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Integrating education with human behaviour relevant to influence of coronavirus and negative emotions in a built environment (MICROBE)

Partner country report on current state of higher education and its relationship with humans' behaviour on influence of coronavirus and negative emotions in a built environment

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1 INTRODUCTION

The purpose of this series of country reports is to obtain general philosophical, pedagogical and practical understanding on the status of higher education and its impact on minimizing the influence of coronavirus and negative emotions in a built environment by applying behavior change in partner countries. It will also provide a basis for understanding and evaluating the capabilities of partner institutions on integrated education for influence of coronavirus and negative emotions in a built environment. The results of these reports will inform a capacity building framework, which will form the basis for development of modules on influence of coronavirus and negative emotions in a built environment during the MICROBE project. The reporting approach is based on the Capacity Needs Assessment Methodology (CAPNAM) proposed by the United Nations (2013).

The report includes chapters on the following:

- Context. Provides an overview of the regulatory, socio-political, and cultural factors that shape policy on the human behaviour relevant to influence of coronavirus and negative emotions in a built environment in the country in general, and education in particular.
- Scope and coverage of education policies on influence of coronavirus and negative emotions in a built environment by the Higher Education Institution (HEI). Examines the illustrative policy and planning issues relevant to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment.
- Description of capacity types. Evaluates the existing state of capacities of HEI in the field of integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment. As defined by the CAPNAM analytical framework, the four types of categories are institutional, organisational, individual, and the knowledge base.

The content of this report is related to the MICROBE Project and reflects only the author's view. The National Agency and the Commission are not responsible for any use that may be made of the information it contains.



2 CONTEXT

This section provides an overview of the regulatory, socio-political, and cultural factors that shape policy on the human behaviour relevant to influence of coronavirus and negative emotions in a built environment in the country in general, and the education in particular. Please answer following questions.

2.1 Socio-political and cultural context

What are the socio-political and cultural contexts providing the framework for educational policy planning in the field of human behaviour relevant to influence of coronavirus and negative emotions in a built environment in the country? Are there any regulations, plans, etc.?

COVID-19 cases have increased significantly in Lithuania. At the beginning of December, Lithuania is one of the first countries in Europe in terms of COVID-19.



Fig. 1. Total coronavirus cases in Lithuania (Worldmeter, 2021)

Lithuania tightened lockdown from December 16, 2020. The majority of shops, with the exception of those selling food, was closed in Lithuania. People are allowed to leave their homes only for serious reasons but families will be allowed to go for walks in open spaces within their municipality, without meeting with other people.

The Government of the Republic of Lithuania has created an official source of published information on the situation of Covid - 19 in Lithuania, which also publishes information and recommendations for the educational community (<u>https://koronastop.lrv.lt/</u>).

2.2 Status of education

What is the current state in education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment? Is it important at your country? Please specify.

Lithuanian universities do not have BSc or MSc study programs or separate disciplines on COVID-19.

Lithuanian universities have various modules in BSc on urban planning:

- 1. Vilnius Gediminas Technical University:
 - a. Faculty of Environmental Engineering. BSc in Road and Railway Engineering, Urban Engineering (specialization: Urban Engineering; modules: Urban planning and infrastructure, Integrated project (Urban development))



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(https://www.vgtu.lt/stojantiesiems/bakalauro-ir-vientisosios-studijos/studijuprogramos/317451?element_id=317452&sp_id=30&f_id=5&qualification=a%3A2% 3A%7Bi%3A0%3Bs%3A1%3A%22B%22%3Bi%3A1%3Bs%3A1%3A%22A%22%3B%7D).

- b. Faculty of Civil Engineering. BSc in Construction and Real Estate Management (module: Basics of sustainable environmental development) (<u>https://www.vgtu.lt/stojantiesiems/bakalauro-ir-vientisosios-studijos/studiju-programos/317451?element id=317452&sp id=310&f id=7&qualification=a%3A2 %3A%7Bi%3A0%3Bs%3A1%3A%22B%22%3Bi%3A1%3Bs%3A1%3A%22A%22%3B% 7D#Studij%C5%B3%20dalykai).
 </u>
- 2. Kaunas University of Technology:
 - a. Faculty of Electricity and Electronics. BSc in Renewable Energy (modules: sustainable development) (<u>https://stojantiesiems.ktu.edu/programme/b-atsinaujinancioji-energetika/#dalykai</u>)
 - b. Faculty of Construction and Architecture. BSc in Civil Engineering (modules: sustainable development) (<u>https://stojantiesiems.ktu.edu/programme/b-statybos-inzinerija/</u>). BSc in Architecture (module: Urban planning (<u>https://stojantiesiems.ktu.edu/programme/v-architektura/#S240M104</u>)

Lithuanian universities also have various modules in MSc on urban planning:

- Vilnius Gediminas Technical University:
 - a. Faculty of Environmental Engineering. MSc in Urban Engineering Information Systems (modules: Urban infrastructure (with course project), Sustainable urban development) (<u>https://www.vgtu.lt/stojantiesiems/magistranturos-studijos/studijuprogramos/317403?element id=317404&sp id=38&f id=5&qualification=a%3A1% 3A%7Bi%3A0%3Bs%3A1%3A%22M%22%3B%7D#Studij%C5%B3%20dalykai)
 </u>
 - b. Faculty of Civil Engineering. MSc in Real Estate Management (module: Development and management sustainable built of а environment) (https://www.vgtu.lt/stojantiesiems/magistranturos-studijos/studijuprogramos/317403?element id=317404&sp id=67&f id=7&qualification=a%3A1% 3A%7Bi%3A0%3Bs%3A1%3A%22M%22%3B%7D#Studij%C5%B3%20dalykai). MSc in Construction Technologies and Management (module: Sustainable territorial development and planning (https://www.vgtu.lt/stojantiesiems/magistranturosstudijos/studijuprogramos/317403?element id=317404&sp id=58&f id=7&qualification=a%3A1% 3A%7Bi%3A0%3Bs%3A1%3A%22M%22%3B%7D#Studij%C5%B3%20dalykai)
- Kaunas University of Technology:
 - a. Faculty of Construction and Architecture. MSc in Sustainable and Energy Efficient Buildings (module: Sustainable architecture and construction) (<u>https://stojantiesiems.ktu.edu/programme/m-darnus-ir-energetiskai-efektyvus-pastatai/#T230M014</u>).

There also are several Faculties of Civil Engineering in Lithuanian universities: Vilnius Gediminas Technical University (Faculty of Civil Engineering: <u>https://www.vgtu.lt/civil-engineering/about-faculty/structure/54779</u>) and Kaunas University of Technology (Faculty of Construction and Architecture: <u>https://saf.ktu.edu/</u>). They teach disciplines related to the built environment (Smart City and Analytics (with course project), Development and Management of a Sustainable Built Environment, Development of Energy Efficient Buildings and Renewable Energy Sources) (<u>https://www.vgtu.lt/stojantiesiems/magistranturos-studijos/studiju-</u>



programos/317403?element id=317404&sp id=67&f id=7&qualification=a%3A1%3A%7Bi%3A0% 3Bs%3A1%3A%22M%22%3B%7D#Studij%C5%B3%20dalykai).

Modules related to depression, stress, emotions are taught in the Psychological, Philosophy, Public Health and Social Sciences Faculties of Lithuanian universities:

- Vilnius University (<u>https://www.fsf.vu.lt/studentams/bakalauro-studijos/psichologija</u>)
- Vytautas Magnus University (<u>http://smf.vdu.lt/katedros/psichologijos-katedra/</u>)
- Klaipeda University (<u>https://www.ku.lt/shmf/struktura/katedros/psichologijos-katedra/</u>)
- Mykolas Romeris University (<u>https://www.mruni.eu/psichologijos-institutas/</u>)
- The Lithuanian University of Health Sciences (<u>https://lsmuni.lt/lt/struktura/medicinos-akademija/visuomenes-sveikatos-fakultetas/apie-fakulteta/</u>).

According to analysis results, we can state that there are neither BSc nor MSc studies related to MICROBE topics in the world. There are several universities with disciplines related to MICROBE topics. At present, we have not found separate undergraduate or graduate studies in higher education related to the impact of coronavirus on national economies. However, there are published programs on this topic. This is the Oxford University Business Economics Programme "The Economics of Post-Crises Recoveries" (https://www.economics.ox.ac.uk/article/new-expertseminar-series-to-explore-economics-of-post-crisis-recoveries#/). The London School of Economics Politics conference and is organizing а "Shaping the post-COVID World" (https://www.lse.ac.uk/International-History/Events/2021/learning-from-history-for-a-post-covidworld). The conference will discuss the direction the world can and should take in the aftermath of this crisis and the policies to be pursued by national and global actors. Conference topics: the macro economy; environmental sustainability and climate change; health, social care and others.

2.3 Funding

Is funding sufficient for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment at your country? Please specify.

- The main funding covers only teaching activities. In this field, the sciences of medicine (study programs on epidemiology) and the built environment (its development, management) are financed.
- Research and development funding is mainly via grants and projects;
- No sufficient special funding for curriculum development.

2.4 Educational needs

What are the needs in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment (please list up to 5 major needs at country level):

The 2030 Agenda for Sustainable Development provides many of the necessary signposts and guidelines. The International Commission on the Futures of Education—established by UNESCO in 2019 and composed of thought leaders from the worlds of academia, science, government, business and education—presents nine ideas for concrete actions today that will advance education tomorrow (UNESCO2020):



- 1. Commit to strengthen education as a common good. Education is a bulwark against inequalities. In education as in health, we are safe when everybody is safe; we flourish when everybody flourishes.
- Expand the definition of the right to education so that it addresses the importance of connectivity and access to knowledge and information. The Commission calls for a global public discussion—that includes, among others, learners of all ages—on ways the right to education needs to be expanded.
- 3. Value the teaching profession and teacher collaboration. There has been remarkable innovation in the responses of educators to the COVID-19 crisis, with those systems most engaged with families and communities showing the most resilience. We must encourage conditions that give frontline educators autonomy and flexibility to act collaboratively.
- 4. Promote student, youth and children's participation and rights. Intergenerational justice and democratic principles should compel us to prioritize the participation of students and young people broadly in the co-construction of desirable change.
- 5. Protect the social spaces provided by schools as we transform education. The school as a physical space is indispensable. Traditional classroom organization must give way to a variety of ways of 'doing school' but the school as a separate space-time of collective living, specific and different from other spaces of learning must be preserved.
- 6. Make free and open source technologies available to teachers and students. Open educational resources and open access digital tools must be supported. Education cannot thrive with ready-made content built outside of the pedagogical space and outside of human relationships between teachers and students. Nor can education be dependent on digital platforms controlled by private companies.
- 7. Ensure scientific literacy within the curriculum. This is the right time for deep reflection on curriculum, particularly as we struggle against the denial of scientific knowledge and actively fight misinformation.
- 8. Protect domestic and international financing of public education. The pandemic has the power to undermine several decades of advances. National governments, international organizations, and all education and development partners must recognize the need to strengthen public health and social services but simultaneously mobilize around the protection of public education and its financing.
- 9. Advance global solidarity to end current levels of inequality. COVID-19 has shown us the extent to which our societies exploit power imbalances and our global system exploits inequalities. The Commission calls for renewed commitments to international cooperation and multilateralism, together with a revitalized global solidarity that has empathy and an appreciation of our common humanity at its core.

COVID-19 presents us with a real challenge and a real responsibility. These ideas invite debate, engagement and action by governments, international organizations, civil society, educational professionals, as well as learners and stakeholders at all levels (UNESCO 2020).

There are certain trends that are likely to take center stage in the field of education in the coming years. These are (AnalyticsInsight.net 2020):

- Personalized Learning Environment;
- Contactless Attendance;
- Gamification;
- Augmented Reality/Virtual Reality.



According to the search for coronavirus in a built environment in other universities' MSc programmes, no similar study programs and modules were found. There is some Masters of Science in Epidemiology programmes. For example, Master in Epidemiology and Biomedical Data Science at the University of Oulu, Master in Epidemiology at Utrecht University, MSc in Clinical and Psychosocial Epidemiology at the University of Groningen, Infectious Diseases MSc at The University of Edinburgh - College of Medicine & Veterinary Medicine, etc. More MSc programmes in this field could be found by this link: https://www.healthcarestudies.com/MSc/Epidemiology/Europe/. Furthermore, only a few universities have offered epidemiology as a course of study at the undergraduate level. One notable undergraduate program exists at Johns Hopkins University, where students who major in public health can take graduate-level courses, including epidemiology, during their senior year at the Bloomberg School of Public Health. These study programs are focused on the analysis of the epidemiological situation, statistics, management. However, they are not specifically targeted at COVID-19 or pandemics. The influence of COVID-19, environment, and climate goals are closely related and are included in the MICROBE learning material and MOOCs development. Personalized MOOC Modules, the MICROBE Method, and the system will analyse relationships between COVID-19, environment, and climate change aspects on the world-wide scale.

Currently, many countries face many challenges and needs for the housing improvements that need to be solved. Micro-, mezzo- and macro-environments in housing pertinent to COVID-19 involves numerous aspects. Working from home is on an upswing; thus, suitable environments must be enabled. COVID-19 is bound to bring new requirements to future homes. These will involve resource-efficient throughout a building's life-cycle, larger lots along with smart bathrooms and bidets. There will be new aspects to multigenerational homes, which will now require unique spaces, such as those designed for package delivery. Future homes cannot be simply smart homes — they must be healthy and energy-efficient homes. Floor plans will contain less open space. Creative locales within home can be designed for office use. Management teams will be designated for infrastructural facilities and different, smaller teams for technical facilities. Daily hygienic needs must be on-site in simplified designs. Checklists must be generated for daily health and safety needs. BIM and other digital means need to fight with COVID 19, e.g., by digital risk monitoring on construction sites and in work sites. Relevant systems would include data analysis, alerting, video surveillance, IoT and non-invasive temperature monitoring. Plans should include reporting on health on a daily basis and the ability to diagnose remotely. Proptech would change facilities management on a step-by-step basis by employing workplace wellbeing, efficient energy consumption, optimal use of available space and data management.

Depending on the coronavirus situation and educational needs, the MICROBE MOOC modules can focus on the following topics (United Nations 2020, Chevallier, Enders 2020, OECD 2020a,b, Kennedy 2020, CHEC 2020, Ekberg 2020, Abbott et al. 2018, Oxford Martin Programme... 2020):

- Redesign of public spaces to adapt to the uncertainties:
 - adaptive reuse;
 - suburban revival;
 - rebuilding plans;
 - accelerated technologies use;
 - o redesigning streets.
- Social, personal and contextual behaviour change and its stages.
- Behaviour change at macro, mezo and micro levels.
- Behaviour change design wheel implementation.



- City policy responses to COVID-19:
 - Social distance and confinement;
 - Workplace practices and commuting patterns;
 - Targeted measures for vulnerable groups;
 - Local service delivery;
 - Support to business and economic recovery;
 - Communication awareness raising and digital tools;
- Sustainable development with respect to COVID-19:
 - No poverty. Loss of income, leading vulnerable segments of society and families to fall below poverty line.
 - Zero hunger. Food production and distribution could be disrupted.
 - Good health and well-being. Devastating effect on health outcomes.
 - Quality education. School for many closed; remote learning less effective and not accessible for some.
 - Gender equality. Women's economic gains at risk and increased level of violence against women. Women account for majority of health and social care workers who are more exposed to COVID-19.
 - Clean water and sanitation. Supply disruptions and inadequate access to clean water hinder access to clean handwashing facilities, one of the most important COVID-19 prevention measures.
 - Affordable and clean energy. Supply and personnel shortages are leading to disrupted access to electricity, further weaking health system response and capacity
 - Decent work and economic growth. Economic activities suspended; lower income, less work time, unemployment for certain occupations.
 - Sustainable cities and communities. Population living in slums face higher risk of exposure to COVID-19 due to high population density and poor sanitation conditions.
 - Climate action. Reduction commitment to climate action; but less environmental footprints due to less production and transportation.
 - Pease, justice and strong institutions. Conflicts prevent effective measures for fighting COVID-19; those in conflicts areas are most at risk to suffering devastating loss from COVID-19.
 - Partnership for the goals. Aggravate backlash against globalization; but also highlight the importance for international cooperation on public health.
- COVID-19 Framework. The purposes of the COVID-19 Framework is to inform national, multilateral and global responses and to shape the recovery response and future recommendations – with an emphasis on Building Back Green and strengthening Public Health as a key component of health systems.
- COVID-19 impact, relief measures and possible long-term distortions.
- Analytics tolls (economic modelling, machine learning, predictive analysis, network analysis, system dynamics, quantitative analysis) and trade (leverage trade and investment agreements, evaluation and monitoring performance, supply chain management, competitive benchmarketing, support C-Level execs in global strategy, map market access).
- Supply chain resilient to the current pandemic situation.
- Measures to combat COVID-19 by hindering its propagation and by reducing its effects.



2.5 Educational gaps

What are the gaps in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment (please list up to 5 major gaps at country level):

Most educational institutions around the world cancelled in-person instruction and moved to remote learning and teaching in March 2020 in an attempt to contain the spread of COVID-19. Parts of the (or the whole) formal education system will not re-open this academic year in some countries, whereas in others (parts of) the formal education system have progressively re-opened (Di Pietro et al. 2020).

Although the adoption of distance learning is key to ensure the continuity of education following the physical closure of schools, students are, on average, likely to experience a learning loss during the lockdown. Several arguments can be put forward to explain this. First, there is evidence showing that quarantined students tend to spend less time in learning compared to when schools are open. Second, many students confined at home due to COVID-19 may feel stressed and anxious, and this may negatively affect their ability to concentrate on schoolwork. Third, physical school closure and the lack of in-person contact may make students less externally motivated to engage in learning activities. 'Conservative' estimates for France, Italy and Germany suggest that students will suffer a weekly learning loss of between 0.82 and 2.3% of a standard deviation. Such loss reflects the reduction in test score students would be experiencing because of less time spent in learning compared to the amount of time they typically invest when they are in school. For a test which is scaled to have a mean of 500 and a standard deviation of 100, the implied learning loss over the whole period of lockdown would mean a reduction in scores of between 6.5 and 14 points (Di Pietro et al. 2020).

The learning loss, in the short and long term, is expected to be great. Researchers in Canada estimate that the socio-economic skills gap could increase by more than 30 per cent due to the pandemic. The World Bank identifies three possible scenarios for the loss of learning: a reduction in average learning levels for all students, a widening of the distribution of learning achievements due to highly unequal effects of the crisis on various populations, or a significant increase of students with very low level of achievement due in part to massive dropouts. This suggests 25 per cent more students may fall below a baseline level of proficiency needed to participate effectively and productively in society, and in future learning, a result of the school closures only (De Giusti 2020).

Currently, many countries face many challenges and needs for the housing improvements that need to be solved. Micro-, mezzo- and macro-environments in housing pertinent to COVID-19 involves numerous aspects. Working from home is on an upswing; thus, suitable environments must be enabled. COVID-19 is bound to bring new requirements to future homes and urban planning. The urban planning aspects is presented in the table below.

From the current state of urban planning	To a more resilient planning
Predominantly one zone (residential or commercial)	Integrated/Mixed-use markets (if people are going to work more from home, can we think of mixing sectors)
Few open and green spaces	Easier access to open and green spaces

Table 1. Requirements to urban planning.



No or few bike lines	More space for pedestrians on sidewalks, and more and better designed dedicated bike lanes
Low investment in digital infrastructure	Better digital infrastructure across urban and rural both
Inner cities are overcrowded	Potential scenario for suburban revival (city districts, smaller communities)
Urban buzz centralized in city centers	Services coming near to housing
Single use of spaces	A mindset of creating everything as multifunctional. Buildings, green spaces, public space, reads, schoolyards, etc.
Health vulnerabilities are exposed	Focus on a combination of physical health, behavioural health and socio-economic vulnerabilities (knowing different sets of populations in the community)

Measures to combat COVID-19 (Chevallier, Enders 2020):

- By hindering its propagation:
 - By hindering its propagation to self;
 - By hindering its propagation from people to people;
 - By hindering its propagation from things to people.
- By reducing its effects:
 - By mitigating its health effects;
 - By mitigating its economics effects;
 - By mitigating its social effects (e.g., widespread panic and/or civil unrest).

Sustainable development is also important issue in relation with COVID-19, because coronavirus affecting all sustainable development goals (Kennedy 2020):

- No poverty. Loss of income, leading vulnerable segments of society and families to fall below poverty line.
- Zero hunger. Food production and distribution could be disrupted.
- Good health and well-being. Devastating effect on health outcomes.
- Quality education. School for many closed; remote learning less effective and not accessible for some.
- Gender equality. Women's economic gains at risk and increased level of violence against women. Women account for majority of health and social care workers who are more exposed to COVID-19.
- Clean water and sanitation. Supply disruptions and inadequate access to clean water hinder access to clean handwashing facilities, one of the most important COVID-19 prevention measures.
- Affordable and clean energy. Supply and personnel shortages are leading to disrupted access to electricity, further weaking health system response and capacity
- Decent work and economic growth. Economic activities suspended; lower income, less work time, unemployment for certain occupations.



- Sustainable cities and communities. Population living in slums face higher risk of exposure to COVID-19 due to high population density and poor sanitation conditions.
- Climate action. Reduction commitment to climate action; but less environmental footprints due to less production and transportation.
- Pease, justice and strong institutions. Conflicts prevent effective measures for fighting COVID-19; those in conflicts areas are most at risk to suffering devastating loss from COVID-19.
- Partnership for the goals. Aggravate backlash against globalization; but also highlight the importance for international cooperation on public health.

Another important aspect is behavior change. Drivers of behaviour change could be (Abbott et al. 2018):

- Personal (identity and values, self-interest and knowledge, unknown triggers);
- Contextual (surroundings, information architecture, institutional settings)
- Social (social triggers, identification, social norms)

The stages for behavior changes are (Ekberg 2020):

- Pre-Contemplation (unaware of the problem)
- Contemplation (aware of the problem and of the desired behaviour change)
- Preparation (intends to take action)
- Action (practices the desired behaviour)
- Maintenance (works to sustain the behaviour change)

Behaviour Change could be measured on different levels (Abbott et al. 2018):

- At macro level: fiscal measures, guidelines, environmental/social planning, communication/marketing, legislation, service provision, regulation.
- At mezzo level: environmental restructuring, restrictions, education, persuasion, incentivisation, coercion, training, enablement, modeling.
- At micro level: capability (physical, psychological), opportunity (social, physical), motivation (reflective, automatic).

MICROBE MOOCS may also include behaviour change design wheel. The behaviour change design wheel steps are defined below (Oxford Martin Programme... 2020):

- Define goals and measurable objectives;
- Research to identify target group and motivations behind undesired behaviour
- Strategic based on research or evidence of success:
- Behaviour change model
- Prie-test messages
- Determine channels to deliver message
- Determine useful partnership
- Develop theory of change and determine indicators of success
- Record indicators of success throughout project implementation
- Evaluation to determine of goals have been achieved.



3 POLICIES RELEVENT TO HIGHER EDUCATION, AND THEIR RELATIONSHIP WITH HUMAN BEHAVIOUR ON INFLUENCE OF CORONAVIRUS AND NEGATIVE EMOTIONS IN A BUILT ENVIRONMENT

This section examines the illustrative policy and planning issues relevant to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment. Please answer following questions.

3.1 Policy and planning

Please describe policy and planning issues currently being addressed by the HEI in the field of integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment.

Epidemics have transformed our built environment because of the fear of infection. The current health crisis should develop our built environment to increase the security layers that help to prevent the spread of infections and diseases. In this context, there are multiple areas of research needed regarding COVID-19 (Fig. 2.) (CGTN 2020). From the temporary breakdown of global supply chains to the hollowing out of once bustling city streets, COVID-19 has caused a seismic change in the way we navigate our urban environments. COVID-19 has brought with it many state-sanctioned directives for how European city-dwellers must navigate their built environment. The pandemic has painfully highlighted the cracks in parts of the urban infrastructure on a continent where people spend on average 90 percent of their time indoors even though nearly one in five Europeans live in overcrowded dwellings (CGTN 2020).

Few examples highlighting redesign of public spaces to adapt to the uncertainties

- Adaptive reuse. Austria, Canada, Spain, Sweden, US, UK: convention centers, hotels, sports facilities, dormitories converted to temporary medical facilities and shelters for homeless.
- Suburban revival. US: People moving back to (suburbs) as work from home trend is going on.
- Rebuilding plans. Paris: plans a 15 minute city underpinning a self-sufficient community. Amsterdam: using a doughnut model to seek what is needed by people to thrive without harming economy.
- Accelerated technologies use. South Korea: tracing apps helped South Korea track many cases indicating digital technology integration with resilience.
- Redesigning streets. US: parking lots being used by restaurants to ease virus restrictions. New Zealand: funding Pop-up bike lanes and widening sidewalks.

COVID-19 is bound to bring new requirements to urban planning. The urban planning aspects is presented in the table 1.



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Commonwealth Human Ecology Council endorsed the InterAction Council COVID-19 Framework. The COVID-19 Framework purposes are (CHEC 2020):

- To inform national, multi-lateral and global responses to address the COVID-19 Pandemic now, with a view to enhancing co-ordinated global, regional and national responses; the framework provides a comprehensive multi-sector response that can potentially be adapted for national and multi-lateral planning processes.
- To shape the recovery response and future recommendations with an emphasis on Building Back Green and strengthening Public Health as a key component of health systems. These are intended as initial recommendations to shape the recovery process and stimulate further discussion, and will inform the InterAction Council Plenary session later this year.

The COVID-19 Framework also includes initial recommendations for future pandemics and emergency responses. The eight recommendations show areas where things can be improved moving forward. The recommendations are (CHEC 2020):

1. Build Back Green – as part of the recovery process, invest in solutions that address the climate crisis and enable progress towards the Sustainable Development Goals including: nature based solutions, renewable energy, low carbon infrastructure, climate change adaptation.

2. Enable the Digital Transformation – continue the rapid digital shift during the pandemic to create connected communities that are able to share learning, find solutions and respond at scale to building back green; ensure digital governance to prevent misinformation, hacking and scams; and enhance efficient ways of working, with reduced travel, with the creation of digital health systems for Planet, Place and People for a common future for all.

3. Courageous and Collaborative Leadership – for the wellbeing of future generations, in order to apply learning from the pandemic, re scaling up emergency processes and unified efforts to address the climate and environmental crisis; empower young people with the skills and experience required to address emergencies and to secure a healthy planet for all.

4. Establish an Independent Global Emergency Mechanism – tasked with enhanced surveillance and monitoring, risk assessment and detection, with rapid alert and response systems; such an organisation needs to be able to establish a global and multi-sector response at speed, communicate freely, have independent governance and be able to collaborate and mobilise action across the international community.

5. Invest in Emergency Preparedness and Response – the Commission for a Global Health Risk Framework for the Future recommends an annual global investment of \$4.5 billion for pandemic preparedness, including public health preventative measures and research. Such an organisation could have wider responsibilities, including relevant aspects to address the Planetary Emergency.

6. Strengthen Public Health and Health Protection – invest in and enhance essential public health operations and services within every country– a weak link anywhere is a weak link for us all – ensure that this is embedded within national health systems to enable national, regional and local coordination and surge capacity during outbreaks.



7. Enhance links with multi-sector emergency mechanisms – ensure that health risks and planning, including for pandemics are incorporated across global, national, regional and local emergency planning systems and governance mechanisms – building upon the Sendai Framework for Disaster Risk Reduction.

8. Increase Research into Prevention and Preparedness – the Commission for a Global Health Risk Framework for the Future recommends an annual global investment of \$1 billion for research into pandemic preparedness; investing in research on the effectiveness of preventative and health protection measures provides the most scope for reducing avoidable deaths, whilst maximising economic savings, and reducing global security impacts.

Construction strategies used in healthcare systems during the pandemic is presented by Megahed, Ghoneim (2020). Researchers suggest using modular constructions, adaptive reuse and lightweight architecture:

- Modular constructions. Increasingly popular before COVID-19, the modular construction strategy is effective to face pandemics or natural disasters and to create less expensive and more quickly constructed buildings. It is important for meeting health services' diverse requirements with prefabricated standardized components. These components could help buildings adapt to requirements or enlarge their spaces for treatment and quarantine.
- Adaptive reuse. This strategy is a sensitive and sustainable approach to create emergency facilities. During a pandemic, sports facilities, parking lots, and other buildings are converting into medical facilities and temporary hospitals. There will be a requirement for more efficient, effective, and flexible reuse plans for future crises. This strategy is beneficial when integrated with other advanced technologies in the construction sector.
- Lightweight and adaptable structures. When responding to the pandemic, lightweight and adaptable structures are often preferable for their speed and portability. Designers are developing and assembling these temporary structures to create field hospitals that can be easily transported and erected for COVID-19 patients.

Architectural and urban spaces, as they relate to infectious disease epidemics, are not only about quarantine based on immediate and precautionary measures but also refer to design and planning problems and challenges in all building types and urban spaces as illustrated in Fig. 1. The pandemic of COVID-19 has caused serious consequences that can be an opportunity to review individual and collective choices and priorities. Most architecture today shows evidence of how humans have responded to infectious diseases by redesigning our physical spaces (Megahed, Ghoneim 2020).

Given the current situation in the field of HEI, there is a significant lack of modules for stakeholders to acquire the knowledge and skills needed to plan the built environment during a pandemic.

Education

With the further spread of COVID-19 infection, in 2020 December 14 The Government of the Republic of Lithuania announced the quarantine and the Coronavirus Prevention Group decided that all activities at the university should be continued remotely until 31 January.

2020 August 17 No. V-1837 The Minister of Health of the Republic of Lithuania issued a decision "On the Prerequisites for Higher Education, Vocational Training and Non-Formal Adult Education"

Urban planing



The Ministry of Environment of the Republic of Lithuania informs that a new general plan of the territory of the Republic of Lithuania is currently being prepared, which integrates sustainable development and urban planning by 2030.

Negative emotions

The Ministry of Health of the Republic of Lithuania has prepared a plan on how to mitigate the impact of coronavirus on mental health.

The ROCK project team of Vilnius City Municipality and Vilnius Gediminas Technical University (Vilnius Tech) evaluates the quality of services in Vilnius Municipality through emotions (<u>https://vilnius.lt/lt/2020/02/03/naujove-is-ateities-paslaugu-kokybe-vilniaus-savivaldybe-vertins-per-emocijas/</u>)

3.2 Gaps in policy and planning

Please describe other, if any, policy issues that are not currently being handled by the HEI but should be considered.

N/A

N.B. The responses to these questions do NOT require describing each policy and planning issue but only the identification of the type of issues being addressed and those not being addressed. The questions are only meant to understand the scope of coverage of important issues by the HEI.

4 CAPACITY TYPES (Universities answer all points. Italy and Bulgaria give answers optionally)

This section aims at assessment of the existing state of capacities in the HEI for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment. As defined by the CAPNAM analytical framework, the four types of categories are institutional, organizational, individual, and the knowledge base.

4.1 Institutional capacities

This part describes the institutional capacities at HEI level. Please answer following questions.

1. Please provide brief presentation of the HEI.

Vilnius Gediminas Technical University is a leading higher education institution located in the heart of the Baltic region in Vilnius, Lithuania. Established in 1956 Vilnius Tech currently has over 9 600 students and carries out studies at 10 faculties: Antanas Gustaitis' Aviation Institute, Architecture, Business Management, Civil Engineering, Creative Industries, Electronics, Environmental Engineering, Fundamental Sciences, Mechanics, Transport Engineering. Research is carried out at 13 research institutes, 3 research centres and 22 research departments. The University has a longterm experience in international research and studies projects and has a tradition of teaching in English. 112 study programmes based on three-cycle structure: undergraduate (BSc), graduate



(MSc) and post-graduate (PhD) studies. 29,5% of Vilnius Tech study programmes are taught in English. Vilnius Tech is the leader in Lithuania by the number of students, studying abroad and the teaching staff teaching abroad under the Erasmus+ Programme. Having more than 500 foreign HEIs partners, Vilnius Tech offers good opportunities for wide international studies and internship. The institution holds the Erasmus Charter for Higher Education 2014-2020. The Quality Management System has been currently introduced, as well as the Key Performance Indicators (KPI), which help measure the academic staff's performance in research and study projects, scientific papers, teaching abroad, other international activities, etc. Vilnius Tech has coordinated and participated in international programmes, including EU-Asia-link, ALFA III, Tempus, ERASMUS+, Framework 6-7, H2020, Eureka, etc. Vilnius Tech is a partner or coordinator of about 30 international educational projects and over 20 international research projects.

- 2. Please describe general model of studies according to different levels (bachelor, master, PhD).
 - Bachelor studies 4 years (240 ECTS);
 - Master studies 1,5 years (90 ETCS), 2 years (120 ETCS);
 - PhD 4 years (240 ETCS)

3. Please provide key facts and figures about the HEI:

3.1. Number of students: Over 9 400 students (13,5% international – degree seeking or exchange)

3.2. Number of academic staff: 960 academic staff members (67% with PhD degree)

3.3. Student/Academic staff ratio: 10:1 Student/Academic staff ratio

3.4. Number of Faculties (please specify): 10 faculties: Antanas Gustaitis' Aviation Institute, Architecture, Business Management, Civil Engineering, Creative Industries, Electronics, Environmental Engineering, Fundamental Sciences, Mechanics, Transport Engineering

3.5. Number of graduates: 1900

3.6. Number of study programmes: 110 study programmes based on three-cycle structure: undergraduate (BSc), graduate (MSc) and post-graduate (PhD) studies

3.7. Number of international academic partners: Over 450 partner higher education and research institutions in 67 countries

3.8. International rankings of the HEI (if any): QS Global World Ranking: 591–600,

VILNIUS TECH is ranked 32nd in the Emerging Europe and Central Asia region according to the "QS World University Rankings 2020".

4. Please describe main education and research areas of the HEI.

- 1316 scientific publications;
- 31 defended PhD degrees;

Research focus:

- Sustainable building
- Environmental and energy technologies
- Sustainable transport
- Mechatronics
- Information and communication technologies
- Fundamental research on materials and processes
- Economics Engineering, management and communication



5. Is there any strategic priorities given to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment at HEI level? Please specify.

Strategic priorities given to integrated education in Vilnius Tech:

- 1. Sustainable construction (advanced building constructions, environmentally friendly building materials and technologies, architecture and urban environment, digital modeling of buildings and sustainable life cycle, geodetic technologies)
- 2. Environmental and energy technologies (efficient use of resources and energy, environmental technologies, building energy, renewable energy)
- 3. Information and communication technologies (artificial intelligence and decision making systems)

However, there are currently no strategic priorities given to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment at HEI level.

6. What are the needs at HEI in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment (please list up to five major needs):

The needs at HEI in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment are:

- New modules in the field of coronavirus and negative emotions in a built environment and these modules integration in existing programmes;
- Funding for researches and modules development;
- Teachers trainings, staff.

7. What are the gaps at HEI in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment (please list up to five major gaps):

The gaps at HEI in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment:

- Integration of human behaviour relevant to the influence of coronavirus and negative emotions in a built environment as a whole;
- Lack of staff;
- Insufficiency of funding for:
 - Researches;
 - Teacher trainings;
 - Curricula development and implementation.
- Insufficiency of knowledge for curricula development and implementation.



4.2 Organisational capacities

This part describes the organisational capacities pertinent to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment at HEI. Please answer following questions.

1. Is integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment sufficiently included in the curricula of HEI? Please specify according to different levels (bachelor, master, PhD):

- 1.1. Study programme level (Please list relevant study programmes): No
- 1.2. Study subject level (Please list relevant study subjects/modules): No
- 1.3. Study topic level (Please list relevant study topics): No

According to the search for coronavirus in a built environment in other universities' MSc programmes, no similar study programs and modules were found.

Lithuanian universities do not have BSc or MSc study programs or separate disciplines on COVID-19.

2. Is funding sufficient for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment at HEI? Please specify.

No. The university has many ongoing, funded research projects which target built environment analysis at micro, meso and macro levels. However, such an integrated project, which considers human behaviour relevant to the influence of coronavirus and negative emotions in a built environment as a whole, is being funded for the first time.

3. What are the needs at HEI in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment related to organisation of study process (please list up to five major needs):

The needs at HEI in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment related to organisation of study process are:

- Develop the necessary modules and integrate them into the study program:
- Qualified teachers in this field
- Trainings for teachers and staff.

6. Please list up to five major gaps in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment related to organisation of study process:

The University has modules in the field of built environment that provide analysis at the micro, meso and macro levels, but there is no integrated module covering both the built environment and urban



development, as well as pandemic and human behavior and negative emotions. Furthermore, there is also a gap in:

- Time for preparation,
- Teachers and staff trading,
- Researches funding.

4.3 Individual capacities: Staff skills

This part describes the individual staff capacities pertinent to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment at HEI. Please answer following questions.

1. How many academic staff works at your unit? (which implements the project): 5

2. Is there sufficient number of teachers who specialise in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment? How many?

- 2.1. At university level: 2
- 2.2. At your unit/department: 2

The University has modules in the field of built environment that provide analysis at the micro, meso and macro levels, but there is no integrated module covering both the built environment and urban development, as well as pandemic and human behavior and negative emotions.

3. Is there sufficient number of researchers who specialise in human behaviour relevant to influence of coronavirus and negative emotions in a built environment? How many?

- 3.1. At university level: 3
- 3.2. At your unit/department: 3

4. Please describe the current state of the staff training in HEI. Is it sufficient?

The university has many staff trainings which target built environment analysis at micro, meso and macro levels.

5. Please describe the current state of the staff training on human behaviour relevant to influence of coronavirus and negative emotions in a built environment. Is it sufficient?

No. The university has many staff trainings which target built environment analysis at micro, meso and macro levels. However, such an integrated project, which considers human behaviour relevant



to the influence of coronavirus and negative emotions in a built environment as a whole, is being funded for the first time.

6. Does the academic staff have flexibility in designing its own skill development plans or does it have to follow a centrally determined package?

The academic staff have flexibility in designing its own skill development plans

7. Is there staff stability, or does it suffer from high turnover among such professionals?

The staff is stable.

8. What staff skills are required for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment (please list up to five major needs):

The required skills for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment are:

- Soft skills, such as communication, flexibility, interdisciplinary team work and time management
- Hard skills, such as ICT, data analytics, affective computing, intelligent desision support systems, etc.

9. Please list up to five major gaps in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment related to staff skills:

The major gaps in integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment related to staff skills are:

- Improvements of soft skills such as communication, flexibility, interdisciplinary team work and time management
- Improvements of hard skills, such as ICT, data analytics, affective computing, intelligent desision support systems, etc.

4.4 Access to Information, Knowledge and Technology

Access to information, knowledge and technology is becoming increasingly critical for sustaining long-term growth and development of education. It relates to the capacity to enable academic staff and students to mobilize, access and use information and knowledge, including access to and effective use of internet. Please answer following questions.



1. Do students and teachers have access to the novel educational resources on human behaviour relevant to influence of coronavirus and negative emotions in a built environment? Please specify:

1.1. Printed learning materials in national language: Yes

1.2. Printed learning materials in English or other languages: Yes

1.3. Online learning materials (open-source videos, simulators (calculators and software), case studies, text material) in national language: Yes

1.4. Online learning materials (open-source videos, simulators (calculators and software), case studies, text material) in English or other language: Yes

The University has modules in the field of built environment that provide analysis at the micro, meso and macro levels, but there is no integrated module covering both the built environment and urban development, as well as pandemic and human behavior and negative emotions. University has developed BECK Centre, which is used in the study process: <u>http://beck-erasmus.com/index.php/beck-centre/</u>.

2. Does HEI use MOODLE for educational purposes?

University use MOODLE and BECK Centre (<u>http://beck-erasmus.com/index.php/beck-centre/</u>) for education purposes. The BECK Centre is composed of adaptive MOOCs, computer learning systems, affective tutoring system, Big Data mining, adaptive examination system, adaptive biometric examination system.

3. Does HEI use computer-based intelligent systems, MOOCs, computer learning systems, big data mining for educational purposes? Please specify:

Yes, the BECK Centre (<u>http://beck-erasmus.com/index.php/beck-centre/</u>) is composed of adaptive MOOCs, computer learning systems, affective tutoring system, Big Data mining, adaptive examination system, adaptive biometric examination system.

4. Does HEI use software for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment? Please specify:

The University use the software in the field of the built environment, emotions analytics, urban planning, etc. But there is no integrated software platform for the analysis of human behaviour relevant to the influence of coronavirus and negative emotions in a built environment as a whole.

5. What Information/Knowledge/Technology is required for integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment (please list up to five major needs):



Information/Knowledge/Technology requirements:

- Soft skills and hard skills
- Integration of different research areas: built environment, urban planning, human behavior, emotions analytics.
- Integration of adaptive MOOCs, computer learning systems, affective tutoring system, Big Data mining, adaptive examination system, adaptive biometric examination system in the study process.

6. Please list up to five major gaps in access to information, knowledge and technology pertinent to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment:

The major gaps in access to information, knowledge and technology pertinent to integrated education on human behaviour relevant to influence of coronavirus and negative emotions in a built environment

- Lack of soft skills and hard skills;
- Lack of training;
- Integration of different research areas: built environment, urban planning, human behavior, emotions analytics.
- Lack of implementation of the latest technologies (adaptive MOOCs, computer learning systems, affective tutoring system, Big Data mining, adaptive examination system, adaptive biometric examination system) in the study process.



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