindergartens would increase their capacity to provide quality education and in this way would support the achievement of the goals of the educational system. Kindergartens should be added as eligible beneficiaries under all NPDEs and under the OPSESG projects funding the LE in order to support early childhood care and education. This would allow the educational institutions working with young children to gain access to funding, which for many educational institutions is the only possible way of developing the LE.

Finally, the local authorities have been faced with serious challenges in terms of financing large projects aimed at investing in the educational environment. They rely mainly on funds from the national budget to cover the needs of schools and kindergartens located on their territory. With the changes in the educational standards introducing compulsory pre-school education for 4-year old children and with the introduction of new requirements at the national level[116], municipalities have been constantly challenged to optimize the existing educational infrastructure and to support educational institutions at the local level to meet the standards. As the delegated budgets of municipalities are not sufficient to cover major

[116] In September 2020, with a change to the PSEA, compulsory pre-school education was introduced for 4-year-old children, which implies an increase in the capacity of kindergartens and schools that provide pre-school groups.

repairs and investments in equipment, various measures are being taken at the national level to support educational institutions and municipalities in meeting the new requirements. The Program „Construction, reconstruction, adjustment and upgrade of kindergartens and school buildings" (2020 - 2022) is such an example, as it is targeted at supporting large municipalities in which there is a large shortage of places for children in kindergartens, building new facilities to meet the new requirement for inclusion of 4-year-olds in compulsory education. Similarly, the update of the educational standard for sports grounds and road safety playgrounds in 2019[117] required the inclusion of the Module „Playgrounds for road safety" in the NP „Providing a modern educational environment". In addition to that, some municipalities decided to contribute to the process of building, repairing, renovating, securing and certifying playgrounds and/ or sports grounds in kindergartens and schools by investing from their own budget. The Municipality of Plovdiv has planned to invest BGN 2 000 000 for a period of three years in two programs aiming at same goals as the national standard. Most of the municipalities have not developed their own vision and strategy for the development of the LE in educational institutions with municipal funds due to insufficient own funds and/ or low administrative capacity, and have therefore limited their role to allocating funds from the national budget to local educational institutions. In this way, the support for meeting the requirements of the changing standards has been received mainly at national level with the NPDEs and OP DSESG projects used as guiding instruments for support.

In 2020: What does it take for a municipality to improve the direct LE?

The infrastructure management approach for pre-school and school education enables municipalities to play a key role in investing in the LE. Municipalities, as owners of most of the buildings of schools and kindergartens in Bulgaria, can contribute to the development of the LE by supporting the national investment policies through co-financing them and by investing in their own local LE policies and goals in order to meet the specific needs of the local educational system. The financial resources at the disposal of the municipalities aimed at funding LE development locally are as follows:

- **Targeted funds for the delegated budgets of the municipally-owned schools.** Although the majority of schools in Bulgaria are owned by the municipalities, **only a small percentage of the funds received by municipalities can be spent at their discretion** because the financing is carried out according to statutory formulas, which are applied by the municipalities as a primary administrator of the funds.
- T**arget funds directed from the state budget through the National program** "Construction, reconstruction, adjustment and upgrade of kindergartens and school buildings" (2020 - 2022). Eligible institutions are the municipalities with more than 10,000 inhabitants with a minimum shortage of 20 places for kids in kindergartens/schools. In 2020 these are only the big municipalities with lack of places.
- **EU funds, mainly through the OP "Growing Regions" (2014 - 2020)** for construction, reconstruction, renovation and equipment of municipal schools; sports infrastructure.
- **Municipal budget (own revenues)** depend on a number of factors (population, economics). In a total of 265 municipalities on the territory of Bulgaria the financial situation varies significantly. The municipal budget is a flexible tool for addressing the specific needs of the local educational institutions and for

[117] ORDINANCE № RD-02-20-3 of 21.12.2015 for design, implementation and maintenance of public service buildings in the field of education and science, healthcare, culture and arts, updated with amendment from 04. 09. 2020

supporting the bottom-up system which is mainly used by larger municipalities with higher revenues. Most of the municipal budgets do not presuppose the implementation pf significant investment programs.

The additional investments in the LE at local level made by the municipalities are difficult to summarize due to the heterogeneous nature of the approach of the respective municipality. The Municipality of Plovdiv, for example, chooses a holistic approach to strategic planning of investments in education with medium-term scope investing resources from the municipal budget coming from its own revenues. The municipality is guided by goals and priorities set for 5 years ahead, investing purposefully in activities that contribute to achieving the local priorities and goals. The preliminary strategic planning and distribution of investments in key priorities by the municipality of Plovdiv leads to stability, predictability and sustainability of investments. It is important that the priorities are set taking into account two key elements: (i) the needs of educational institutions in the system (where are they in terms of LE, pedagogical practices, management practices, achieved goals) and (ii) the needs of the local community for educational development (where institutions need to be in order to meet the needs of the local population and the local economy). A good example is the Program „Modernization of the educational process" which aims to financially support schools in r the purchasing of modern technological equipment, specialized classroom equipment, as well as in the acquisition of software products and licenses, which in turn contributes to the modernization of teaching methods and the introduction of the so-called "cloud technologies and platforms". The Program has been implemented since 2016, and the first stage was completed in 2019 by including **all of the 52 municipal schools,** which have activated their profiles, in the cloud platforms (G suite for education and Windows 365). This approach is not typical for most municipalities – the existence of a local educational strategy is rare and the planning of investments in the educational environment is in most of the cases done of short-term basis.

What are the lessons learned with respect to the approach of Plovdiv Municipality?

1. The approach of the Municipality of Plovdiv shows that the preliminary strategic planning and distribution of investments in key priority areas leads to stability, predictability and sustainability of investments. It is important that the priorities are set taking into account two key elements: (i) the needs of the educational institutions in the system (where are they in terms of LE, pedagogical practices, management practices, achieved goals) and (ii) the needs of the local community for educational development (where institutions need to be in order to meet the needs of the local population and the local economy). This comprehensive approach allows the accumulation of investments under specific programs over a longer period of time in order to achieve sustainable results.

2. Another lesson from the experience of the Municipality of Plovdiv is related to the need for investments to be made in stages, starting from a smaller scale and expanding after achieving the expected results. All sustainable programs of the Municipality start with several schools or kindergartens by exploring different partnerships and different approaches, measuring the effect and only then follows the dissemination of practices which have proven to be successful in the given context. Adopting this approach in planning and implementing investment intentions at the national level would lead to similar results.

3. Montessori program

The Municipality of Plovdiv has invested municipal budget funds in the LE through the so called "the Montessori program" which has been implemented by the Municipality of Plovdiv since 2016 and which invests in a variety of activities that fully serve the educational institutions in creating a learning environment and in preparing teachers to apply the pedagogical approaches typical of the Montessori method. Apart from the renewal of the learning environment (repair activities in kindergartens and schools, provision of didactic materials), the Montessori program also purposefully provides funding for: (i) specialized trainings for teachers and non-

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pedagogical staff in kindergartens and schools to develop their skills to apply the Montessori method; (ii) professional support to the teams applying the Montessori method by supervision provided by experts from the country and abroad; (iii) exchange of experience and good practices through participation in forums, conferences, etc. events related to the development of educational policies (at the national and international level); (iv) activities aimed at attracting parents as active participants in the educational process and increasing their competencies for the application of the Montessori method, including financing the development of a Parents' Guide; (v) initiatives with international and local organizations and professionals; (vi) development of a curriculum for children in kindergartens and students in primary schools to be proposed to the MoES and adapted as a national curriculum; (vii) evaluation of program implementation. Every year the number of educational institutions and the number of teachers that work with the Montessori method grows. Over the years the number of kindergartens and schools which make use of the Montessori method has expanded steadily. By 2019, over 1,200 children in 7 kindergartens, 2 schools and 1 nursery were trained to apply the Montessori pedagogy. More than 120 teachers from Plovdiv have gone through various qualification and training courses, including Master's programs designed in cooperation between the Municipality of Plovdiv and New Bulgarian University.

The practice of Plovdiv Municipality is based on the implementation of a medium-term strategy for the development of education. This strategy could be adapted, upgraded and used both by other municipalities and programs managed at national level. Strategic planning and the inclusion of an impact assessment of the investments are part of the measures that should be applied to NPDE and OP SESG planning.

In the context of strategic policy ambitions for innovations and economy of knowledge the Bulgarian government could use the LE instruments to promote policy goals through an integrated LE concept. There is a lack of predictable medium-term investment planning on the NPDE development and this limits the planning options for education stakeholders with respect to the LE. In the context of the restrictions of annual planning, the change of thematic funds that address the LE, the lack of clarity in terms of the profiles of eligible institutions and the lack of sustainable planning might discourage the educational institutions. When an educational institution is not approved for funding under the NPDE, it could submit a new project proposal that addresses the same topic during the following year, if the program is sustainable. The development of a clear concept for improving the learning environment based on policy goals has been recommended: investments in the conceptualized renewal of the LE in all educational institutions for a given period of time (5-10 years), describing the main criteria for prioritization of investments in a certain type of educational institutions or a certain type of LE. The management of funding through projects that have set larger, common objectives that allow for the contextualization of activities used to achieve these objectives will give the educational institutions the opportunity to use the funding they receive to fulfil their own strategies and vision. Such an approach will also reduce the administrative burden for both the funding body and the beneficiaries as the development and implementation of one project will serve the different needs of the educational institutions.

Recommendation: To develop a clear concept with respect to the LE development goals along with a plan for LE investments in all educational institutions on the basis of their specific needs for a given period of time (5-10 years) by setting criteria for prioritization of investments. The information on the status of the learning environment could be updated throigh relevant data submitted by the

educational institutions on an annual basis thus informing the key decisions with respect to the policy mix.

Being part of the plan for the development of the LE, the concept of the "learning environment" should be clearly defined, including a list of factors that support its development that need to be taken into account in the design of the investment programs.

The implemented projects should allow the educational institutions to use the funding opportunities in order to fulfil their own strategies and vision. Such an approach would reduce the administrative burden for both the funding body and the beneficiaries as the design and implementation of one project would be used to serve the different needs of the educational institutions.

V. DLE profiles of institutions to inform planning

To observe trends and direct learning environment outcomes in Bulgaria and inform planning and strategic work a proposal for two strand approach is extended to MOES comprising of:

(I) Collection of additional data on specific aspects and elements of direct learning environments to inform needs and planning and program design. This process has been initiated and is ready for final discussion and application of the instrument. The proposal is developed in section 2.3.;

(II) Development and application of typology of education institutions based on learning environment profiles

The World Bank team has established, based on MOES 2020 dataset, the following typology of education institutions, determined by learning environment characteristics and focused to direct learning environment. It is composed of combination of findings on general renovations and direct learning environment renovations:

Type	**Renovation of Buildings**	**Renovation of direct educational environment (DLE)**
Group 1 No renovations/investments	No	No
Group 2 Buildings only	Partial/full	No
Group 3 DLE Facilities only	No	+digital classrooms +subject specific classrooms + STEM +library +activity room

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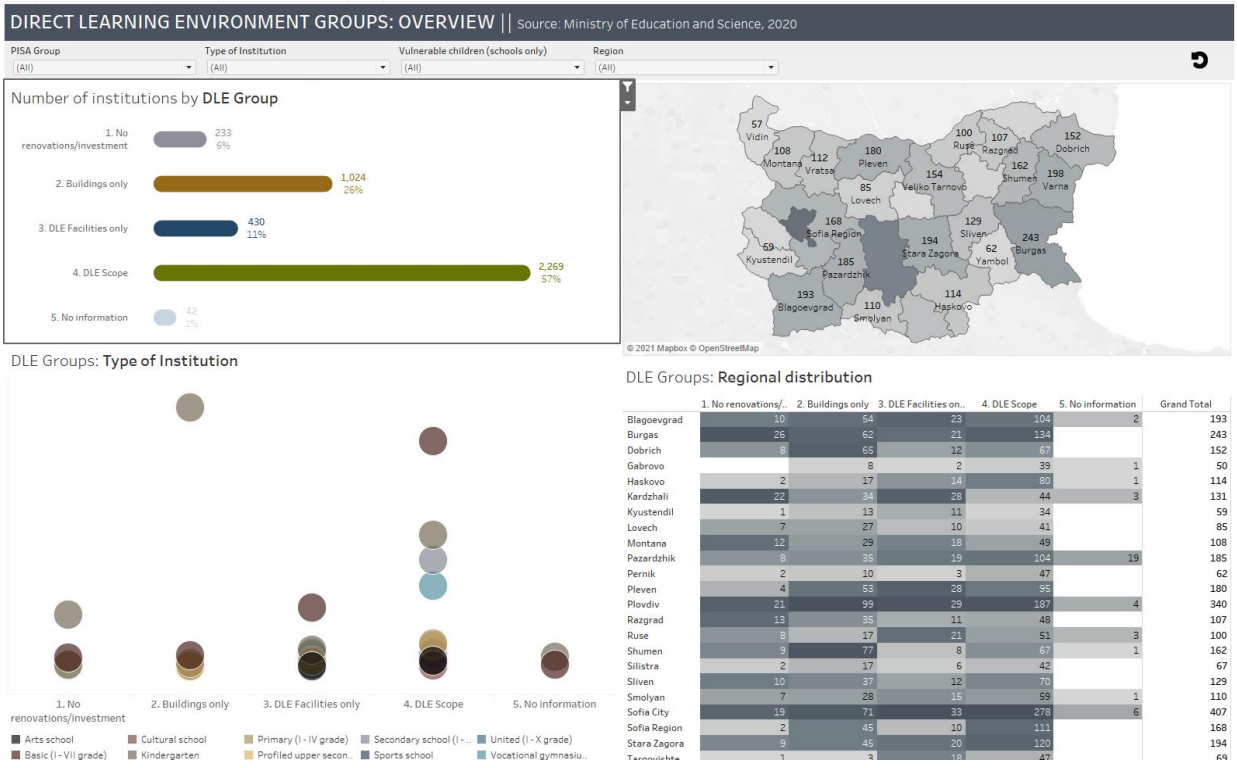
Group 4 DLE scope	Partial/full	+digital classrooms +subject specific classrooms + STEM +library +activity room
Group 5 No information	No information provided	No information provided

Detailed information and interactive data on LE and renovations, as collected by MOES in 2020 are presented as annex in Tableau file – Learning Environments 2020.

Five DLE groups of institutions have been created to help understand the profile of investments in LE between 2010-2020 and current needs including how different types of educational institutions use the various types of funding to finance DLE improvement and what elements of DLE are targeted mostly. It allows to identify the types of institutions and regional areas where DLE investments are lacking and identify the need to strategic allocation of recourses. In this sense, each educational institution belongs to selected DLE group and has DLE profile characteristics (e.g. a kindergarten, which belongs to Group 2).



	1. No renovations/..	2. Buildings only	3. DLE Facilities on..	4. DLE Scope	5. No information	Grand Total
Blagoevgrad	10	54	23	104	2	193
Burgas	26	62	21	134		243
Dobrich	8	65	12	67		152
Gabrovo		8	2	39	1	50
Haskovo	2	17	14	80	1	114
Kardzhali	22	34	28	44	3	131
Kyustendil	1	13	11	34		59
Lovech	7	27	10	41		85
Montana	12	29	18	49		108
Pazardzhik	8	35	19	104	19	185
Pernik	2	10	3	47		62
Pleven	4	53	28	95		180
Plovdiv	21	99	29	187	4	340
Razgrad	13	35	11	48		107
Ruse	8	17	21	51	3	100
Shumen	9	77	8	67	1	162
Silistra	2	17	6	42		67
Sliven	10	37	12	70		129
Smolyan	7	28	15	59	1	110
Sofia City	19	71	33	278	6	407
Sofia Region	2	45	10	111		168
Stara Zagora	9	45	20	120		194

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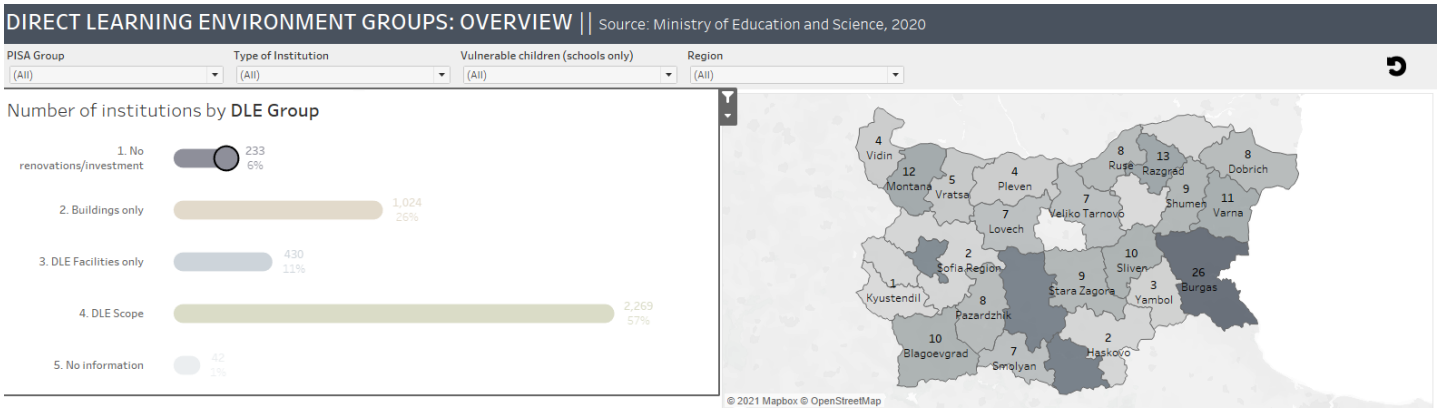
In 233 institutions there haven't been any investment in LE during 2010-2020 based on MOES dataset. Those institutions needs to be addressed by specific programs and to have access to dedicate programs that address on only the infrastructure need but promote new DLE concept focused to learning. His subgroup could be a specific pilot group for promoting an innovative approach that promotes ESF+ and National strategy 2030 priorities, focused to learning and competences. Details and specific data on those and other subgroups are available in the Tableau files provided.



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The distribution of the investments varies depending on the group's characteristics and DLE elements. According to the MOES data, approximately 2% of all institutions didn't provide any data on rehabilitation or new construction of building interiors, DLE and outdoor facilities. As shown on the Figure 22, a quarter of all educational institutions invest only in building repairments and do not target any element of DLE, while only 10% of all educational institutions invest in rehabilitation of DLE only. At the same time, the structural distribution of DLE facilities elements suggest that the educational institutions invest mostly in the improvement of subject specific classrooms and inclusive learning spaces, but the STEM-associated investments are lagging (see Figure 23).

Figure 22. Number of institutions by DLE groups

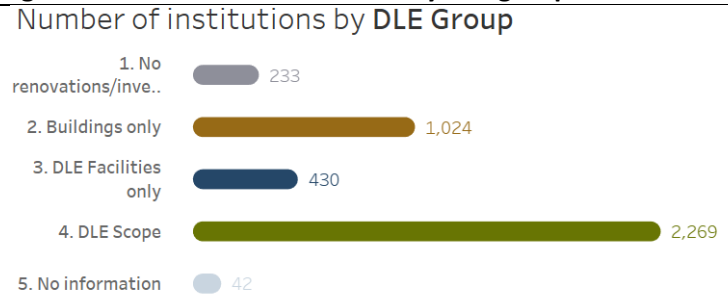
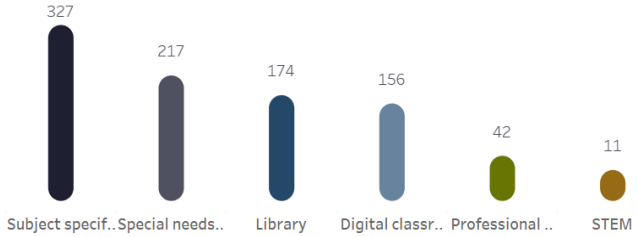


Figure 23. DLE structural elements (DLE facilities only)



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The investments for DLE improvement vary depending of the type of institutions. The basic and secondary schools at the general education level, kindergartens and VET professional gymnasiums are among the leading educational institutions, which are investing either directly in DLE or in combination with building repairments (see Figure 23 and 24).

Figure 23. DLE facilities only renovations

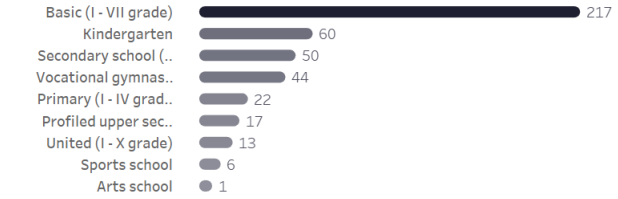
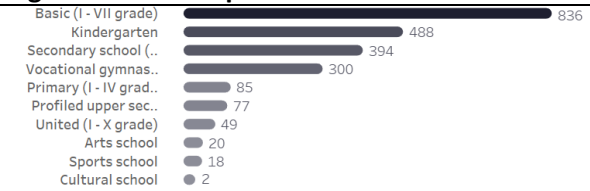


Figure 24. DLE scope renovations



The DLE groups are further analyzed through learning outcomes, inclusive policy perspective, funding:

– Vulnerable students: MOES introduced a specific grouping of schools based on the distribution of vulnerable students. This information is integrated to educational infrastructure renovation data to allow one to observe the coverage;

– PISA groups – based on the Programme for International Student Assessment groups applied in Bulgaria. PISA groups all 28 regional authorities into 11 groups where students' results are representative only for the group but not for the region. To inform links to learning outcomes in secondary school data for educational infrastructure renovations is linked to PISA groups; below Group 1 report is demonstrated.

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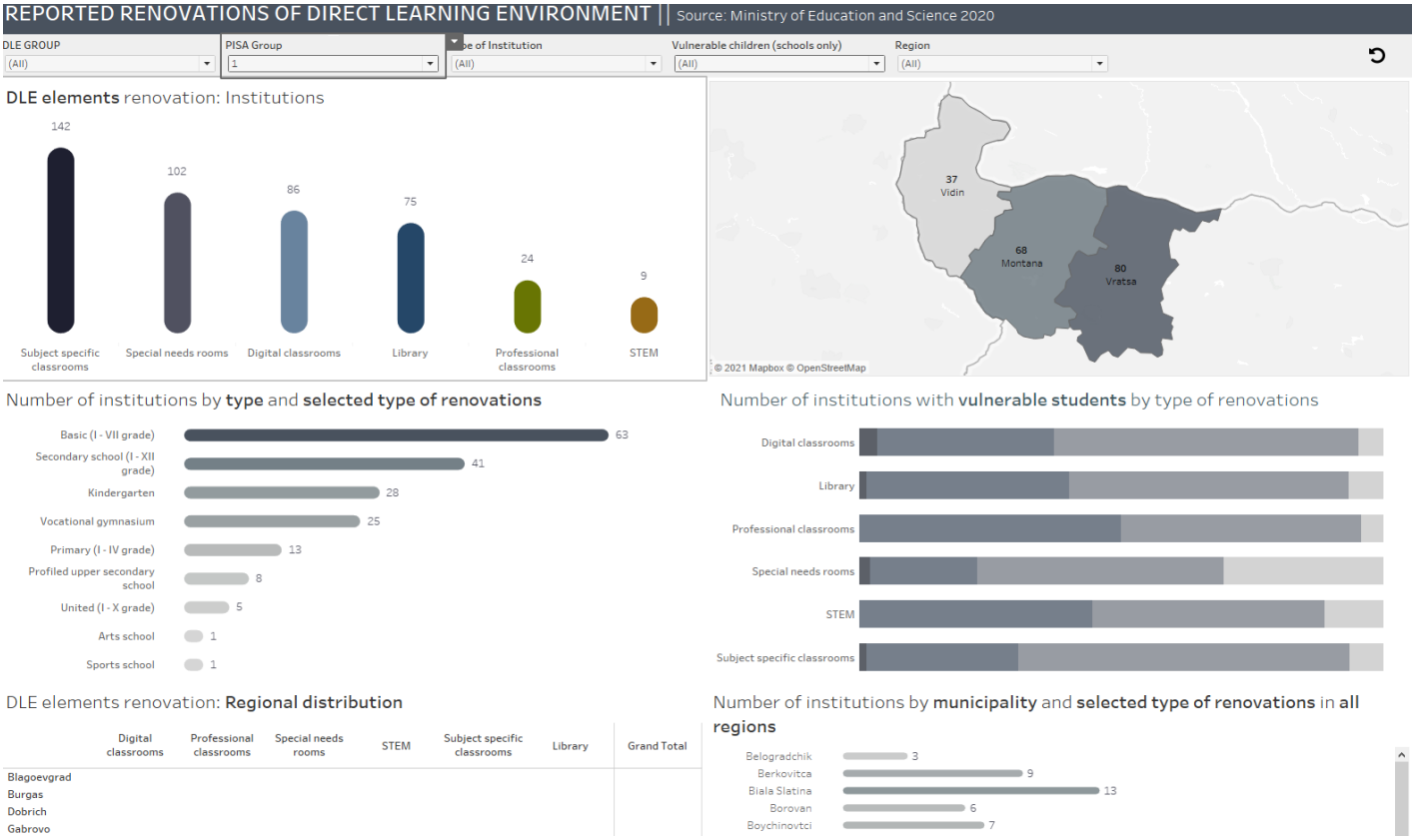

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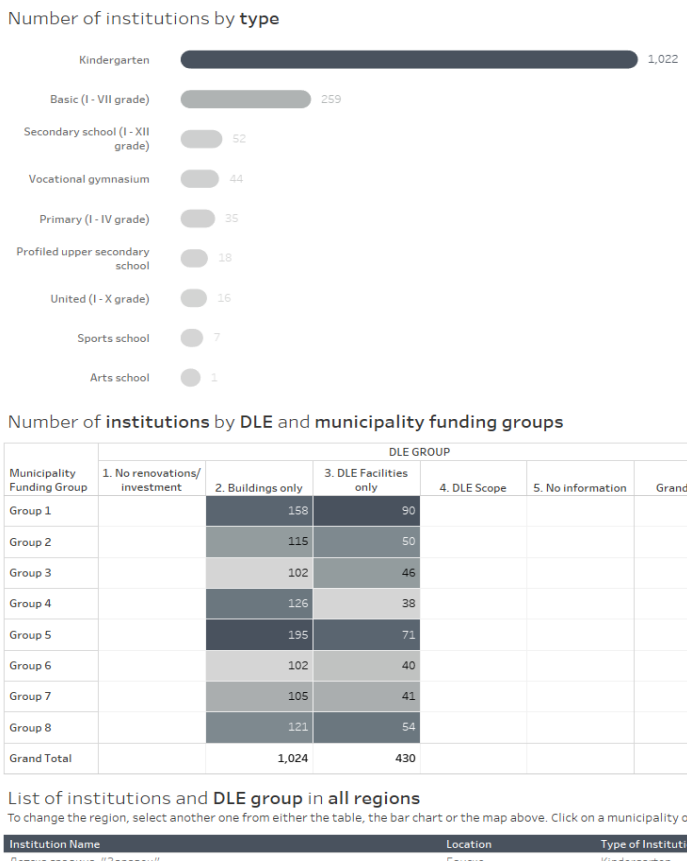

Veliko Tarnovo	56	12	68
Vidin	16	6	22
Vratsa	26	15	41
Yambol	8	10	18
Grand Total	1,024	430	1,454

Number of institutions by **DLE** and **PISA groups**

	DLE GROUP					
PISA Group	1. No renovations/i..	2. Buildings only	3. DLE Facilities only	4. DLE Scope	5. No information	Grand Total
1		71	39			110
2		71	33			104
3		122	47			169
4		134	48			182
5		87	67			154
6		82	32			114
7		62	21			83
8		37	15			52
9		197	55			252
10		73	33			106
11		88	40			128
Grand Total		1,024	430			1,454

Number of **institutions** by **DLE** and **municipality funding groups**

	DLE GROUP					
Municipality Funding Group	1. No renovations/ investment	2. Buildings only	3. DLE Facilities only	4. DLE Scope	5. No information	Grand Total
Group 1		158	90			248
Group 2		115	50			165
Group 3		102	46			148
Group 4		126	38			164
Group 5		195	71			266
Group 6		102	40			142
Group 7		105	41			146
Group 8		121	54			175
Grand Total		1,024	430			1,454

DLE groups: Distribution of institutions in the **municipalities** of **all regions**

To change the region, select another one from either the table, the bar chart or the map above.

	DLE GROUP					
	1. No renovations/ investment	2. Buildings only	3. DLE Facilities only	4. DLE Scope	5. No information	Grand Total
Aitos		5				5
Aksakovo		2	3			5
Alfatar		1				1
Anton		1				1
Antonovo		1	3			4
Apriltci		1				1
Ardino		3	4			7
Asenovgrad		8				8
Avren		2	2			4
Balchik		9				9
Banite		1				1
Bansko			3			3
Batak			1			1
Belene		1				1
Belogradchik		1				1

List of institutions and **DLE group** in **all regions**

To change the region, select another one from either the table, the bar chart or the map above. Click on a municipality on the left to narrow down the list of institutions.

Institution Name	Location	Type of Institution	Vulnerable children (schools only)	DLE GROUP

Full version with dynamic graphs is available in Annex - file Learning Environments 2020

During 2010-2020 municipal funding is the primarily source for LE investments. MOES data set is not allowing to link specific type of LE investment with data source, so this analysis has been limited by the MOES data collection instrument design. Overall, it is recommendable the instrument to be developed and further specified to allow for more specific and policy targeted observations. In general, all the renovations (Groups 2,3 and 4 combined) are mostly financed through the municipal funding or local budget of an educational institution. Another half is dedicated to the national funding through different national and regional operational programs. At the same time, the education institutions, which implement only rehabilitation of specific DLE facility element, usually use the funds of the Ministry of Education followed by the local budgets and municipal finance (see Figures 25 and 26).

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Figure 25. Funding (Building + DLE + DLE scope)

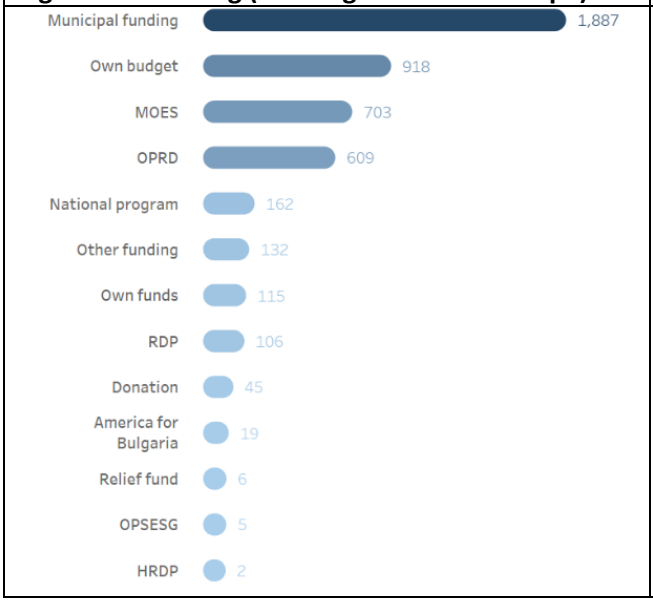
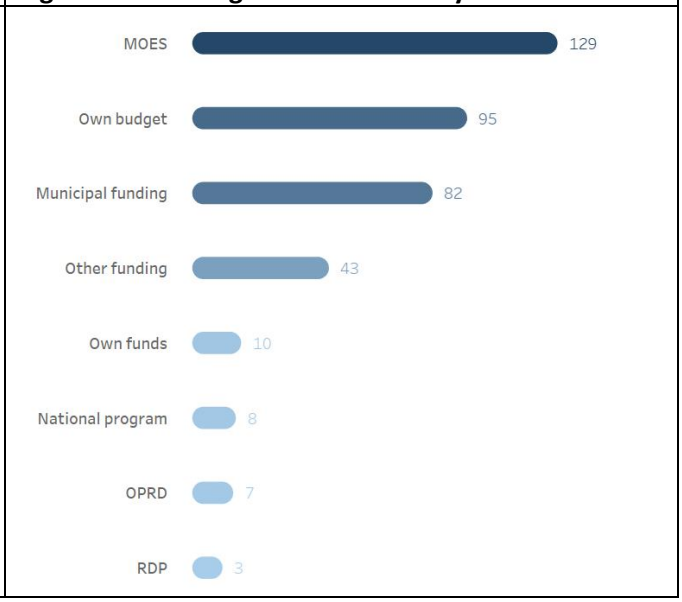


Figure 26. Funding DLE Facilities only



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The needs assessment provided by MOES data 2020 suggests that education institutions are hugely influenced by funding proposals and limited in developing a specific vision and communicating need. When compared to Strategy 2030 objectives, the needs state at institutional level are focused to basic infrastructure needs. The MOES questionnaire allowed the institutions to indicate the needs for the future rehabilitation and construction. All the answers are divided into four main groups:

- Infrastructure, which includes main administrative and technical facilities, engineering networks and upgrade of the buildings in terms of improving the access for the children with SEN;
- Direct Learning Environments, which includes activity-rooms (playrooms), digital classrooms, furniture, STEM areas, libraries, subject specific classrooms;
- Inclusive Spaces (inclusive education areas and for children with SEN);
- Sport Facilities.

According to the data, 75% of educational institutions require the rehabilitation of different structural elements of DLE, while 67% need to construct completely new classrooms, activity rooms, libraries and STEM areas. Creating a new inclusive learning environment, which help those students with learning differences, is needed in 31% of educational institutions. At the same time, 13% of educational institutions plan to rehabilitate existing learning areas for the children with SEN.

Figure 27. Investment profile versus LE needs 2020

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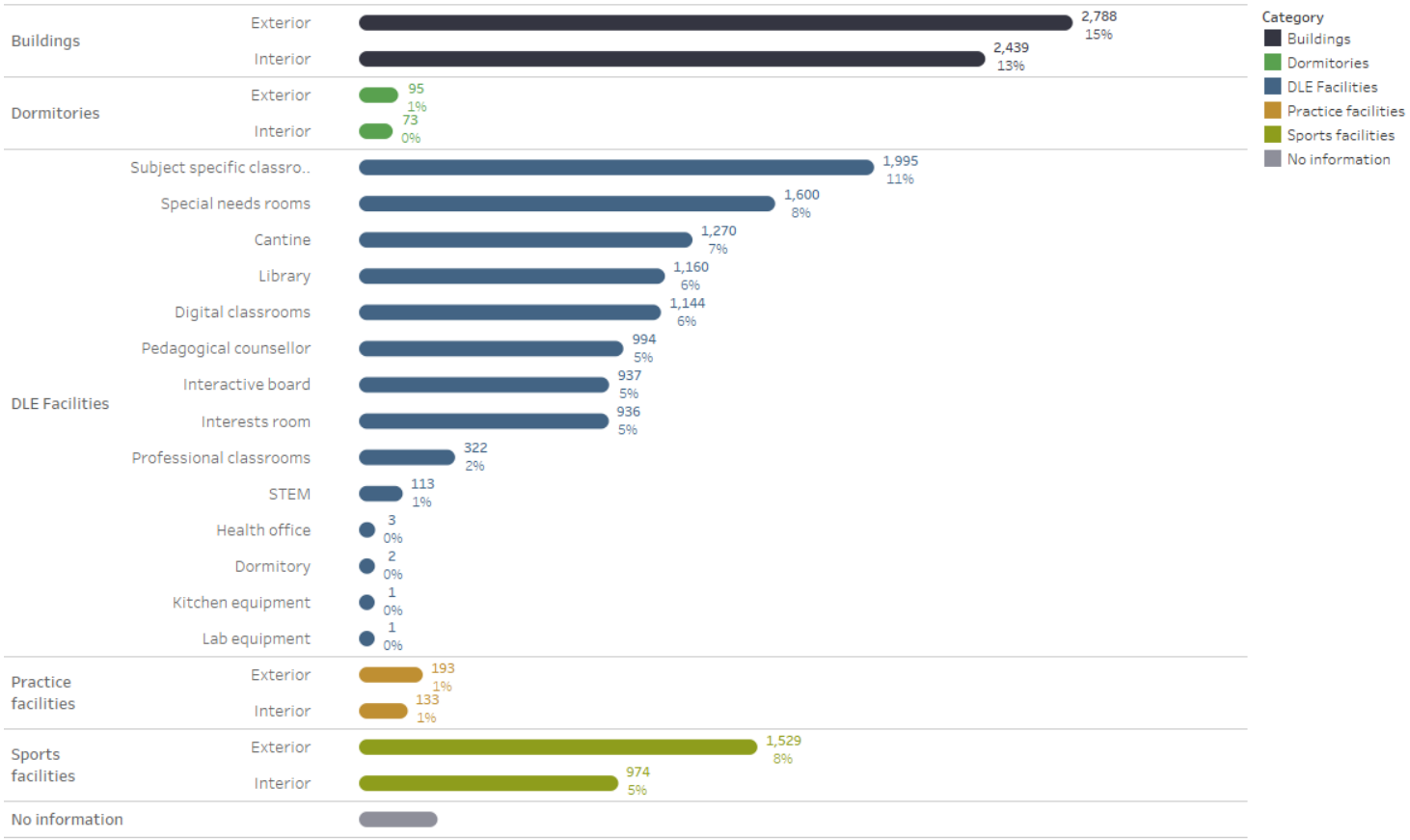
Reported renovations **by type**

Number of institutions and **percent of all reported renovations**



The trends of AVG(0) and Number of institutions for Subcategory broken down by Category. Color shows details about Category. The marks are labeled by Number of institutions and Overview: % of renovations. The data is filtered on Region, Municipality, PISA Group, Type of institution and Vulnerable children (schools only). The Region filter keeps 28 of 28 members. The Municipality filter keeps 264 of 707 members. The PISA Group filter keeps 11 of 11 members. The Type of institution filter keeps 17 of 16 members. The Vulnerable children (schools only) filter keeps Null, Group 1, Group 2 and Group 3. The view is filtered on Category, which keeps 6 of 12 members.

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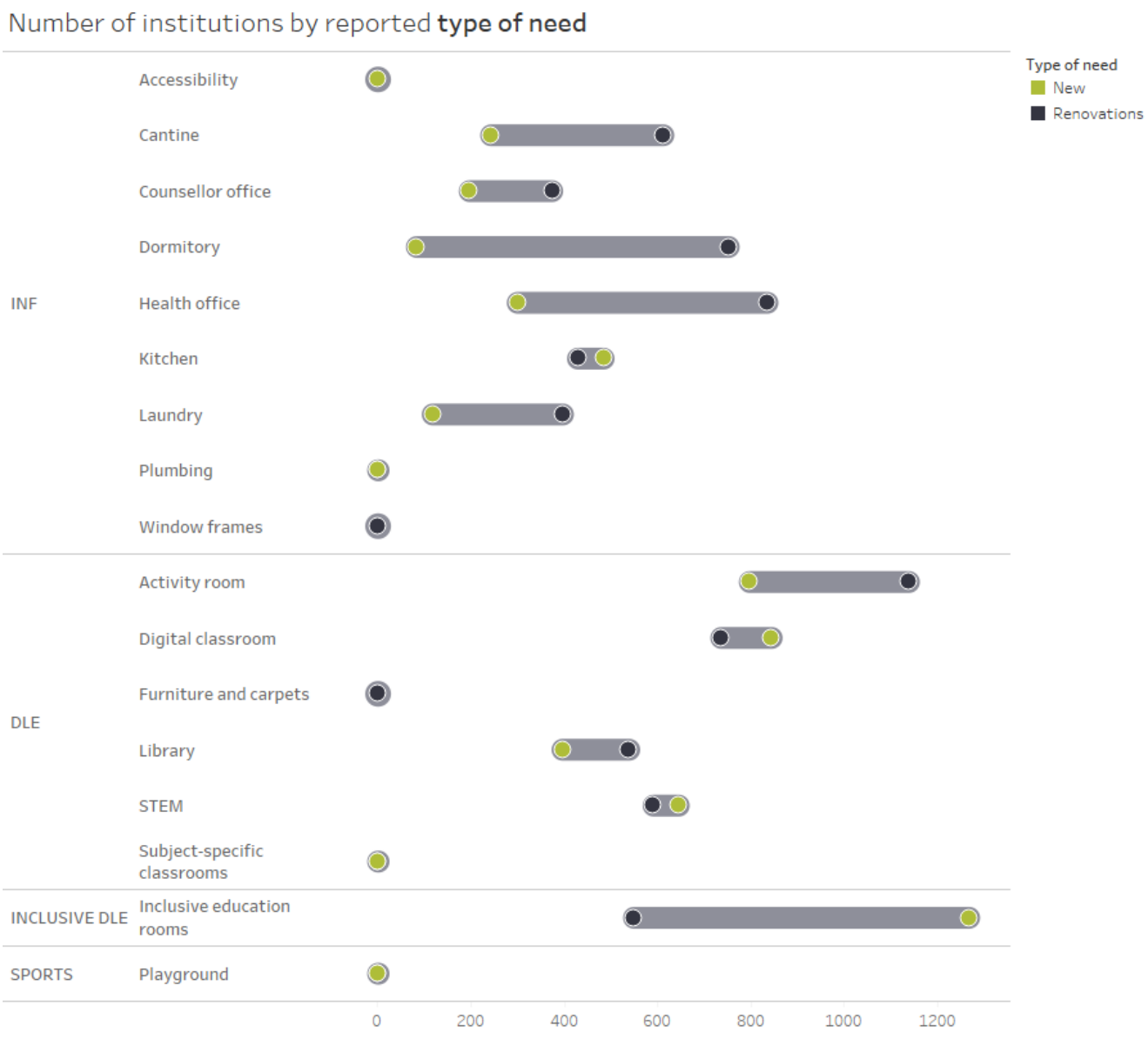

The trends of Number of institutions and Number of institutions for Subcategory broken down by Type of Need Group. For pane Number of institutions: Color shows details about Status (RENOVATIONS). Details are shown for Type of Need tooltip. The context is filtered on Category and Status (RENOVATIONS). The Category filter keeps Facility needs. The Status (RENOVATIONS) filter keeps New and Renovations. The data is filtered on Region, PISA Group, Type of institution and Vulnerable children (schools only). The Region filter keeps 28 of 28 members. The PISA Group filter keeps 11 of 11 members. The Type of institution filter keeps 10 of 16 members. The Vulnerable children (schools only) filter keeps Null, Group 1, Group 2 and Group 3.

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Full version with dynamic graphs is available in Annex - file Learning Environments 2020

The development and usage of such analytical tolls as DLE profiling/groupings allows to allocate existing DLE investments from overall building rehabilitations, identify limitations of current investments in DLE and prepare the recommendation on long-term improvement of DLE. The instrument might help to address the regional differences in DLE funding and identify geographical areas and educational institutions, which should be better targeted.

In general, the data collection and monitoring of DLE investments should be improved and should be based not only on collection of structural data, but also on self-assessments and external evaluations, including the collection of the data on DLE usage. This will help to create high quality DLE and ensure the connection to the pedagogical approaches.

MoES could improve its LE targeting strategy through the NPDEs, OPs and other funding instruments by applying LE profiles of education institutions. The proper identification of specific groups of schools and the use of objective criteria could solve many current problems, such as the limited access to funding for smaller schools. Categorizing schools for the purpose of prioritizing investments according to different types of schools could also contribute to investment policy planning in the medium term. On the basis of MoES LE data on renovation investments for 2020 five key groups of institutions have been proposed by the WB team by type of LE to be used for integrating and managing DLE investments under the MoES funding instruments.

Following the recommendation of the new ESF+ regulation on creating equal access to all level of education, specifically for vulnerable groups and supporting learning mobility, it is important MOES to consider including learning environment as a part of the project design components together with new curricula, learning courses, which are introduced for ECEC, general education and VET sectors. International studies show that pupils' satisfaction with school environment and better psychological climate with lower level of bullying might impact learning outcomes of the children, especially from lower socio-economic groups.[118] Soft measures on upgrade of learning environments could be included in the project design (participatory exercises to develop new learning environments layouts with the different groups of children, evaluation of the needs of users to create equal access to the learning environments and education process, upgrade of furniture and equipment in connection with the project objectives, introduction of teacher practices, which envisage change of learning environments). Following the lack of investments in the conceptual development of learning environments (aligned with education concept) in Bulgaria, these activities will help to develop LE as a key component to address learning and development goals.

[118] Shmis, Tigran; Ustinova, Maria; Chugunov, Dmitry. 2020. Learning Environments and Learning Achievement in the Russian Federation : How School Infrastructure and Climate Affect Student Success. International Development in Focus;. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/32598

Tableau dataset and analytical framework provided are a ready to be used instrument for planning and program support instrument. In the broader context of strategic development, comprehensive and evidence-based policies it will be an essential requirement for targeted OECD membership. The Government is expected to develop and maintain integrated and sustainable information to inform policy implementation and plans. Learning environment data are essential for guaranteeing equality of access and to influence competence-based policies targeting learning. The World Bank team stands ready to support the further strengthening and developing of DLE analytical tool and support MOES in strengthening capacity for analysis and planning.

Annex 1. The key findings and recommendations on direct learning environments improvement across sectors

Findings	Recommendations
Early childhood development	
In preschools more than 90% of direct learning environments' renovations include partial and major repairs of buildings' interior and upgrades of playrooms and sleeping facilities, however the information about the connection between spatial arrangements and learning concept is limited. The better design and daily utilization of sleeping areas might carry the potential to improve the capacity of ECEC institutions.	• Major renovations in ECEC institutions should be planned and implemented in line with pedagogical concepts and contemporary trends in designing LE, which are flexible, transformative, diverse, inclusive and supporting play. It is important to incorporate the LE concept in the National ECD curricula, which should determine and provide connection with other LE standards and regulations for preschools (please refer to the page 35 of this report). • More focus is needed on the improvement of actively used space for children in the ECEC institutions. Bulgaria should use international practices and elaborate its concepts for optimization of available spaces and develop more interactive spaces accommodating multiple functions and activities, including play, sports, interactions, time for rest and self-reflection. Similar approaches and investments addressing optimization of sleeping facilities, corridors and common space in education institutions are recommended (please refer to the pages 37 and 40 of this report).
Sport facilities and playgrounds. In majority of the cases ECEC institutions completed simple rehabilitation of open-air sports facilities and *playgrounds* signaling for lack of conceptual investments in playgrounds. It is also important to highlight, that 19.9% of ECEC institutions in Bulgaria do not have an *outdoor sport or playground facility* at all. In the	• Investments and introduction of minimum requirement for outdoor sports and playground facilities to facilitate child development, early learning, physical activities and healthy behavior of children in ECEC institutions are needed. Such focus could influence the ambition of the Education strategy to balance between

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same time almost two-thirds of Bulgarian ECEC institutions lack *interior sports facilities.*	traditional education purposes and 21st century skills targets for the system (please refer to the page 41 of this report). • Indoor sport facility in preschools might provide a good opportunity to avoid sedentary behavior, promote physical activity, interaction and learning. The MOES and Ministry of Health should prioritize such investments to promote physical activity and healthy lifestyles in preschool. This focus could be aligned with the concept of Green preschool/school introduced by National Education Strategy (please refer to the page 41 of this report).
Inclusion/SEN facilities. At the preschool level, only third (32%) of institutions organized areas for the children with SEN, while 27.9% upgraded the furniture and equipment.	There is a need for more detailed analysis of the existing stock of LE for inclusive education and children with special educational needs
MOES has not collected data on preschools and is not addressing them currently with STEM program options.	In addition, available data is demonstrating existing expectation from preschools to participate in STEM creative processes and policy developments. Thus, if the ECEC institution are incorporating STEM elements in their curricula and learning content, it is advisable to develop the recommendations for the design of interior environments in preschool premises with regards to STEM disciplines and activities.
The information on preschool facilities usage and its connection to curricula is limited	The collection of preschool users' (teachers, children, directors, parents) subjective perception of and satisfaction with LE could complement structural assessment and data collection on the ECEC institutions. The WB team designed a questionnaire for this purpose, although these evaluations could be done through a focus-group interview too. The MOES can use similar self-assessment measures for DLE audit in order to assess the quality of existing preschool DLE and take investment decisions in education infrastructure development, which address learning and child development.

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General Education	
Preschool group spaces/Transition LE. There are no details and information on the investments in preschool spaces in schools.	Development of special guidelines for LE in preschool groups established in the framework of general education facilities and jointly used areas for preschool-age and primary school-age children. It would ensure the creation of safe, stimulating and comfortable environment for the children, who transition from early childhood settings to school settings.
Less than half of the Bulgarian schools completed the major renovations of buildings interior. At the same time, there are differences between the types of schools which implement the overhaul. The schools also report the needs in rehabilitation and new construction of basic infrastructure (canteen, health office, director office), as well as DLE (classrooms, digital classrooms, inclusive education spaces, STEM and libraries).	Additional review of the barriers for future renovation is needed. The MOES could recommend applying multifunctional approach and active space optimization principle in renovation of these school areas. Introduction of DLE self-audit and presentation of DLE conceptual vision by educational institutions could be used as a selection procedure for funding.
Outdoor/Indoor sport facilities. One third of sport facilities were renovated in general education schools, while half of primary schools and one third of basic schools are still missing the outdoor sport facilities (please refer to the page 43 of this report).	The MOES should promote the introduction of indoor, outdoor sports and playground facilities across general schools to facilitate physical activities and healthy behavior among the children. The sport/playground areas are especially important for child development in the context of preschool groups in the general education settings and primary schools. In addition, the approach to support physical activity in schools can be developed in line with the Green School concept introduced in the National Education strategy, which includes component on healthy lifestyles.
Inclusion/SEN spaces. The biggest focus in developing inclusive spaces remains in secondary schools, as well as basic schools. According to the MOES data, 79,2% of secondary schools established the dedicated spaces for the work with the children with SEN, while 58,2% upgraded the furniture and equipment related to inclusive education. 49.5% of basic schools	Current MOES data are limited for more detailed analysis of existing LE for inclusive education and children with special educational needs in general education settings. MOES could prioritize additional information collection on regional scope, needs and limitations of current LE for teachers and SEN children, as well as relevance to policy goals on inclusive education.

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established the rooms for the children with SEN at their premises and 33.8% upgraded the furniture and equipment.	
STEM-centers. The proportion of STEM-classrooms varies across different types of school institutions but overall is STEM concept is limited. The new STEM priority that MOES is promoting, requires systemic investment and planning. During the last years, some schools established separate STEM-classrooms or dedicated specific classes for the STEM areas. The biggest share of the STEM-classroom belongs to the specialized gymnasiums (14,7%), which is explained by their learning profiles. 8.5% of secondary schools obtained this learning area, less than 2% of primary schools have STEM environments.	There is a need for more detailed assessment to understand the needs of schools for STEM centers creation and how they use existing facilities. The international experience show that the STEM/digital areas could be arranged everywhere in the school premises and many countries design so-called STEM schools, where the learning content impact the overall planning of learning environments. The MOES might benefit from the fact that the National "STEM" program is at the early stage of the implementation and incorporate best international practices of STEM learning spaces design in order to facilitate optimal usage of LE and increase active space per child (please refer to the pages 46 and 47 of this report).
Teachers room. The teacher room is the biggest focus of renovation for all types of institutions, including general education: 93.7% of primary, 93.8% of basic, 95.5% of secondary schools, and 96.8% of specialized gymnasiums.	MOES could continue with further analysis on the quality and elements of teacher's room renovation and how it is supporting everyday work, health and psychological comfort of the teachers at their workplace as a component of teacher policy and HR management packages. Limitation of the data set is not allowing for detailed analysis in this direction (please refer to the page 40 of this report).
Vocational Education and Training	
Practice base. VET and practice base spaces have been renovated in 21.5% of professional gymnasiums and 16.4% of united schools renovated spaces for practice.	Detailed analysis of the practice base elements usage by students and teachers might help to identify further needs of VET institution in LE and possible areas of cooperation with industry partners in developing of such LE. It is important to investigate possible overlapping of practice base with the other LE and to ensure optimal usage of these areas.
STEM-Centers. The biggest share of the STEM-classroom in the VET sector represented by professional gymnasiums (6.1%), unified schools (4.1%) and sport schools (4%).	• The proportion of STEM-classrooms varies across different types of VET institutions, but overall representation of STEM still remains low. Following the approach of

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	MOES in development of STEM-centers, which represent the collection of several classrooms and areas with a common focus on STEM disciplines, it would be important to monitor learning process organization, use of innovative teaching methods and incorporate best international practices of STEM learning spaces design in order to facilitate optimal usage of LE and increase active space per child.
Teacher's room. 98.6% of united schools, 96.2% of professional gymnasium, 96.0% of sport schools, and 69.7% of art schools renovated teacher's rooms.	Same as with general education settings, MOES could continue with further analysis on the quality and elements of teacher's room renovation and how it is supporting everyday work, health and psychological comfort of the teachers at their workplace as a component of teacher policy and HR management packages.
Outdoor/Indoor sport facilities. The following types of institutions providing VET completed renovation of open sport facilities: united schools, (44.4%), professional gymnasiums (19.2%) and art schools (17.4%). MOES data reveal that 68% of specialized sports schools do not have access to open sports facility, as well as 60% are missing the closed sports facility. Among VET institutions these are professional gymnasiums (20.1%) and art schools (34%). In terms of closed sports facilities, the VET sectors are represented by unified schools (43.8%), professional gymnasiums (20.9%), and art schools (26%).	It is important to ensure high quality outdoor sports and indoor facilities in VET settings to facilitate physical activities and healthy behavior of students.
Inclusion/SEN spaces. Among the VET institutions, 53.4% of united schools and 32.8% of professional gymnasiums also have the rooms for children with SEN. On the contrary, only 8.7% of art schools renovated spaces for inclusive education.	Further analysis is needed to observe the geographic distribution based on national education strategic priorities on inclusion and support the planning. WB team stands ready to support MOES in this direction when specific information on the planning and/or distribution or needs is provided.
The data on LE usage is limited.	The collection of VET institutions users' (teachers, students, directors, industry provider) subjective perception of and satisfaction with LE could

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	complement the MOES data collection on the VET institutions. Such information will help to understand how the students and teachers are using modern DLE and what are the areas of quality improvement. The self-assessment can be done through the questionnaire developed by the WB team.
National Policies on Learning Environments	
• Around 1 in 3 students in the country studied in a school that faced a lack of physical infrastructure; 1 in 5 students studied in a school with inadequate or poor-quality physical infrastructure. • The lack of digital preparedness is particularly apparent for primary schools in the country • 60% of students study in schools where an effective online learning support platform is not available. • 58% of students study in schools where the number of digital devices for instruction is not considered sufficient by the school directors. • Computer to student ratios are slightly lower in Bulgaria, compared to the OECD average. (PISA 2018) • 8% of schools are facing lack of teaching staff according to principals in comparison to 27% for OECD. Between 2006-2012 the reported need for teachers consistently reduced from 23% to 8% in Bulgaria (PISA 2006-2018) • According to PISA 2018 data, there are strong regional differences in availability of educational materials are present in the country. • Physical learning environment in the country differs considerably across regions. • Socio-economic factors do not define the poor physical learning environment.	• Regional disparities and school data indicate that MOES should address poor LE and existing lack of infrastructure through coordinated policy measures that integrate and take into account the complexity of LE elements instead of fragmented investments focused on separate components in ECEC, general education and VET sectors. • MOES could address LE disparities by developing policies, which stimulate education institution to plan and conceptualize learning environments, based on the establishment of LE profiles for institutions and stimulus to integrate investment with learning and teaching concepts. • Targeting the investments towards the creation of LE that have direct connection with the pedagogical approach and are better suited to the needs of students and teachers, as well as the local community. This will help improve the quality of the educational facilities and provide an opportunity to use the funds, allocated to innovations more efficiently. • Revising and optimizing the existing sanitary, construction and fire-protection standards, which regulate the creation and maintenance of educational facilities, in order to (i) address contemporary trends in education approaches, learning environment development, as well as construction and engineering technologies; (ii) address policy targets and more

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	Rather, the education system policy and developments are influencing learning environment developments.	specifically the new policy goal to ensure equal access to quality learning spaces for all four year old children. It will be important MOES to stimulate and lead an inter-agency dialog on this topic to bridge ideas, needs, planning and fundraising approaches in order to build a continue of practices that build upon the existing decentralized approach for LE decision and management. • Guided by policy targets addressed by Education Strategy 2030 (21st century skills, competence based learning, green concepts, citizenship and participation) to develop and provide guidelines to a broad scope of stakeholders addressing learning environment - the national design and education professionals, policy officers, experts on construction and rehabilitation of educational buildings, investments agencies responsible for capital investments. To promote contemporary approaches and international best practice. • A challenging task might be to create a task force to coordinate the efforts of different agencies in developing high-quality educational facilities. MOES could start exploring subjects and activities that gain support and are of common interest for the variety of stakeholders addressing investments in learning environments. • Joining the international dialogue on LE developments in order to collect best international knowledge, but at the same time to promote the national practices. Regular participation in the OECD Group of National Experts on Effective Learning Environments (GNEELE) could become a platform for such exchange and level for policy developments addressing learning.
General recommendations for National Strategy		

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- **Teacher support and qualification programs are natural and successful instruments in incorporating and addressing LE through a concept approach focused on teaching and learning.** The teacher is a key agent in developing and using the contemporary LE. In the context of Strategy 2030 and future investment plans this approach could be considered as key to address LE through a mix of elements addressing learning – teacher practices, teaching materials and direct LE infrastructure elements (subject specific, classroom, activity room, library, STEM-classroom, digital classroom, etc.).

- **MOES needs to develop and coordinate its investment in LE through national funds by consolidating all the programs and funding.** It should replace fragmented activities and administrative burden from education institutions to access funds with contingency funds addressing LE that promote education concepts and minimum standards for LE. National programs for development of education are proposing diverse and low coordinated approaches that are not able to demonstrate consistent approach contributing to learning. The system of national programs could develop info-coordinated and needs-oriented approach based on specific data of LE profiles and needs of education institutions.

- **Establishment of a specific Fund for Good Ideas for education to allow quick access to funding for developmental needs related to education might play a role of activator for counterparts and processes in education.** Learning environment could be one of the elements of together with needs and innovations in education. The establishment of such "fund" could combine national funds, EU investments crowd funds and donors and function in the scope of a trust fund flexibly addressing education. In the context of learning environment such fund could promote contemporary learning environments with dissemination and promotion activities, such as architectural competitions, publications, scholarships, experiments in education, special event addressing key stakeholders.

General recommendations for Operational Programme and programming

- **Following the recommendation of the new ESF+ regulation on creating equal access to all level of education, specifically for vulnerable groups and supporting learning mobility, it is important MOES to consider including learning environment as a part of the project design components together with new curricula, learning courses, which are introduced for ECEC, general education and VET sectors**. International studies show that pupils' satisfaction with school environment and better psychological climate with lower level of bullying might impact learning outcomes of the children, especially from lower socio-economic groups.[119] Therefore, soft measures on upgrade of learning environments could be included in the project design (participatory exercises to develop new learning environments layouts with the different groups of children, evaluation of the needs of users to create equal access to the learning

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environments and education process, upgrade of furniture and equipment in connection with the project objectives, introduction of teacher practices, which envisage change of learning environments). Following the lack of investments in the conceptual development of learning environments (aligned with education concept) in Bulgaria, these activities will help to develop LE as a key component to support learning.

- **Learning oriented guideline, which serves as an addition to existing formal standards on infrastructure will be needed to facilitate management approaches and policy needs.** The Government of Bulgaria is planning to separate the management of capital investments (Regional Development Fund) from education investments (OP and National funds for education) and this approach might stimulate the formal application of existing infrastructure standards that are not addressing a leading learning concept or promoting specific learning oriented goals. MOES is advised to lead and influence that process by developing a specific guidance on learning-oriented requirements for investments and develop a package of information and training materials for administrative project managers and the system overall to inform and guide the process.

- **The future national and EU investments should clearly reflect the conceptual approach to learning environment for each education sub-sector - ECEC, general education and VET in the framework of the funding of each sub-sector.** Currently, the draft OP for education mentions different aspects of preschool/school learning environments: for example, it mentions social environment (inclusion, prevention of bullying), specialized supportive educational environment (inclusion), digital environment, cloud environment (ICT), different learning environments for skills competence (VET), innovative learning environments (preschool/general education), real work environment (VET), multilingual environment (inclusion). However, OP did not identify general concept of DLE, as well as key elements of above-mentioned environments. The OP could specify the structural elements of these environments to be a subject of improvement (e.g. teacher's training on LE assessment and usage, learning aids, LE furniture upgrade). Additionally, the OP could introduce a special sub-section on learning environments improvement for each priority area.

- **The consequences of COVID-19 pandemic changed the way LE are used across the globe, therefore the priorities under the OP might reflect this focus when addressing ESF+ policy priorities, especially in terms of digital skills development.** The restrictions introduced in the school and temporary lockdowns, as well as introduction of distance learning might introduce significant changes to the use of existing learning environments. The MOES might consider addressing these issues through OP actions (teachers' training of distance mode pedagogical practices, development of virtual learning environments), also because the COVID-19 scope was addressed in the EC review.

- **Development of a possible connection between the Green Deal policy and the concept of Green schools, introduced in the Education 2030 Strategy.** The EU will finance significant

rehabilitation of schools in the framework of Green Deal to ensure that physical learning environments (school buildings) are more energy efficient. In terms of the ESF+, the future projects might target soft measures of learning environments development: teacher trainings on development of green educational environments, development of curricula and assessment of existing learning environments by users. Additionally, the OECD teacher questionnaire on key elements of LE (light, temperature, comfort) might inform this thematic area and collect necessary data for OP.

- Bulgaria will have to improve and strengthen data collection to address its development strategy, plan for OECD membership and the critical need for the system to develop effective investments. More specific data on DLE and related to key EU policy priorities are needed.

- Bulgaria needs a specific strategy to address different profiles of DLE across the system. ESF investments that are directly targeted to learning and competences need to be integrated with learning focused DLE efforts that promote education concepts for LE. 1257 institutions have not reported investment in DLE during 2010-2020 representing close to half of the institutions in 2020. Majority of kindergartens haven't reported DLE investments alerting for both the need to strengthen the knowledge instruments and to develop focused programs to DLE. Details on all DLE profiles and belonging institution are available in the dynamic tableau file.

Findings	*Recommendations*
National Policies on Learning Environments	
1. The last 4 years have marked a significant increase in the investments in the LE. The funding for the direct LE has doubled, leading to more institutions receiving support to upgrade and develop their LE. The 2020 thematic scope of the NPDE modules that address the LE represents a mix of three type of activities: (i) general LE investments in schools and pre-schools; (ii) thematic modules on specific topics related to the curriculum (experimental work in natural sciences, reading, road safety, STEM in schools) and (iii) funds for specialized equipment in VET, ICT, SEN and physical safety. There is a significant increase in the funds supporting the development of the learning environment in accordance with the implementation of the new curriculum introduced by the PSEA.	The increase in funding needs to be paired with continuing investments in the direct LE aimed at reaching more beneficiaries, investing in clear, consistent and predictable instruments, serving a comprehensive plan for development of learning environment in all sectors of education, starting from pre-schools and continuing to primary, secondary education and VET.

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2. On the while, Bulgaria does not have a vision with respect to the direct LE concept targeted by the education system despite the diversity of programs and investments implemented by a variety of stakeholders responsible for LE management, maintenance, investment and development. The LE investments represent the cumulative outcome of various programs perusing different goals which do not necessarily complement each order to achieve a cumulative effect.	A comprehensive planning is needed to respond to the LE needs by integrating the national education priorities. The plan is expected to (i) outline a vision for direct learning environments; (ii) establish basic standards for direct learning environments that build on and develop the existing standards focused on the elements of the physical environment and the public health standards of care and health conditions; (iii) set short-term, medium-term and long-term targets for the system and (iv) outline the priorities of the evidence-based approach to managing the LE developments.
3.The national planning of investments in the LE is organized on an annual basis, without following long-term or medium-term specific goals and without being informed by the needs of individual schools. The program planning approach is entirely top-down, as it sets goals and priorities at the national level, which are translated into policies and investment instruments (with the NPDE planning), without necessarily taking into account the needs of the specific institutions in the system.	1. Strategic investment planning should be adopted in the medium term (5-10 years); specific priorities should be set and of investments should be accumulated to achieve these priorities in all educational sectors (pre-school, general school, VET). In this way, predictability, sustainability and the cumulative effect of investments will be achieved, as the resources will be distributed fairly among all institutions in the system and will be able to reach more children. Key complex priorities with respect to the development of the LE that contribute to achieving the education goals should be identified. The planning of specific initiatives should take into account these key priorities, creating the conditions for integrating investments in all directions: 1) upgrading the learning environment; 2) developing and modernizing pedagogical practices; 3) updating learning content; 4) increasing the effectiveness of the management practices in the educational institutions; 5) increasing the integration of technology in education.
4. There is an overlap of thematic scope and targets between the programs in the NPDE mix in 2020 thus providing space for better conceptual design and contributing to the LE approaches. The financing of the same activities through different programs in setting different criteria and conditions for this funding puts educational institutions in an unequal position and creates obstacles in achieving the unilateral goals.	MoES could improve its LE targeting strategy through the NPDEs, OPs and other funding instruments by setting certain LE profiles of schools. The proper identification of specific groups of schools and the use of objective criteria could solve many current problems, such as the limited access to funding for smaller schools. Categorizing schools for the purpose of prioritizing investments according to different types of schools could also contribute to investment policy planning in the medium term. On the basis of MoES LE data on renovation investments for 2020 five key groups of institutions have been proposed by the WB team by type

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	of LE to be used for integrating and managing DLE investments under the MoES funding instruments.
5. Investments in the LE do not contribute to the development of innovations and search for non-standard solutions to the problems that the system faces. The educational environment is not considered to be an element that contributes to the introduction of innovative approaches in education.	(i) to clearly define the concept of innovation by taking into account all environmental factors that influence the process of creating innovation, including the renewal of the direct educational environment; (ii) to include indicators to monitor the innovations introduced as a result of the investments in the direct educational environment.
6. Different educational stakeholders (local authorities and private investment organizations) have developed their capacity in the development of innovative educational practices through investment in the LE and have the potential to be used as a model for implementing successful policies at the governmental level and to bring know-how for realizing investments in the learning environment, especially when they are supported by evidence of the achieved results.	Lessons learned from the investments in the LE should be explored, adapted and, if appropriate, applied in a national context, as they have proven their effectiveness (including through external evaluations - in the case of the America for Bulgaria Foundation). in the Bulgarian context. Effectiveness assessment is needed across programs and investments.
7. There is a lack of targeted monitoring to examine the effect of investments and to inform future decisions with respect to the policy mix and policy interventions. The reporting of funding programs has been organized to serve the administrative needs, monitoring mainly quantitative indicators without setting and measuring outcomes. Activities have been reported and monitored widely into the system, leaving the effect of the measures taken with respect to increasing the quality of education for students and improving their educational outcomes outside the reporting and monitoring of programs.	There is a need of a continuous impact assessment of the NPDEs, aimed at evaluating the effect of the programs on the educational institutions, teachers' practices and students' well-being with regard to the LE. Such an assessment should be done in each sector – ECD, general education and VET, in order to inform the design of future programs and could be funded from the national budget. Additionally, adopting an approach for measuring the results of each intervention implemented through the policies at national level should be considered in the future. Setting quality indicators is a key element of tracking the results of investments. The reporting of activities and invested resources will lead to

	qualitative changes and results (outcomes and outputs). In the planning of investment projects, adequate, realistic and measurable goals should be set. These goals should be pursued not for the purpose of administrative reporting but for the purpose of informing future decisions and taking actions for adapting and changing investments in order to achieve the set goals and match the dynamic changes in society and economy.
Early childhood development	
8. Preschool institutions represent approximately half of the educational institutions in the country, fewer programs and disproportionally less funding have been addressed directly to pre-school education under both the NPDEs and the OPSESG which leaves ECEC outside of the focus of the investments in the LE. Pre-schools have not been addressed by the variation of topics that interrelate within the current LE investment opportunities, thus leaving gaps in the national policy with respect to providing an appropriate LE from an early age.	Early childhood development and education is one of the priorities of the educational system. Therefore investments in the LE in kindergartens should not remain dependent on the economic opportunities at the local level and should be supported by targeted investments at the national level. Investing in the development of the LE for children in kindergartens would increase the capacity of these educational institutions to provide quality education and therefore would support the achievement of the goals of the educational system. Kindergartens and other ECEC providers should be added to the list of eligible beneficiaries under all NPDEs and the OPSESG projects that provide funding for the LE in order to support early childhood care and education. The planning of programs and measures aimed at nurseries as equal to pre-schools should be considered a priority need. Other ECEC provisions are to be considered as well. In this way, the educational institutions working with children from an early age will have the opportunity to gain access to funding, which for many of them is the only possible source of funding for the development of the LE.
General education	
9. The approach to addressing the general LE needs should be reconsidered to become more flexible and more efficient from the point of view the LE policy effort. The thematic scope with respect to schools follows the key policy trends (VET, STEM, ICT) limiting potential beneficiaries by a number of administrative	The policy mix should organize investments in more global programs and projects that stimulate innovation (in terms of searching for solutions of pressing problems) as well as the development of all aspects of the educational environment, which would contribute to: 1) formulating goals and organizing activities aimed at the

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requirements (according to the number of students; the profile of the studied disciplines, the educational level etc.) resulting in unequal access to funding for the beneficiaries. There is also no uniform approach to the procedure for allocating funds: some of the funds are distributed so that the goals are achieved for all educational institutions, while others are distributed on a competitive basis.	educational process and the educational outcomes of students; 2) reaching the optimal use of resources by accumulating the effect of a number of purposefully integrated measures and activities to achieve the respective goals; (3) contextualizing projects through the ability of educational institutions to work in the direction of achieving their vision and strategy in a more comprehensive and holistic way. In order to achieve the above mentioned objectives, MoES should: 1) ensure longitudinal funds for thematic areas and address pure infrastructure needs by a specific fund; 2) open the procedures to a wider range of potential beneficiaries in order to reduce the eligibility restrictions for certain types of educational institutions, such as pre-schools; 3) define criteria that provide access to funding for both small and large schools, as well as private educational institutions based on their specific needs.
Vocational Education and training	
10. Vocational education is a part of the priority areas for the development of education, which can be found in the structure of the national investment policy mix that provides access to funding under almost all programs aimed at developing the learning environment.	The focus of investments in vocational education, observed in the period 2016-2020, should be updated on the basis of the targeted investments. MoES needs to develop a sound monitoring system to assess the outcomes of interventions. Consolidation of funds and targeting is needed to manage policy efforts and VET change. MOES should consider the development of a special contingency fund to address equipment needs and to replace the annual programs by a strategic fund that address equipment needs. This process might be informed by VET reforms in Latvia that pursued planned investments in VET infrastructure and DLE renovation, packed with consolidation of VET provision and VET practical work-oriented planning.
OP SESG	

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11.The ESF projects in Bulgaria have promoted an approach that links the educational processes to investments in essential environments , and that has slowly influenced national funding by a clear attempt to adopt a holistic vision, address primary policy goals, and focus on learning.	The integration of investments in the LE with investments that support the application of the curriculum should be encouraged as well as the efforts to use ESF funding to support key system goals such as improving teaching practices and improving students' outcomes. All these aspects should be strengthened, extended and upgraded to allow the proper measuring of effects and management. The investments made to address the DLE needs should follow specific national priorities on the LE (above) and adopt LE profiles on education institution level (above) and plan investments accordingly The scope of beneficiaries , especially with respect to pre-school investments needs to cover nurseries and private providers in order to address the policy needs and goals.

Annex 2. Questionnaire developed by MOES team to access direct learning environments in schools

Споразумение за предоставяне на консултантски услуги за преглед на публичните разходи в областта на науката, технологиите и иновациите и за подкрепа при изграждането на подход, основан на доказателства за Националната стратегическа рамка за развитие на образованието 2030

СТЪЛБ 2: Подкрепа за изграждането на подход, основан на доказателства за Националната стратегическа рамка за развитие на образованието 2030

Преглед на директната образователна среда в предучилищните институции и училищата, включително и в училищата, предлагащи професионално образование и обучение

Образователни институции: ВЪПРОСНИК ЗА ДИРЕКТОРИ

Цел на въпросника

Настоящият въпросник е разработен в допълнение към текущото събиране на данни, което МОН извършва по отношение на инвестициите в образователна среда (ОС) и основните ремонти, направени в образователните институции. Въпросникът е насочен към всички директори на предучилищни институции, училища и професионални училища в България. Резултатите ще бъдат използвани за преглед и анализ на съществуващата директна образователна среда в страната. Въпросникът:

- съдържа избрани въпроси, които се базират на School User Survey[120] на ОИСР, насочен към ръководителите на училищата, който е инструмент за самооценка, създаден от Платформата за оценка на образователната среда на ОИСР (OECD Learning Environments Evaluation Platform - LEEP)[121];
- отразява и събира информация, свързана с процеса на планиране, организиран от МОН, по отношение на Стратегическата рамка за развитие на образованието в България до 2030 г.;
- отразява първия проект на бъдещата оперативна програма за образованието 2021-2027, съфинансираната от ЕСФ.

[120] http://www.oecd.org/education/effective-learning-environments/OECD-School-User-Survey.pdf
[121] http://www.oecd.org/education/effective-learning-environments/

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Обхват на въпросника

Образователната среда се отнася към физическото пространството и контекста, където се провежда обучение и включва физическата и виртуална среда на общуване, материалите за преподаване, които следват педагогическия подход.

Това изследване събира информация за използването на *директната образователна среда* - физическите аспекти на средата, в която се провеждат ученето и взаимодействието с децата и учениците.

Инструкции за попълване на въпросника

Проучването се състои от 12 административни и 16 специализирани въпроса и попълването му отнема около 30-40 минути. В края на въпросника има секция, в която участниците са поканени да направят и изпратят снимки от стандартна образователна среда в образователната институция, която представляват.

Моля, прочетете внимателно всеки въпрос и отговорете възможно най-точно. Повечето въпроси включват избор на отговор и маркиране на съответното поле. В някои въпроси имате възможност да добавите коментар или да посочите алтернативен отговор. Информацията ще бъде използвана при планирането на национални политики за инвестициите в образователна среда и за развитието на образованието в България.

Благодарим Ви за участието в това проучване!

При въпроси и коментари моля не се колебайте да се обърнете за контакт към:

Десислава Кузнецова, Световна банка: dkuznetsova@worldbank.org

Елена Витанова, МОН: e.vitanova@mon.bg

РАЗДЕЛ 1: АДМИНИСТРАТИВНИ ДАННИ ЗА УЧИЛИЩЕТО/ПРЕДУЧИЛИЩНОТО ЗАВЕДЕНИЕ

1.1. Моля въведете кода на Вашето училище/ предучилищна/образователна институция:

_____

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1.2 Моля посочете дали Вашето училище/ предучилищна/образователна институция е:

(моля отбележете само ако се отнася до Вас)

Частно/а (различна от държавна или общинска собственост) □ 1
Иновативно/а (по силата на програмите на МОН за иновативни образователни институции) □ 2
Средищно/а □ 3
Защитено/а □ 4
Предлага професионално обучение □ 5
Никое по изброените □ 6

1.3 Приблизително какъв процент от общото финансиране за последната учебна година е от следните източници?

(Моля, посочете цифра за всеки ред. Посочете 0 (нула) в случай, че не получавате финансиране от съответния източник.)

		%
а)	Средства по национални, европейски и други програми за подкрепа на развитие на образованието	_____
б)	Правителствени средства/бюджети (включва средства от местно, и национално ниво)	_____
в)	Учебни такси и такси, заплащани от родителите	_____
г)	Средства от дарители, спонсорства	_____
д)	Такси на ученици	_____
е)	Друго	_____
	Общо:	100%

1.4 Брой на децата в предучилищна възраст: какъв е общият брой на децата, записани във всяка възрастова група?

0-3 години _____ Boys _____ Girls _____
4-5 години _____ Boys Boys Girls Girls _____
5-6 години _____
6-7 години _____
Общ брой деца с физически увреждания: _____

1.5 Брой ученици: какъв е общият брой на учениците, записани във всеки клас?

1. клас _____
2. клас _____
3. клас _____

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4. клас _____
5. клас _____
6. клас _____
7. клас _____
8. клас _____
9. клас _____
10. клас _____
11. клас _____
12. клас _____

Общ брой ученици с физически увреждания: _____

1.6 Кое от следните определения отговаря най-добре на описанието на населеното място, в което се намира Вашето училище/ предучилищно заведение?

(моля отбележете само един отговор)

а) Село, малко населено място или селски район (с население под 3 000 души) ☐ 1

б) Малко градче (с население 3 000 до 15 000 души) ☐ 2

в) Малък град (с население 15 000 до 100 000 души) ☐ 3

г) Град (с население 100 000 до 1 000 000 души) ☐ 4

д) Голям град (с население над 1 000 000 души) ☐ 5

1.7 На колко смени работи Вашето училище/ предучилищно заведение?

Една смяна ☐

Две смени ☐

Друго (моля посочете):_____

1.8 Споделяте ли сградата с друга образователна институция?

Да (моля посочете типа образователната институция)

_____

Не ☐

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<u>За директори на детски градини:</u> Моля отговорете на въпрос 1.9

1.9. Колко помещения за работа с деца/занимални:

*(посочете точен брой)***:**

1.9.1 има в сградите на Вашата образователна институция? _____

1.9.2 не се използват за учебни занятия/ взаимодействие с учениците/ децата? _____

1.9.3. са изцяло ремонтирани (ремонт на интериора, мебели и технологични решения) през последните 5 години? _____

1.9.4. са частично ремонтирани (всяка дейност, която е внесла подобрения по интериора) през последните 5 години? _____

1.9.5. Колко деца има обикновено в една класна стая? _____

1.9.6. Смятате ли, че в класните стаи има твърде много деца? да/не

<u>За директори на училища:</u> Моля отговорете на въпроси 1.10, 1.11 и 1.12

1.10. Колко класни стаи (помещения):

*(посочете точен брой)***:**

1.10.1 има в сградите на Вашата образователна институция? _____

1.10.2 не се използват за учебни занятия / взаимодействие с учениците / децата? _____

1.10.3. са изцяло ремонтирани (ремонт на интериора, мебели и технологични решения) през последните 5 години? _____

1.10.4. са частично ремонтирани (всяка дейност, която е внесла подобрения по интериора) през последните 5 години? _____

1.10.5. Колко ученика има обикновено в една класна стая? _____

1.10.6. Смятате ли, че в класните стаи има твърде много ученици? да/не

1.11. Колко стаи за предучилищни групи:

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*(посочете точен брой.)***:**

1.11.1 се ползват във Вашата образователна институция? _____

1.11.2. са изцяло ремонтирани (ремонт на интериора, мебели и технологични решения) през последните 5 години? _____

1.11.3 са частично ремонтирани (всяка дейност, която е внесла подобрения по интериора) през последните 5 години? _____

1.11.4. Колко деца има обикновено в една класна стая? _____

1.11.5. Смятате ли, че в класните стаи има твърде много деца? да/не

1.12. Предучилищните групи използват (посочете само един отговор):

1.12.1. самостоятелен вход, който не се използва от другите ученици;

1.12.2. общ вход само с учениците от начален етап

1.12.3. общ вход с други ученици

1.12.4. Друго (моля посочете)

<Край на административния модул. Моля преминете на следващата страница.>

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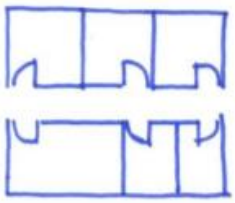
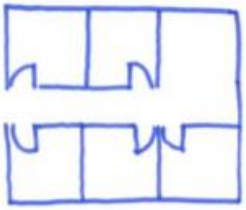
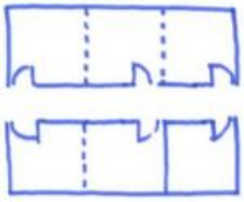
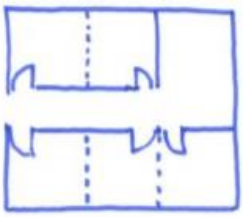
РАЗДЕЛ 2: ОБРАЗОВАТЕЛНА СРЕДА

Следващите въпроси са насочени към директорите на предучилищни образователни институции, училища и други образователни институции.

2.1 От следните шест типа разпределение на пространството, моля посочете по колко броя класни стаи/помещения за взаимодействие/игра има във Вашата образователна институция:
(Моля посочете точен брой за всеки от изброените видове по-долу)

а) Класни стаи/помещения, разпределени около коридор  Брой:_____	б) Класни стаи/занимални с пряк достъп до пространство извън класната стая (breakout spaces); това помещение е лесно достъпно от децата/учениците или преподавателите по всяко време и се използва за различни обучителни или общи дейности. Това пространство няма предефинирана функция)  Брой:_____
в) Стаи/помещения, с подвижни стени  Брой:_____	г) Стаи/помещения, с подвижни стени и с пространство, в което учениците да могат да работят (breakout spaces)  Брой:_____

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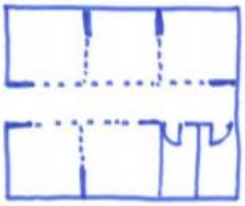
д) Отворен план с възможности за обособяване на работни зони/зони за игра  Брой:_____	е) Отворен план (помещение или сграда, които има малко или нямат стени и не са разделени на по-малки пространства)  Брой:_____

Източник: OECD, 2019 г.
http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/EDPC/GNEELE(2018)3/REV1&docLanguage=En

2.2 С колко от посочените помещения разполага Вашето училище/предучилищна/ образователна институция?

(моля посочете точен брой за всяко помещение, което е налично)

а) Място за почивка или работно пространство в коридорите (извън класната стая/занималнята) _____

б) Библиотека _____

в) Зала/аудитория _____

г) Столова _____

д) Научна лаборатория/ пространство _____

е) STEM класна стая/кабинет/ пространство _____

ж) Помещение/студио за изобразително изкуство, музика или дизайн _____

з) Кухня/помещение за хранителни технологии _____

и) Техническа работилница/ пространство (за работа с дърво, метал, пластмаса, роботика, др.) _____

й) Физкултурен салон/спортна зала _____

к) Спортна площадка _____

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л) Ресурсен кабинет

м) Кабинет за психолог и/или логопед

н) Общежитие

о) Спални помещения (за предучилищни групи)

п) Басейн

р) Друго помещение/я? Моля, опишете го накратко:

2.3 Има ли изградена следната инфраструктура за ученици/деца с физически увреждания:
(Моля отбележете всяко от изброените)

1. Покрити рампи □
2. Санитарни възли □
3. Асансьор □
4. Други платформени съоръжения □
5. Друго

_____

6. **Нито едно от посочените** □

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2.4 За <u>целите на учебните занятия</u>, съобразно програмата, кои от следните помещения във Вашето училище/предучилищна/ образователна институция се използват обикновено?
(Моля отбележете за всяко, което е налично)

		Никога	Веднъж седмично	2 до 4 пъти седмично	Всеки ден
а)	Традиционна класна стая/занималня без достъп до място извън класната стая/занималнята, в което учениците да могат да работят (breakout spaces)	□1	□2	□3	□4
б)	Традиционна класна стая/занималня с пряк достъп до места извън класната стая/занималнята, в които учениците да могат да работят, например за работа по групи, проектна или индивидуална работа	□1	□2	□3	□4
в)	Място за съвместно преподаване (2 или повече учители), в което учителите и учениците споделят различни свързани учебни пространства, например за работа по групи, проектна или индивидуална работа	□1	□2	□3	□4
г)	Място в коридор извън класната стая / занималнята	□1	□2	□3	□4
д)	Библиотека	□1	□2	□3	□4
е)	Зала / аудитория	□1	□2	□3	□4
ж)	Столова (извън традиционното използване с цел хранене)	□1	□2	□3	□4
з)	Научна лаборатория/кабинет	□1	□2	□3	□4
и)	STEM класна стая/кабинет	□1	□2	□3	□4
й)	Помещение/студио за изобразително изкуство, музика или дизайн	□1	□2	□3	□4
к)	Кухня/помещение за хранителни технологии	□1□1	□2	□3	□4
л)	Техническа работилница (за работа с дърво, метал, пластмаса, роботика)	□1	□2	□3	□4
м)	Физкултурен салон/спортна зала	□1	□2	□3	□4

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н)	Спортна площадка	□1	□2	□3	□4
о)	Ресурсен кабинет	□1	□2	□3	□4
п)	Кабинет за психолог и/или логопед	□1	□2	□3	□4
р)	Общежитие	□1	□2	□3	□4
с)	Спални помещения (за предучилищни групи)	□1	□2	□3	□4
т)	Басейн	□1	□2	□3	□4
у)	Друго помещение? Моля, опишете го накратко:	□1	□2	□3	□4

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2.5 Само за училищни възрастови групи: извън учебните занятия, провеждани съобразно програмата, кое от изброените места във Вашето училище /предучилищна/ образователна институция се използват от преподавателския екип или за самостоятелна работа, или за работа с другите деца/ученици?

		Никога	Веднъж седмично	2 до 4 пъти седмично	Всеки ден
а)	Традиционна класна стая/занималня без достъп до място извън класната стая/занималнята, в което учениците да могат да работят (breakout spaces)	☐1	☐2	☐3	☐4
б)	Традиционна класна стая/занималня с пряк достъп до места извън класната стая/занималнята, в които учениците да могат да работят, например за работа по групи, проектна или индивидуална работа	☐1	☐2	☐3	☐4
в)	Място за съвместно преподаване (2 или повече учители), в което учителите и учениците споделят различни свързани учебни пространства, например за работа по групи, проектна или индивидуална работа	☐1	☐2	☐3	☐4
г)	Място в коридор извън класната стая / занималнята	☐1	☐2	☐3	☐4
д)	Библиотека	☐1	☐2	☐3	☐4
е)	Зала / аудитория	☐1	☐2	☐3	☐4
ж)	Столова (извън традиционното използване с цел хранене)	☐1	☐2	☐3	☐4
з)	Научна лаборатория/кабинет	☐1	☐2	☐3	☐4
и)	STEM класна стая/кабинет	☐1	☐2	☐3	☐4
й)	Помещение/студио за изобразително изкуство, музика или дизайн	☐1	☐2	☐3	☐4
к)	Кухня/помещение за хранителни технологии	☐1	☐2	☐3	☐4
л)	Техническа работилница (за работа с дърво, метал, пластмаса, роботика)	☐1	☐2	☐3	☐4

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м)	Физкултурен салон/спортна зала	□1	□2	□3	□4
н)	Спортна площадка	□1	□2	□3	□4
о)	Ресурсен кабинет	□1	□2	□3	□4
п)	Кабинет за психолог и/или логопед	□1	□2	□3	□4
р)	Общежитие	□1	□2	□3	□4
с)	Спални помещения (за предучилищни групи)	□1	□2	□3	□4
т)	Басейн	□1	□2	□3	□4
у)	Друго помещение? Моля, опишете го накратко:	□1	□2	□3	□4

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2.6 За всяко от изброените, което е налично, моля оценете удовлетвореността си от състоянието на директната образователна среда по скалата

(1-Изобщо не съм доволен/доволна е най-ниската оценка, а 5-Доволен/доволна съм е най-високата)

До каква степен сте доволни от:	Изобщо не съм доволен/доволна				Доволен/доволна съм
1.Стандартните учебни пространства (класни стаи/занималня)	☐1	☐2	☐3	☐4	☐5
2.Коридорите и фоайетата	☐1	☐2	☐3	☐4	☐5
3.Библиотека	☐1	☐2	☐3	☐4	☐5
4. Зала/аудитория	☐1	☐2	☐3	☐4	☐5
5. Столова	☐1	☐2	☐3	☐4	☐5
6. Научна лаборатория/кабинет /помещение	☐1	☐2	☐3	☐4	☐5
7. STEM кабинет /помещение	☐1	☐2	☐3	☐4	☐5
8. Помещение/студио за изобразително изкуство, музика или дизайн	☐1	☐2	☐3	☐4	☐5
9. Кухня/помещение за хранителни технологии	☐1	☐2	☐3	☐4	☐5
10. Техническа работилница /помещение (за работа с дърво, метал, пластмаса, роботика)	☐1	☐2	☐3	☐4	☐5

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11. Физкултурен салон/спортна зала	☐1	☐2	☐3	☐4	☐5
12. Спортна площадка	☐1	☐2	☐3	☐4	☐5
13. Ресурсен кабинет	☐1	☐2	☐3	☐4	☐5
14. Кабинет за психолог и/или логопед	☐1	☐2	☐3	☐4	☐5
15. Общежитие	☐1	☐2	☐3	☐4	☐5
16. Спални помещения (за предучилищни групи)	☐1	☐2	☐3	☐4	☐5
17. Басейн	☐1	☐2	☐3	☐4	☐5
18. Лабораториите/кабинетите за професионална подготовка/обучение	☐1	☐2	☐3	☐4	☐5
19. Тоалетните и другите санитарни съоръжения	☐1	☐2	☐3	☐4	☐5
20. Съоръженията/ инфраструктура за деца/ученици/хора с увреждания	☐1	☐2	☐3	☐4	☐5
21. Друго – моля посочете:	☐1	☐2	☐3	☐4	☐5

2.7 По отношение на пространството, в което учителите преподават, според Вас колко често се използват следните подходи за разпределение на пространството, демонстрирани по-долу?

(Съобразно представените типологии, моля отбележете за всеки ред по-долу) Диаграмите представят 4 типа на взаимодействие/преподаване, който биха могли да се използват за работа с учениците/децата

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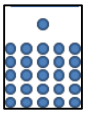


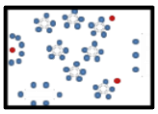
Тип 1 - Аудитория:

Подкрепя предаване на информация, указания на цялата група.

Тип 2 - Група: Подкрепя подходи, при които учениците взаимодействат и работят в малки групи, споделят идеи и си помагат

Група 3 - Индивид:

Подкрепя подходи за индивидуална работа за писане, четене, изследване на тема, мислене и рефлексия



Група 4 – Групово преподаване:

Подкрепя взаимодействието между двама или повее учители, които комбинират индивидуалните си предмети в един курс и работят заедно, като екип, с група ученици като споделят едно и също пространство (може да бъде група с деца/ученици от различни възрасти).

		Никога	1 до 3 на месец	Веднъж на седмица	2 до 4 пъти на седмица	Всеки ден
a)	Тип 1 - Подкрепя предаване на информация, указания на цялата група	☐1	☐2	☐3	☐4	☐5
b)	Тип 2 - Подкрепя подходи, при които учениците взаимодействат и работят в малки групи, споделят идеи и си помагат	☐1	☐2	☐3	☐4	☐5
c)	Тип 3 - Подкрепя подходи за индивидуална работа за писане, четене, изследване на тема, мислене и рефлексия	☐1	☐2	☐3	☐4	☐5
d)	Тип 4 - Подкрепя взаимодействието межу двама или повее учители, които комбинират индивидуалните си предмети в един курс и работят заедно, като екип, с група ученици като споделят едно и също пространство (може да бъде група с деца/ученици от различни възрасти	☐1	☐2	☐3	☐4	☐5
e)	Друго	☐1	☐2	☐3	☐4	☐5

Ако прилагате друг подход на организация на пространството, моля представете накратко тук:_____

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2.8 До каква степен сте съгласни със следните твърдения за предучилищното/училищното ръководство и образователната среда?
(*моля отбележете един отговор от всеки ред*)

	Напълно съм съгласен	Съгласен /а съм	Не съм съгласен /а	Изобщо не съм съгласен/
а) Ръководството и учителите имат еднакво виждане по отношение на преподаването и за това по какъв начин да използват най-пълноценно образователната среда	☐ 1	☐ 2	☐ 3	☐ 4
б) Ръководството насърчава учителите да експериментират с различни начини за използване на съществуващата	☐ 1	☐ 2	☐ 3	☐ 4
в) Начинът, по който са организирани/подредени учебните помещения подкрепя сътрудничеството	☐ 1	☐ 2	☐ 3	☐ 4
г) Начинът, по който са организирани/подредени учебните помещения подкрепя прилагането на	☐ 1	☐ 2	☐ 3	☐ 4
д) Сградите и образователните пространства отговарят на предпочитаната от мен преподавателска практика	☐ 1	☐ 2	☐ 3	☐ 4
е) Образователната институция организира учебното време с цел ефективно използване на учебните помещения (изготвяне на	☐ 1	☐ 2	☐ 3	☐ 4
ж) Имам отделено време за планиране заедно с учителите	☐ 1	☐ 2	☐ 3	☐ 4
з) На учителите се предоставят време и съвети как да планират най-добрата употреба на учебните помещения в училището	☐ 1	☐ 2	☐ 3	☐ 4

2.9 До каква степен считате, че физическата среда и оборудването във Вашата образователна институ оказват влияние върху следното:
(*моля отбележете един отговор от всеки ред*)

	Изобщо не	Много малко	До известна степен	го
а) Склонността на учителите да останат на работа в това училище	☐ 1	☐ 2	☐ 3	☐
б) Улесняват привличането на нови учители	☐ 1	☐ 2	☐ 3	☐

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в) Привличат родителите, които търсят в кое училище да запишат децата си ☐ 1 ☐ 2 ☐ 3 ☐

г) Повишават удовлетвореността и мотивацията на учениците да учат ☐ 1 ☐ 2 ☐ 3 ☐

2.10 Обикновено как са разпределени занималните/класните стаи/образователните помещения?

а) Повечето учители използват една и съща стая/учебно пространство/помещение по всички предмети ☐ 1

б) Повечето учители използват специализирани стаи/учебно пространство/помещение по определен предмет поне за един срок (например кабинет А по английски език, кабинет С по история – подготвени за нуждите на определен предмет) ☐ 2

в) Повечето учители използват много различни класни стаи/учебни пространства/помещения, за предметите, по които преподават и/или класове ☐ 3

г) Повечето учители преподават заедно (преподаване в екип) и споделят помещения, които са проектирани за по-големи групи от паралелките на един и същи клас[122] ☐ 4

д) Повечето учители преподават заедно (преподаване в екип) и споделят помещения, които са проектирани за по-големи групи от деца/ученици/класове от смесени випуски[123] ☐ 5

2.11 Колко класни стаи/занимални/учебни помещения са оборудвани със следното (или имат лесен достъп до следното)?

а) Интерактивен AV дисплей (интерактивна бяла дъска или ____

б) Безжичен интернет ____

в) Възможност за прожектиране на звук и картина на учениците в клас (например проектор или голям телевизор с аудио система) ____

г) Преносими електронни устройства, собственост на образователната институция (които се съхраняват в помещението) ____

д) Настолни компютри ____

е) Таблети ____

ж) Места за зареждане (на мобилни устройства) ____

[122] Група или паралелка от ученици от една училищна година, например от 7. клас

[123] Смесена група от ученици от различни училищни години, например от 6 и 7 клас

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з) Кабелен интернет ____

и) Няма достъп до интернет ____

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2.12 Разрешено ли е на учениците да носят собствено електронно устройство за целите на обучението в образователната институция?
(Отбележете всяка група/клас, за която/който има такава възможност)

Предучилищна / 4-5 годишни	□1	Предучилищна / 5-6 годишни	□2	Предучилищна / 6-7 годишни	
1. клас	□ 1	2. клас	□ 2	3. клас	□ 3
4. клас	□ 4	5. клас	□ 5	6. клас	□ 6
7. клас	□ 7	8. клас	□ 8	9. клас	□ 9
10. клас	□ 10	11. клас	□ 11	12. клас	□ 12

2.13. МОН стимулира училищата и детските градини да развиват иновативни практики. От какви ресурси, по отношение само на директната образователна среда, имате нужда, за да развиете иновативна образователна среда в институцията, която ръководите:

(Моля отбележете всяко вярно твърдение или допълнете)

1. Адаптивна мебелировка □
2. Основно IT оборудване □
3. Специализирано IT оборудване □
4. Софтуерни решения □
5. Пространства за съвместна работа/преподаване за учители □
6. Пространства за съвместна работа за ученици/деца □
7. Общ ремонт на интериора □
8. Базово лабораторно оборудване □
9. Специализирано лабораторно оборудване □
10. Пространства за стимулиране на индивидуалната работа/изследване/учене □
11. Основни информационни ресурси и източници на знание – електронни и традиционни □

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12. Специализирани информационни ресурси и източници на знание – електронни и традиционни □
13. Общ ремонт и подобрения на сградите □
14. Друго _____

2.14 МОН планира да насърчи разработването и прилагането на концепцията за Зелена образователна институция. Според Вас, кои от изброените тематични области отговарят на концепцията за Зелена образователна институция?
(Отбележете всички елементи, които считате за релевантни)

1.	Енергийна ефективност и поведение, насочено към отговорно потребление на енергия	□ **ДА**	□ **НЕ**
2.	Опазване и ефективно потребление на вода	□ **ДА**	□ **НЕ**
3.	Опазване и увеличаване на зелените пространства	□ **ДА**	□ **НЕ**
4.	Ефективно управление на отпадъците	□ **ДА**	□ **НЕ**
5.	Опазване хабитата на местните видове		
6.	Устойчивост и безопасност на околната среда	□ **ДА**	□ **НЕ**
7.	Насърчаване на алтернативната мобилност (без въглероден отпечатък)	□ **ДА**	□ **НЕ**
8.	Създаване на зелени партньорства с местни организации, насърчаващи устойчиво развитие	□ **ДА** □ **ДА**	□ **НЕ** □ **НЕ**
9.	Учебна програма, насочен към опазване на околната среда	□ **ДА**	□ **НЕ**
10.	Гъвкавост между дистанционно и традиционно образование за адресиране на екстремни ефекти на промяната на климата (топли вълни, наводнения, пожари, екстремни студове)	□ **ДА**	□ **НЕ**
11.	Гъвкавост между периодите на учебно време и ваканции с цел адаптация на промените на климата (топли вълни, наводнения, пожари, екстремни студове)	□ **ДА**	□ **НЕ**
12.	Пълна рехабилитация на сградите за осигуряване на енергийна ефективност	□ **ДА**	□ **НЕ**
13.	Мониторинг на елементите на здравословна среда в сградите на образователната институция (адекватни нива на шум, температура, осветление, качество на	□ **ДА**	□ **НЕ**

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въздуха)
14. Други (моля опишете)

2.15 Кои елементи от подхода Зелена образователна институция съществуват във Вашето училище/ предучилищна/ образователна институция?

1.	Сформиран е координационен екип за обучение, насочено към околната среда и нейното опазване / Зелена образователна институция	☐ **ДА**	☐ **НЕ**
2.	Разработена е концепция за Зелена образователна институция / политика по отношение на околната среда	☐ **ДА**	☐ **НЕ**
3.	Учителите, децата и родителите са запознати с концепцията за Зелена образователна институция /политиката за околната среда	☐ **ДА**	☐ **НЕ**
4.	Разработени са правила за ежедневно поведение за икономия на енергия и вода и за събиране и рециклиране на отпадъци	☐ **ДА**	☐ **НЕ**
5.	Разработват се и се провеждат уроци и отворени събития по въпросите на околната среда, устойчивостта и здравословния начин на живот	☐ **ДА**	☐ **НЕ**
6.	Учебният план е разработен в подкрепа на знанията, свързани с околната среда, устойчивата екологична култура и здравословния начин на живот	☐ **ДА**	☐ **НЕ**
7.	Съществуват партньорства с местни организации, които насърчават устойчивото развитие и здравословния начин на живот	☐ **ДА**	☐ **НЕ**
8.	Учителите са преминали специално обучение за преподаване в областта на околната среда и устойчивото развитие	☐ **ДА**	☐ **НЕ**
9.	План по отношение на здравословното хранене и начин на живот са приети,	☐ **ДА**	☐ **НЕ**

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които подкрепят здравословно хранене
и поведение

2.16 Кои елементи на образователната среда, в подкрепа на концепцията за Зелено образователна институция, съществуват във Вашето училище / предучилищна/ образователна институция?
(Отбележете всички елементи, които са релевантни за вашата образователна институция)

1.	Тематични класни стаи/занимални	☐ **ДА**	☐ **НЕ**
2.	Тематични кътове с информация за околната среда в коридорите и общите интериорни пространства в училището/предучилищното заведение	☐ **ДА**	☐ **НЕ**
3.	Градина за био земеделие	☐ **ДА**	☐ **НЕ**
4.	Интериорни площи с растения/зони за отдих	☐ **ДА**	☐ **НЕ**
5.	Оборудване за контрол на температурата в учебната среда	☐ **ДА**	☐ **НЕ**
6.	Оборудване за контрол на качеството на въздуха в учебната среда	☐ **ДА**	☐ **НЕ**
7.	Алтернативни енергийни системи (пр. соларни) изградени с участието на учениците/децата, с цел да популяризират енергийна ефективност и отговарящи на нужди на учебната институция/проектни дейности	☐ **ДА**	☐ **НЕ**

2.17 Моля изпратете/ прибавете снимка на стандартна класна стая / занималня/ стандартно образователно пространство.

(Моля наименувайте файла както следва: ROOM_и прибавете номера на образователната институция)

2.18 Моля изпратете/прибавете снимка, демонстрираща помещение, което е създадено в отговор на концепцията за Зелена образователна институция.

(Моля наименувайте файла както следва:GREEN_и прибавете номера на образователната институция)

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2.19 Моля изпратете/прибавете снимка, демонстрираща коридор/фоайе, което има кътове за почивка или се използва за работно пространство.

(Моля наименувайте файла както следва:FREE_и прибавете номера на образователната институция)

За директори на училища, които предлагат професионално обучение:

2.20 Моля изпратете/прибавете снимка на стандартно помещение пространство за професионално обучение.

(Моля наименувайте файла както следва:VET_и прибавете номера на образователната институция)

2.21 Ако желаете да добавите коментар относно директната образователна среда във вашата институция моля направете това в полето (ограничение до 300 знака): _

_____
_____
_____
_____

Благодарим за участието!

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Annex 3. List of selected national Operational Programs for the programming period of 2014-2020 prepared by Czech Republic, Estonia, Poland and Slovenia under the thematic objective TO10 "Education and Training". ESF thematic priorities and OP programs: country examples

Comparator countries	**ESF themes under the Educational and Vocational Training thematic priority, 2014-2020**[124]	**Selected OP**[125]
Czech Republic	Access to tertiary and equivalent education	***OP Research, Development and Education*** - equal access to high-quality pre-school, elementary and secondary school; - relevance of education and training for the needs of employers; - reinforcement of training for future and novice teachers; - development of universities and human resources; - improving international excellence of research sector
Estonia	• Support to early childhood, primary and secondary education; • Enhancing equal access to life-long learning	***Operational Programme for Cohesion Policy Funding 2014-2020*** - 11.7% will be invested in reforming the general education network and improving access to high-quality education. An important aim is to reduce early school leaving rates by improving career guidance and by producing innovative study materials. - 11.2% is allocated to boosting the employment rate to 76% by reforming the working ability assessment, by assisting people in finding jobs, and offering education, training and rehabilitation services. Regions' competitiveness of regions will be strengthened on the basis of county competitiveness plans. - 11.0% is dedicated to social inclusion to reduce the rate of people at risk of poverty to 15% in 2020, to promote the availability of higher quality health care services for the entire population, and to improve welfare and social services. Childcare options will be improved in the urban areas of Tallinn, Tartu and Pärnu. The underused urban districts in the larger cities of Ida-Viru County will also be developed.
Slovenia	Enhancing equal access to life-long learning	**Operational Programme for the Implementation of the EU Cohesion Policy in the period 2014 – 2020** The EU funding of EUR 3.011 billion from the European Regional Development Fund (ERDF), the Cohesion Fund (CF), the European Social Fund (ESF) and the specific allocation for the Youth Employment Initiative (YEI) is targeted according to development needs, existing disparities and growth potentials of Slovenia. The total allocation by fund is as follows: - EUR 1.390 billion from the European Regional Development Fund,

[124] ESIF 2014-2020: Finances Planned (detailed): Planned EU financing by detailed ESF themes (categorisation). URL: https://cohesiondata.ec.europa.eu/funds/esf
[125] https://ec.europa.eu/regional_policy/en/atlas/programmes

Comparator countries	ESF themes under the Educational and Vocational Training thematic priority, 2014-2020[124]	Selected OP[125]
		- EUR 895 million from the Cohesion Fund, - **EUR 717 million from the European Social Fund,** - EUR 9 million from the Youth Employment Initiative. Objectives: ✓ Increasing the share of employment, particularly of the long-term unemployed, the young and older people, as well as of the persons with low education levels. ✓ Reducing the number of socially excluded persons and persons at the risk of poverty while increasing the access and quality of community-based services and promoting social entrepreneurship. ✓ Improving the responsiveness of the education and training systems to the needs of the labour market and ensuring equal access to education, trainings and lifelong learning for all groups. ✓ Increasing the institutional capacities and the efficiency of the public administration and public services. Targets: ✓ 25.000 people participating in employment initiatives. ✓ 19.000 people from vulnerable target groups participating in preventive programmes. 42.900 participants involved in programmes to acquire competencies and to raise their level of education.

Annex 4. List of projects in the field of ECEC, general, vocational and higher education prepared by the ESF beneficiaries from selected EU Members States and financed by the European Social Fund under thematic objective on education and training during programming periods of 2007-2013 and 2014-2020

#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
1	Latvia	Career Guidance with Skills Latvia General and Vocational Education Institutions	18,300,000	General Education VET	Career counselling and education centers Career information centers in schools	The focus is on creating a large venue that could really test the learned skill as well as to provide career opportunities later on. Advertisement, info campaign and promotion by celebrities and employers were some examples how they did it. There were tasks, career talks, keynotes, etc.	supporting students in their career development with relevant skills and developing mindsets	The project organizes annual national and sectoral Youth Skills competitions "SkillsLatvia" in which VET students demonstrate excellence in their skills.
2	Lithuania	Lyderių laikas 3 (Time for Leaders 3)	5,502,780	General Education	Potentially very different LE impacted	There were no listed examples as how different leaders utilized the know-how in their schools	to encourage leadership skills within the Lithuanian education system	Through on-the-job training and support school leaders are able to improve the learning environment in various ways

#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
3	Czech Republic	Network Laborky.cz at the Grammar School in Slaný	1,180,045	General Education	STEM classroom Equipment Collaborative teaching areas Conferences	Every participating school receives a package including robotic kits, measuring systems and tablets with measuring software and in return they are expected to conduct experiments of their own and share results and knowledge via video on their own websites with the network	to expand the number of schools which implement similar STEM teaching methods as the National Network Laborky.cz and share knowledge and experience within the network	Every participating school receives a package including robotic kits, measuring systems and tablets with measuring software and in return they are expected to conduct experiments of their own and share results and knowledge via video on their own websites with the network
4	Slovenia	Creative path to knowledge and smart glasses	9,395,444	University	Classroom Workshop space for technology	students spend between three and five months being guided by pedagogical and professional mentors in their chosen research field	to bring together students and companies to develop innovative solutions to corporate and social challenges	There is synergy between all parties: students gain work experience; companies gain help with problem-solving and find employment candidates. Faculties connect theory with practice and find new, innovative approaches to teaching

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
5	Poland	Najlepsi z najlepszych! 2.0. / The best of the best! 2.0.	2,157,505	University	Science laboratories	Teachers and teams of students prepare according to the competition schedule and requirements. No info (in English) if this is extracurricular or part of the regular learning process	provide opportunity for competition, showcase creativity and innovation on an international platform by covering the costs for them to enter international competitions, contests and conferences.	Focused collaboration between university teachers and Ministry officials to provide proper learning environment for completing innovative projects like an efficient solar boat.
6	Poland	Improving the quality of education of students of the Medical University of Gdańsk	4,100,000	University	Equipment Classroom	Regular practices at the equipped classroom	learn vital clinical skills in a realistic setting, through the installation of a new Centre of Medical Simulation (CMS)	35 new teaching rooms have been created where students can practice on lifelike medical mannequins which mimic real symptoms and behaviors –breathe, cry and bleed.

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
7	Poland	Happy Frog Youth Clubs	23,800	General Education	Workshop spaces Outdoor activities No information about LE in school facilities	two youth clubs have set up their facilities to provide the learning spaces	to improve school results, self –esteem and potential for joining the labor market	supplementary educational activities to help improve comprehension, writing, math and digital literacy skills combined with free-time activities such as canoeing, sailing, arts workshops or outdoor games.
8	Portugal	The Schools Cluster Dr. Azevedo Neves (Agrupamento de Escolas Dr. Azevedo Neves)/ Tackling early school leaving in Portugal	907,541	VET	Classroom	vocational training courses complementary adult education options	Preventing classroom violence and reducing absenteeism and school drop-out rates, while improving competences in math and languages	vocational training courses for young people and a number of complementary adult education options, such as Portuguese classes for foreigners

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
9	Spain	Encouraging more girls into science and technology	15,466	General Education	ClassroomSTEM classroom	Teaching methods to promote creativity, teamwork, problem-solving, presentation skills. Classroom arrangement, Interacting with various devices, Visiting real work places, Physical activity in the classroom	to encourage more girls into STEM careers	series of engineering and technology-related workshops
10	Malta	One Tablet Per Child - OTPC	9,600,000	General Education	Classroom Equipment	Digital teaching and learning framework Tablets Management software and training for teachers Online space for better use of each tablet	to continue learning and teaching during the COVID 19 school closure	Along tablets for students, schools also receive the necessary classroom management software, educational programs and applications, and staff training

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
11	Cyprus	DRASE (DRAsis Sholikis ke kinonikis Entaxis)	29,000,000	ECD General education	Classroom	new learning and creativity programs, access to new information and socio-emotional support centers, new school technological equipment and educational materials, and training programs for teaching staff	Reducing the likelihood of failing at school, or dropping out completely and preventing social exclusion	new learning and creativity programs such including arts in the learning process: dancing, drawing
12	Croatia	Festival of multiculturalism - developing intercultural competences	167,945	General Education (primary school)	Classroom Creativity workshops Art performances On-site learning – role plays	The schools and municipality developed materials for teachers, procured new equipment for the schools and designed extracurricular activities for students.	to accept diversity and to be tolerant, to learn to be the new modern citizens of Croatia, Europe, and the world	to discover their new talents, develop skills and creativity; they sang, danced, played, acted, cooked, made souvenirs, researched, were journalists and scientists, travelled, met new friends and new Croatian regions. They learned about theirs but also about other cultures and customs

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
13	Croatia	Lumen	107,998	General Education	Teacher learning space Classroom	create innovative workshops around five themes relating to giftedness, and to pilot them in nine schools	to identify and to work with them to help develop their potential	offering educational support and permanent mentoring services for gifted pupils and their families
14	Croatia	PERMA-HORTI	97,499	General Education	Classroom	Classes also focused on building valuable skills such as organization, teamwork, self-awareness and communication.	build students entrepreneurial capacity and have therapeutic effect on the students	introduced specially designed entrepreneurship classes for high school students, to encourage them to think about the potential of creating a start-up business
15	Croatia	ZadarZaDar	110,091	General Education (primary school)	Classroom Equipment	Online platform for communication Studying biology, physics, chemistry and geography in real life situations through experiments, projects, presentations, models	identifies gifted children and educates them in a way that makes the most of their talents	created new teaching materials for local schools, as well as an online platform where teachers can collaborate

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
16	Hungary	Együtt működik! Boldog Ceferino Program	308,840	General Education University	Various spaces for extracurricular activities	Individual mentoring Cooperative learning space depending on research	to help its Roma students to feel more empowered and engaged	The projects isn't focused exclusively on LEs. They are more of a indirect effect and include individual mentoring and involving students in university research activities
17	Slovakia	School open to everyone	25,400,342	ECD General education	Classroom Teacher training space	Course for professional development for teachers and learning resources Creation and Implementation of the pedagogical model of inclusive education: cooperation with parents, pedagogical assistants, building habits through non-formal education	to support inclusive education and improve the professional competencies of pedagogical staff and professional staff to ensure equal access to quality education and to improve the results and competencies of children and pupils	Incorporation of teaching assistants such as school psychologist, special pedagogue, social pedagogue and psychologist CPPPaP

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
18	Slovakia	"If you can explain me something"	271,010	VET	Classroom Equipment	training and professional development of the college teaching staff to prepare them in introducing the new equipment	to make lessons more innovative and in line with the needs of local employers	purchased a variety of computers, software, machinery, teaching aids and book collections including a hands on learning package to acquire the relevant skills in a real job-like environment
19	Austria	Vocational school (Produktionsschule) ÖJAB	318,945	VET	Classroom	Training modules for experimenting with certain vocational activities and Workshops for building cultural and digital skills	to get the participants job-ready and capable of finding an apprenticeship, or further training towards the career they want	Training modules on offer allow students to try out activities in a range of sectors – catering and gastronomy, office administration, hospitality, practical trades and handicrafts – and then to choose a specialty

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#	Country	Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
20	Finland	Ernod - Youth with special needs and supporting participation in multidisciplinary environments	329,224	University	Library computer room	Library managers set up the space for the volunteers and provide the technical assistance needed	to teach young people digital and media skills, and to include young people with special needs in the planning of ventures – attracting more customers to public libraries	Volunteers provide online homework support to their peers from minority groups
21	Finland	Höntsä - Bridge Forward!	942,110	University General Education	Classroom	secondary degree educational institutes, extracurricular organizations and the public sector cooperate to provide the learning spaces and methodology	Train them in a creative teaching method with which they can share their hobbies, run an exercise or sports class	Höntsä's multidisciplinary model combines youth work, cultural work, physical activities, wellbeing, social welfare and health care

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Annex 5. ESF projects completed in 2007-2013

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
1	Italy		Moving up in the world	78,667	General Education	Theater workshops and information spaces Career information centers in schools	Mobile LE. The theater workshops were places for acting and discussion. Does not specify the methodology or details over the physical environment	promote respect for diversity, the prevention of violence and bullying at school, and an enhanced awareness of how to use new web technologies	A touring theatre workshop provides pupils with the opportunity to act out and analyze their experiences, finding their own answers to problems of intolerance and aggression
2	France		Guiding struggling youth towards a career path/ Support unit for qualifications and integration (PAQI)	13,608	VET	The units to assist with qualifications and integration. The units are set up in vocational training schools	No additional information how they went about in creating these units	to integrate them into professional life or find suitable training	Units have training periods which enable young people to ensure they have the prior educational knowledge needed for the training

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
									programme, or to get them up to the level required
3	Greece		Digital applications offer new possibilities to classes!	8,850,000	General Education	1. Centralized on-line service for organizing digital content 2. Website serving as an open source library 3. Digital networking environment for students	No additional information	digital upgrade of the educational progress	digital e-platform “e-me” aspires to become a networking environment where students and teachers will participate and cooperate

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
4	Greece		Academy of Plato - The paths to knowledge	N/A	General Education University	Separate LE from formal learning institutions: Summer school with workshops, learning modules, outdoor activities and observation sites/ visits	Experts in the different fields came together to plan out the training modules and activities which were carried out throughout the year	to connect Greek society with the spirit of the Academy of Plato as an area of education and culture, as well as a place to develop the personality and shape the active citizen	"Dialogues" programmes which familiarized students from many areas of Greece with the concepts of dialogue, argument and critical thinking. Summer Schools for Applied Research, Philosophy, Ancient Theatre and Modern Greek Studies were also organized, in which 190 Greek and foreign students and graduates, PhD candidates and researchers participated

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
5	Bulgaria		Making school life a central attraction	45,479,121	General Education	Classroom Extracurricular activities	No additional details	to reduce the number of early school leavers by improving employment opportunities	Activities are designed to develop the personal, intellectual and physical abilities of the students – building team-working capacities, improving self-expression and teaching presentation skills.
6	Hungary		Equal education for…everyone/ Tanodas	7,493,024	General Education Potentially ECD	Classroom Equipment	The little information just mentions mentors for Roma pupils and in some cases providing necessary equipment	Ending social exclusion and putting an end to the cycle of poverty through equal access to proper education	Tanodas are extra-curricular schools which offer tutoring based on individual development, community, cultural and sport activities, and work to strengthen the

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
									relationship between schools and parents
7	Hungary		Improving the quality of higher education through centers of excellence in strategic research areas at the University of Miskolc	7,261,043	University	Research labs Equipment	No additional information	improving already existing centers of excellence and research and innovation activities in strategic areas of international significance	development of the university's laboratory infrastructure and equipment, the development of an advanced computer network and the strengthening of its international network of scientific institutions
8	Lithuania		Graduating with a (business)	698,160	University	Special workshop spaces established by	No additional information	to acquire the practical skills and experience	Working in teams, the students took

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
			plan/ ATVERK (OPEN UP)			the corporate partners		required to start their own business even before graduating	on different roles such as engineer, designer, marketing or financial expert and tried out the practical implementation of their business idea in especially designed workshop spaces
9	Lithuania		Getting drop-outs back to school/ Targeted support brings dropouts back to school	2,420,000	General Education	Classroom	No additional information	improve access to education	participants received assistance in doing their homework and participated in group activities in order to experience success in the learning process, hone

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									their creativity or work on their interpersonal skills. Psychological counselling was also included
10	Lithuania		Teacher training and re-training system development (stage III)	2,067,696.0	General Education Professional Education	Classroom	No additional information	to improve teachers 'qualification process, to search for new forms of qualification improvement and innovations, to improve teachers' general, subject and didactic competencies.	Teachers can choose various ways to improve their qualification: university courses, teaching methodology and textbook compilation, educational project management and participation in their

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
									implementation, as well as internships in educational, scientific and cultural institutions and companies in both Lithuania and elsewhere
11	Lithuania		Successful business path/ From the classroom to the boardroom	551,620	University	Classroom Virtual learning space	No additional information	to develop the personal, technical, entrepreneurial and business management skills required to set up and run a successful business in today's knowledge economy	After a combination of theoretical training such as accounting, sales, marketing or staff management and practical hands-on business experience in a company, students have

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
									access to mentors and enter a competition for the best business plan
12	Lithuania		I'm choosing teaching! / Selected specialists for schools	208,789	General Education	Classroom Learning Aids	Classroom (improved materials and teaching methodology)	to assist students in achieving their best results	After a rigorous selection, young professionals spend two years working in schools. They are trained and supported throughout the program and 2/3 of them continue teaching

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
13	Romania		Modern systems for receiving, evaluating and informing on doctoral (PhD) theses and for managing academic titles within the Ministry of Education and Scientific Research	N/A	University	Virtual environment Technology	No additional information	to enhance organizational efficiency, bring greater transparency to the way in which PhD theses and academic publications are processed and evaluated	An IT solution which includes: a database management system; a module for indexing and searching; and a communications and publications portal.
14	Romania		Quality in education – a step to equality	719,476	ECD	Classroom	No additional information	to get more Roma and non-Roma children into education and keep them there, starting at the pre-school phase	The organization applied an intercultural curriculum in kindergartens and also trained teachers to apply it. - an intervention model was developed to

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									identify and support pupils at risk of dropping out. - The organization also supported bilingual teachers and set up support groups that include parents.
15	Romania		Convergence between academic training and active life/ Improving skills through quality internships	3,266,507	University	On the job training environment	No additional information	To help students being more competitive in the labor market through improving their skills in internships	The project had three components: workplace training for students; information campaigns related to the opportunities of internships; and training programmes and the development of

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
									guides for counsellors and instructors who assisted the student
16	Poland		Making vocational education in IT more attractive for technical schools in Elblag	73,600	VET	Classroom Technology	Licensed IT courses	to encourage students to continue their education and professional careers in the IT field	the school developed attractive information technology courses and lectures where they could listen to top practitioners In addition, students could take courses certified by international IT organizations –

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									such as the Microsoft IT Academy and Cisco Systems
17	Poland		School first experiences as a way to knowledge	9,500,000	General education (Primary schools)	Classroom Equipment	No additional information	to create conditions that allow primary school pupils the space to develop all aspects of their intelligence	The project arranged the developing of various 'intelligences' in 3 stages and for each one provided required teaching materials such as sports equipment, musical instruments, board games and digital

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									microscopes It also included special training for teachers to engage better the parents and raise their awareness for the learning process

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
18	Poland		Modernization of vocational education in Małopolska - Tailoring skills to the local jobs market	N/A	VET	Classroom Spaces for career counseling Equipment (vocational training laboratories)	No additional information	to improve the attractiveness and performance of vocational schools for students and to help them co-operate more closely on employment matters with regional enterprises	Training courses that respond to local employment opportunities such as training as chefs or confectioners for the catering sector, as car mechanics and in electrical engineering for the automobile sector - Career consulting and classes in key competences such as foreign languages and technical subjects.

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19	Poland		Education in Computer Science	1,005,962	University	Classroom (external experts as lecturers) Project based learning no information for altered spaces Real working environment	No additional information	to get young IT specialists ready for the jobs market through additional math courses and internships in cooperation with major businesses	for one or two semesters, the students worked in small teams carrying out projects commissioned by various companies such as Roche, Samsung and IBM
20	Poland		A bridge to the future	369,543	General Education VET	Outdoor workshops Real working environment		to become active members of society through practical approach combining socialization and vocational education in 'real life' contexts.	The implementation of the social skills training and apprenticeships were carried out in parallel and in an open social environment outside the institution

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21	Poland		I talk though I don't speak – alternative methods of communication for pupils of school No 26 in Toruń	61,500	ECD General education (Primary school)	Classroom/School learning spaces Learning materials	Each pupil had his or her own 'communications book' adapted to their own circumstances and abilities. The book consists of independently created pictographic representations of school-based themes – such as class timetables and school regulations.	create a systematic approach to address students' communication problems.	Teachers and therapists were trained as well and able to broaden their teaching experience and gain professional qualifications.

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22	Portugal		The 'Escolhas' (Choices) school-programme/ Building a better future for children and young people	366,730	General education	Classroom Equipment Outdoor spaces	Musical performances Physical activity in the classroom Digital skills training	improve educational attainment by about 65 % while reintegrating participants into school, training or employment.	Cooperation and alignment in funding projects amongst many parties - Municipalities, immigrant associations, schools, youth groups, civil society bodies and private institutions
23	Spain		PIRTU Personal Investigador de Reciente Titulación Universitaria - Personal Researcher of Recent University Degree/ Supporting research	12,563,248	University	Science laboratories Equipment	No additional information	to improve their technical research skills and build a career in Spain, rather than having to work abroad or leave the profession	networking activities between universities, research centers and companies

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			careers in Castilla y Leó						
24	Malta		MCAST: creating world class vocational training	2,838,860	VET	Classroom	Blended learning	equipping people with the particular and practical skills that the country's industry and economy need	'blended learning' – a combination of online and classroom study that can improve access to learning and career growth - Re-writing levels of curricula to create more relevant training

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25	Italy		School Mechanism/ Equipping students with skills for life – and work	419,600,000	General education	Classroom	language courses in a native environment; internships at a working environment	to learn new skills, study abroad and get a taste of working life supplementing regular teaching	language courses in a native environment; internships at a working environment
26	Italy		Diritti a Scuola/ Support measures to keep children in school	75,234,327	General education	Classroom Spaces for counselling	vocational guidance and intercultural mediation services to the children and their families – e.g. Help desk for information services	to tackle school drop-out rates and raise levels educational attainment: Italian and mathematics	vocational guidance and intercultural mediation services to the children and their families – e.g. Help desk for information services
27	Italy		Going to Business School/ Young entrepreneurs start to grow in the classroom	250,000	General education	Classroom	Specialized training, not mentioned where and how it's done	to train students for a new work culture stimulating the relevant skills	divided into teams and, using what they have learnt in their specialist training, simulate a business project,

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
									developing an idea and writing a business plan
28	Slovakia		Helping marginalized Roma pupils make the grade	177,679	General education (Primary school)	Classroom	Pupils were exposed to variety of activities in different settings. Physical LE was related to the lab equipment and spaces for dancing, singing, cooking	more successful transition from 1st grade to 2nd grade primary school while respecting their social and cultural values	The pupils were also introduced to new technology – for example, in biology classes they learned to work with cameras and microscopes. Art and music sessions proved to be very popular, giving these marginalized youngsters the opportunity for self-expression.

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30	Germany		Technology for kids	950,490	General education (Primary school)	Technical workshops	Retired engineers introduce technology to students in workshops betting on relevance to their own environment learning through immersion and fun.	To promote career in technical fields	Students attend a workshop where they could build their own prototype e.g. of a car and race with it
31	Germany		A different pathway for struggling pupils/ Productive learning	2,570,000	General education	On the job training environment Practical workshops in school	Individual learning plans are put together with the help and guidance of teachers. The course includes real working environment learning, workshops to improve their social skills and self-esteem	preventing early dropouts without qualification	Key elements of Productive Learning include spending three days a week working in a “real life” environment, such as a company or institution, plus two days a week learning in a study workshop at school.

#	Country		Project title	ESF funding EUR	Edu level	LE targeted	LE details (what was done and how)	Project aim	Example of good practice
32	Germany		JUNIOR – Students experience business	467,500	General education	Online platform for networking	Student teams apply and compete in creating a successful business with other student companies. They are supported by mentors, trainings and online platform.	to assist students in learning how to develop and implement a business idea and gaining the relevant skills	Student companies can network internationally via a website and benefit from mentors and skills training
33	UK		Sparking interest in science and engineering/ STEMCymru	N/A	General education	Classroom Additional practical workshops in schools	Workshops are designed to be captivating but also to demanding better levels of math, physics. Students have to do formal presentations to judges and get sponsorship from companies	Promote career in science, technology, engineering or math	design a Formula One car by harnessing digital manufacturing technologies. Drawings were converted to models which were tested against other teams at racetracks.

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Annex 6. Learning Environments Dynamic Tables **(provided as a separate file to this report)**

References

Pre-school and School Educational Act

Higher Educational Act

Ministry of Education and Science 2014. ***Artificial intelligence in Education and science: Ideas for the development and use of AI in education and science in the Republic of Bulgaria***, https://www.mon.bg/bg/143, latest visit 09 August 2020

Ministry of Education and Science 2015. ***Strategy for the development of vocational Education and Training in the Republic of Bulgaria for the Period 2015-2020***, https://www.mon.bg/bg/143, latest visit 09 August 2020

Ministry of Education and Science 2014. ***Strategy for Effective Implementation of ICT in the Education and Science the Republic of Bulgaria (2014-2020),*** https://www.mon.bg/bg/143, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** **"Providing a modern educational environment" 2020,** https://www.mon.bg/bg/100814, latest vsit 09 August 2020

Ministry of Education and Science. ***National Program*** **"Providing a modern educational environment" 2019,** https://www.mon.bg/bg/100653, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Providing a modern educational environment" 2018***, https://www.mon.bg/bg/100437, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Providing a modern educational environment" 2017***, https://www.mon.bg/bg/1375, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Providing a modern educational environment"*** **2016** *https://www.mon.bg/bg/1849*, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***ICT in the system of pre-school and school education"*** **2020,** https://www.mon.bg/bg/100814, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***ICT in the system of pre-school and school education" 2019***, https://www.mon.bg/bg/100653, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***ICT in the system of pre-school and school education" 2018,*** https://www.mon.bg/bg/100437, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "**ICT in the system of pre-school and school education" 2017**, https://www.mon.bg/bg/1375, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "**ICT in the system of pre-school and school education" 2016**, *https://www.mon.bg/bg/1849*, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Creating accessible architecture and security in schools" 2020,*** https://www.mon.bg/bg/100814, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Creating accessible architecture and security in schools" 2019***, https://www.mon.bg/bg/100653, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Creating accessible architecture and security in schools" 2018***, https://www.mon.bg/bg/100437, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Creating accessible architecture and security in schools" 2017***, https://www.mon.bg/bg/1375, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Accessible and secure school" 2016***, *https://www.mon.bg/bg/1849*, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***Optimization of school network" 2016,*** *https://www.mon.bg/bg/1849*, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***Optimization of school network" 2017,*** https://www.mon.bg/bg/1375, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***We succeed together" 2019,*** https://www.mon.bg/bg/100653, latest visit 09 August 2020

Ministry of Education and Science. ***National Program "Provision of Modern conditions for children and students in Personal development Support Centers" 2020***, https://www.mon.bg/bg/100814, latest visit 09 August 2020

Ministry of Education and Science. ***National Programme*** "**Building STEM environment in schools" 2020,** https://www.mon.bg/bg/100814, latest visit 09 August 2020

Ministry of Education and Science. ***National Program*** "***We succeed together" 2020,*** https://www.mon.bg/bg/100814, latest visit 09 August 2020

Ministry of Education and Science. ***Instructions for implementation of the activities in Project BG05M2OP001-2.004-0004 Development of school students 'abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1***

Ministry of Education and Science. APPLICATION GUIDELINES under the procedure of direct funding ***BG 05M20P001-2.004 Development of school students 'abilities and raising their motivation for learning through activities developing specific knowledge, skills and competences (Your Class) – Phase 1***

Ministry of Education and Science. APPLICATION GUIDELINES under the procedure of direct funding ***BG05M2OP001-2.014 – 0001 - Support of Dual Learning System***

Ministry of Education and Science. ***Instructions for implementation of the activities in Project BG05M2OP001-2.012-0001 Education for tomorrow***

Ministry of Education and Science. APPLICATION GUIDELINES under the procedure of direct funding

BG05M2OP001-2.012-0001 - Education for tomorrow

Ministry of Education and Science. APPLICATION GUIDELINES under the procedure of direct funding ***BG05M2OP001-3.003-0001 - Support for Equal Access and Personal Development***

Strategy for development of education in the municipality of Plovdiv 2017 - 2022 https://www.plovdiv.bg/item/education/%D1%81%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D0%B8%D1%8F-%D0%B7%D0%B0-%D1%80%D0%B0%D0%B7%D0%B2%D0%B8%D1%82%D0%B8%D0%B5-%D0%BD%D0%B0-%D0%BE%D0%B1%D1%80%D0%B0%D0%B7%D0%BE%D0%B2%D0%B0%D0%BD%D0%B8%D0%B5/ latest visit 16 August 2020

OP SESG, version 3.0, 31.10.2019, p. 8, available in Bulgarian at http://sf.mon.bg/?go=page&pageId=32, latest visit 16 August 2020

National statistical institute - https://www.nsi.bg/, latest visit 16 August 2020

Municipality of Plovdiv web page: https://www.plovdiv.bg/item/education/%D0%BE%D0%B1%D1%89%D0%B8%D0%BD%D1%81%D0%BA%D0%B0-%D0%BE%D0%B1%D1%80%D0%B0%D0%B7%D0%BE%D0%B2%D0%B0%D1%82%D0%B5%D0%BB%D0%BD%D0%B0-%D0%BF%D1%80%D0%BE%D0%B3%D1%80%D0%B0%D0%BC%D0%B0-2017-2020/, latest visit 25 August 2020

Responding to Educational Inequality, Berkeley, CA: Haas Institute for a Fair and Inclusive Society, University of California, Berkeley, September 2016., http://haasinstitute.berkeley.edu/sites/default/files/haas_institute_race_education_brief_june_2017_1.pdf, latest visit 16 August 2020

DG Employment. (2018). Programming period 2014-2020. Monitoring and Evaluation of European Cohesion Policy. European Social Fund. Guidance document. URL: https://ec.europa.eu/sfc/en/system/files/ged/ESF%20monitoring%20and%20evaluation%20guidance.pdf

Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0320:0469:EN:PDF

Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0470:0486:EN:PDF

Blackmore, J., Bateman, D.D., Loughlin, D.J., O'Mara, D.J., Aranda, G., 2011. Research into the Connection between Built Learning Spaces and Student Outcomes (Literature Review No. 22). Department of Education and Early Childhood Development, State of Victoria, Melbourne.

Broto, C. (2012). The Complete Book of Playgrounds Design. Links International.

Designing for Education. Compendium of Exemplary Educational Facilities 2011. DOI:https://dx.doi.org/10.1787/9789264112308-en

Imms, W., Mahat, M., Byers, T. & Murphy, D. (2017). Type and Use of Innovative Learning Environments in Australasian Schools ILETC Survey No. 1. Melbourne: University of Melbourne, LEaRN, Retrieved from: http://www.iletc.com.au/wp-content/uploads/2017/07/TechnicalReport_Web.pdf

Hillman, C. H., Kamijo, K., & Scudder, M. (2011). A review of chronic and acute physical activity participation on neuroelectric measures of brain health and cognition during childhood. Preventive medicine, 52 Suppl 1, S21–S28. https://doi.org/10.1016/j.ypmed.2011.01.024

KfW Panel 2019. https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-KfW-Kommunalpanel/KfW-Kommunalpanel-2019.pdf

Lawson Foundation. (2020). Increasing Outdoor Play in Early Learning and Child Care in the Context of COVID-19. English version available at http://www.lawson.ca/op-elcc-covid19.pdf. French version available at http://www.lawson.ca/op-elcc-covid19-fr.pdf.

Møller Petersen, C., & Rasmussen, B. (2012). Acoustic design of open plan schools and comparison of requirements. In P. Juhl (Ed.), Proceedings of BNAM2012 Nordic Acoustic Association. Joint Baltic-Nordic Acoustics Meeting (BNAM), Proceedings, Vol. 2012 http://vbn.aau.dk/files/69932466/BNAM2012_Paper73CMP_BiR_AcousticDesignOpenPlanSchools.pdf

Nucci, L., Galimberti, L. Towards a new school's role in the Italian contemporary city. City Territ Archit 7, 2 (2020). https://doi.org/10.1186/s40410-019-0110-3