

Co-funded by the Erasmus+ Programme of the European Union

# 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

Report prepared by: Tallinn University of Technology, Estonia



1	Introduction				
2	С	ntext			
	2.1	Socio-political and cultural context			
	2.2	Status of education			
	2.3	Funding7			
	2.4 Educational needs				
	2.5	Educational gaps			
3	3 Policies relevent to higher education, and their relationship with human behaviour on influence				
of coronavirus and negative emotions in a built environment					
	3.1	Policy and planning11			
	3.2	Gaps in policy and planning14			
4 (		apacity types			
	4.1	Institutional capacities			
	4.2	Organisational capacities			
	4.3	Individual capacities: Staff skills 19			
	4.4	Access to Information, Knowledge and Technology			
5	R	eferences			



#### **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

According to Worldmeter (2021), total coronavirus cases in Estonia are 52 827, deaths - 501, recovered - 41 461 as of the date of 15.02.2021. Estonian Government has set a target to hold down the number of infection cases to 500 per day. Figures 1 and 2 show the linear trajectory for Estonian coronavirus cases.



Fig. 1. Total coronavirus cases in Estonia (Worldmeter, 2021) as of the date of 15.02.2021



Fig. 2. Total coronavirus deaths in Estonia (Worldmeter, 2021) as of the date of 15.02.2021



The first lockdown and the beginning of distance learning for educational institutions (hobby clubs, kindergartens, schools, universities) is dated 16th of March, 2020. As of 25th January 2021, contact learning has been permitted on all levels on educational institutions. We have now faced a year of rapid disruption of the way we live, learn and work.

Estonian Government has initiated a separate web-portal <u>https://www.kriis.ee/</u> (available in Estonian, English and Russian languages) to collect and disseminate updated information concerning COVID-19 spreading situation and restrictions that apply locally.

#### 2.1.1 HOIA mobile app

It was decided that additional help is needed with tracing the infected contacts and the Health Board has a team tasked with calling everyone infected with the coronavirus, finding out with whom they were in close contact and in turn informing those close contacts about a possible infection. This work is very important to limit the transmission of the infection, but it has certain natural shortcomings. Not every infected person may be able to remember all the people they were in close contact with: some people tend to forget and some cannot easily identify them. For example, most people do not know who they were sitting next to on a bus. Therefore, HOIA (https://hoia.me/) creates significant added value to the work of the Health Board, as it can also identify those close contacts that the infected person does not know or remember.



#### Fig. 3. HOIA mobile app functioning scheme (<u>https://hoia.me/</u>)

Viruses such as COVID-19 can spread before symptoms occur, therefore, an infected person may spread the disease without the knowledge of themselves and others. This means that by the time the symptoms appear, the virus may have already spread to others, and it is not enough for symptomatic people to stay at home to stop the virus from spreading. Through the HOIA app, an infected person can quickly inform all people with whom they have been in close contact during the infectious period. In this way, the app users can find out about a possible infection early on and take steps to protect themselves and the health of others. By using the HOIA app, you contribute to reducing the number of infections in Estonia, regardless of whether you are infected or in close contact.



#### 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.

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

Estonian universities have various modules on urban planning:

Tallinn University of Technology

- School of Engineering. Department of Materials and Environmental Technology. BSc in Materials and Processes of Sustainable Energetics <u>https://www.taltech.ee/keskkonna-energia-ja-keemiatehnoloogia</u>
- School of Engineering. Department of Material and Environmental Technology. MSc in Environmental Engineering and Management <u>https://taltech.ee/en/environmentalengineering</u>
- School of Engineering. Department of Civil Engineering and Architecture. Tartu College. MSc in Industrial Ecology <u>https://www.taltech.ee/toostusokoloogia</u>
- School of Engineering. Department of Civil Engineering and Architecture. Academy of Architecture and Urban Studies. MSc in Architecture (integrated studies, 5 years 300 ECTS credits) <u>https://www.taltech.ee/en/academy-of-architecture-and-urban-studies</u>
- School of Engineering. Department of Civil Engineering and Architecture. MSc in Structural Engineering and Construction Management (integrated studies, 5 years 300 ECTS credits) <u>https://www.taltech.ee/projekteerimine-juhtimine</u>
- School of Engineering. Department of Civil Engineering and Architecture. MSc in Indoor Climate in Buildings and Water Engineering (integrated studies, 5 years 300 ECTS credits) <u>https://www.taltech.ee/sisekliima-vesi</u>

EKA (Estonian Academy of Arts). MSc in Architecture and Urban Planning (integrated five-year curriculum) <u>https://www.artun.ee/en/curricula/urban-studies/</u>

Maaülikool (The Estonian University of Life Sciences) MSc in Landscape Architecture <u>https://www.emu.ee/en/landscape-architecture</u>

Maaülikool (The Estonian University of Life Sciences) MSc in Environmental Governance and Adaptation to Climate <u>https://www.emu.ee/en/admissions/environmental-governance-and-adaptation-to-climate-change/</u>

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

- Tallinn University <u>https://www.tlu.ee/lti/ba/psyhholoogia</u>
- University of Tartu
   <u>https://www.ut.ee/et/sisseastumine/bakalaureus/oppekavad/psuhholoogia</u>



#### 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):

During the past several months the higher education landscape in Europe, as well as around the world has seen major transformation in many forms - in delivery, assessment and recognition of knowledge and competencies. The sudden changes have affected the lives and realities of many students and it is globally foreseen that a changed blended reality will persist during the upcoming academic year, if not even longer (ESU, 2020).

In 2019 UNESCO launched "the Futures of Education: Learning to Become" initiative with the aim of rethinking education and reimagining how knowledge and learning can shape the future of humanity and the planet. The pandemic has forced a massive shift away from learning and teaching in traditional settings with physical interactions. In the renewal of education, human interaction and wellbeing must be given priority. Technology—particularly digital technology that enables communication, collaboration and learning across distance—is a formidable tool, not a panacea but a source of innovation and expanded potentials.

In consideration of the mandate to reflect on alternative and possible futures, UNESCO's International Commission on the Futures of Education has decided to focus on ways to be helpful at this unprecedented moment in history, one that is causing a severe disruption in educational opportunity around the world. They offer the guidance (UNESCO, 2020) in a spirit of humility and in an effort to illuminate the ethical dilemmas and choices in front of us now.

In addition to the report of the International Commission on the Futures of Education, established by UNESCO in 2019, that have proposed nine ideas for concrete actions today that will advance education tomorrow (UNESCO, 2020), ESU (2020) has organized a webinar series focusing on the possibilities that e-learning offers, assessment in e-learning, as well as the quality and recognition of e-learning. Generally it can be concluded from the webinar series that emergency online learning developed during the pandemic highly differs from 'real', strategically implemented e-learning. Therefore, ESU (2020) wanted to look beyond the pandemic and see which challenges and opportunities come with e-learning and which obstacles need to be overcome in order to sustainably develop e-learning throughout and beyond the next academic year. There are many factors to take into account for successful e-learning - fully or partially (combined with on-site courses):

• students and teachers need to be trained in digital literacy,



- privacy and data protection need to be taken into account,
- accessibility needs to be guaranteed for all and changes need to be made to transfer the feeling of community into an online learning environment.

E-learning and blended learning offer many opportunities for accessibility, lifelong learning and short cycle education, but we need to ensure to find suitable alternatives in terms of social connection, interactivity and student-friendly environments as provided in face-to-face learning.

The European Students' Union (ESU) came up with recommendations for the E-learning process in the academic year 2020-2021.

Universities across Europe are preparing for different scenarios for the 2020-2021 academic year. Only a few of the higher education institutions' plans for the preparation of the upcoming semesters include creating a blended approach for physical campus attendance and virtual learning from home, looking into the quality assurance of this approach, ensure timely communication about this to students, and in short thoroughly developing quality blended learning solutions.

Below, points that are of utmost importance for planning a sustainable and effective use of e-learning in the upcoming semesters are address. Summary of recommendations:

→ Communicate clearly: Communication between all stakeholders is crucial to find common ground and solutions acceptable for all. Constant sharing of information and good practices amongst HEIs is extremely important to make e-learning a success

→ Act for accessibility: Guaranteeing accessibility to all students is the starting point of successful e-learning.

→ Involve students in decision making: Involvement of stakeholders, especially students, already in the planning and policy making process can increase the acceptance and support for elearning.

→ Guarantee privacy and data protection: Privacy and data security should be guaranteed and transparently communicated.

→ Support teachers : Teachers need to be trained and supported to be successful teachers in elearning

→ *Remember co-creation:* Extra efforts should be made to create a lively and open learning community.

→ *Be interactive:* Interactivity with and towards the students is even more important in an online learning environment.

→ Focus on the learning outcomes: It is important to carefully redefine the learning outcomes where needed to ensure they truthfully reflect what students have achieved through their learning.

→ Apply diverse assessment methods: In online learning there are many diferent assessment methods possible. In order for students to truly obtain the learning outcomes defined in the programs multiple assessment methods should be applied.

→ *Remember to do QA:* Quality assurance is key to successful learning and should be applied taking into account the unique elements of e-learning.



→ Start and end with recognition: Recognition procedures should be already taken into consideration during the planning process in order to ensure smooth performance

→ Don't discriminate against the international students : International students should be given equal opportunities to study in a university. As long as they can not physically come to campus, online alternatives have to be offered by the university.

→ Don't call internationalization at home a virtual mobility : mobility comes with diferent challenges and opportunities for students than an online experience. Internationalization at home could therefore not be called mobility.

→ Prepare your support services : Exchange and support structures are essential to promote interactivity and identification of needs for support.

#### 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):

There have been much research conducted on incorporating ICT into the daily educational operations during the pre-Covid situation. The research has shown that thoroughly planned elearning highly differs from simply moving traditional learning to the online world. E-learning should not just be seen as a mere projection of learning through technological tools, but much broader. Rodrigues et al (2019) have conducted a systematic literature review to examine how studies have analyzed the e-learning concept in the last decade (articles analyzed starting from 2010). Researchers propose a recent definition of e-learning:

*E-learning is an innovative web-based system based on digital technologies and other forms of educational materials whose primary goal is to provide students with a personalized, learner-centered, open, enjoyable and interactive learning environment supporting and enhancing the learning processes.* (Rodrigues et al, 2019)

Yen et al (2018) provided a comparison of students' academic outcomes and course satisfaction in face-to-face, online, and blended teaching modalities. The blended modality offers more instructors the ability to transition towards a more technologically-mediated classroom, giving them greater opportunities to continue teaching in face-to-face sessions while also selecting the online teaching practices and features that best serve their students. Faculty can exercise greater flexibility and selectivity in designing blended curricula, ultimately allowing them to optimize their teaching for more students (Yen et al, 2018). However, the institutional challenge of student overpopulation and budgetary constraints must be addressed.

Results showed that students performed equally well across all three teaching modalities, allaying traditional concerns about online and blended teaching efficacy. In addition to demonstrating that online classes can be just as effective as face-to-face classes in producing satisfactory student outcomes. The results also highlight the potential for blended modality classrooms to improve student academic outcomes by combining the best features from both face-to-face and online teaching. The use of three-way comparison showed that quality student learning can occur online, offline, and in between.

In order to meet the needs of a growing student body, respect instructors' needs as educators, expand the definition of "good teaching practice", the institutions can support their faculty by offering more opportunities for professional development, technological proficiency skill-building,



and providing more pedagogical support. As instructors strive to provide the best learning environments for their students, teachers of all types can benefit from technological tools and practices in order to best support learners of all backgrounds (Yen et al, 2018).

During the early months of the year 2020, faculty around the world had to transition their courses online under circumstances that typical online course development does not have to face. Those circumstances were

(1) a need to rapidly, with little to no preparation, transition instruction online;

(2) execute the transition online and subsequent online instruction under traumatic conditions of a pandemic; and

(3) pursue extended online teaching with little to no information regarding if this transition to online teaching will be temporary or more permanent.

Cutri et al. (2020) assert that these three factors constitute crisis online course transitioning and teaching as opposed to conventional online course transitioning and teaching.

The pandemic also puts under threat the international dimension of education. According to the <u>SchengenVisaInfo.com</u> survey results, 30% of the respondent students said they would cancel their studies in Europe if the online learning is to be chosen as the delivery mode and 22.3% said that they probably would cancel their studies<sup>1</sup>. These numbers highlight that the international study experience can't be replaced by internationalization from home strategies, students need physical mobility and even during these challenging times the international dimension of university education should not be compromised.

In response to challenges posed by technological transformations, some schools implemented learning management systems such as e-learning that led to the transition from a traditional learning model to a more innovative and flexible one that allows students to learn in a pedagogical but recreational environment.

However, the successful adoption of e-learning requires adequate infrastructures, an ability to accept change, appropriate digital skills and a suitable program design which meets the students' learning needs. According to the 2018 NMC Horizon Report, it is crucial to provide students with experiences that teach them how to deal with real-world problems and with tools that make them better prepared to solve unexpected problems. This report also draws attention to the relevance of the following topics:

(a) a deep understanding of digital environments, a responsible and appropriate use of technology,

(b) a redefinition of educational roles and institutional hierarchy of organizations,

(c) an equitable access to the broadband internet and (d) increased financial aid to educational institutions.

In short, the process of e-learning adoption requires above all Cutri et al. (2020):

(a) growing acceptance of innovation cultures, including technology as a working tool and a proliferation of open educational resources,

(b) the redesigning of learning spaces,

(c) the introduction of new ways of measuring learning,

<sup>&</sup>lt;sup>1</sup> <u>https://www.schengenvisainfo.com/news/52percent-of-international-students-very-likely-to-cancel-studies-in-europe-if-they-have-to-take-classes-online/</u>



(d) a redefinition of educational roles, and

(e) the implementation of online learning programs with a design oriented to meet students' educational needs.

#### 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.

#### COVID-19 and the impact of built environment (BE) in transmission.

The built environment (BE) is the collection of environments that humans have constructed, including buildings, cars, roads, public transport, and other human-built spaces. Since most humans spend 90% of their daily lives inside the BE, it is essential to understand the potential transmission dynamics of COVID-19 within the BE ecosystem and the human behavior, spatial dynamics, and building operational factors that potentially promote and mitigate the spread and transmission of COVID-19. BEs serve as potential transmission vectors for the spread of COVID-19 by inducing close interactions between individuals, by containing fomites (objects or materials that are likely to carry infectious diseases), and through viral exchange and transfer through the air. The occupant density in buildings, influenced by building type and program, occupancy schedule, and indoor activity, facilitates the accrual of human-associated microorganisms. Higher occupant density and increased indoor activity level typically increase social interaction and connectivity through direct contact between individuals as well as environmentally mediated contact with abiotic surfaces (i.e., fomites). (Dietz et al, 2020)

When the World Health Organization (WHO) declared the fast-spreading COVID-19 as a pandemic, citizens around the globe hastened to go home. This global pandemic significantly influenced our personal and professional lives and has a direct bearing upon the very foundations of urban planning and architecture theory and practice. Consequently, the pandemic has led to questions of how architects and planners could present and install antivirus-related ideas or update the existing spaces, as well as at what stage can the pandemic affect our physical and built environment. To extend the scope of research needed from the academic community, Table 1 reviews certain required research areas affected by COVID-19 and highlights their related questions. Professional and extensive research is required on all levels and scales in these areas to prevent the virus from spreading. The answers to these questions could help in predicting the post-pandemic style and visualizing the required antivirus system.



Scope	Research Areas  Digital transformation and telecommuting Centralization and decentralization Density of cities Walking, cycling, and public transportation	Research Questions	
Post-pandemic urbanism		<ul> <li>The COVID-19 crisis has changed the face of many of our cities and questioned how we should manage urban life in the wake of a pandemic. Would the pandemic inspire more urban improvements? Can we design cities that reduce infections? Would the post-pandemic era generate new urbanism based on social distancing? More specifically, could COVID-19 be a catalyst for decentralization and walkable cities?</li> </ul>	
Post-pandemic public spaces	<ul> <li>Design, use and perceptions</li> <li>Design and disease transmission</li> <li>Street design and furniture</li> <li>Shared facilities and services</li> <li>Flexibility and transformation</li> </ul>	<ul> <li>There is no doubt about how COVID-19 will impact future public buildings and spaces. However, how long will these impact and reflection last for future? What about their furniture materials, shared facilities and services? What is the future of commercial buildings? Can air- conditioned shopping malls continue? Will the pandemic teach us new lessons to incorporate into our public buildings and spaces designs?</li> </ul>	
Post-pandemic housing	<ul> <li>Housing layout</li> <li>Space and density</li> <li>Shelter and safety</li> <li>Indoor air guality</li> </ul>	<ul> <li>What is the future of our houses? Should they adapt to better accommodate workspaces? Should they be self-sufficient? Should our terraces, balconies, and roofs be planted? More specifically, could COVID-19 be a catalyst for healthy housing and sustainable buildings?</li> </ul>	
Post-pandemic office space	<ul> <li>Layout and design solutions</li> <li>Working and waiting spaces</li> <li>Shared facilities and services</li> <li>Density in offices</li> <li>Building heights</li> </ul>	<ul> <li>What is the future of co-working spaces and open-plan offices? Could COVID-19 alter their design? Would they need new design criteria? What is the future of high-rise buildings? Can skyscrapers continue? What happens when nobody wants to use elevators?</li> </ul>	
Building and construction technology	<ul> <li>Modular construction</li> <li>Prefabricating standardized components</li> <li>Lightweight and adaptable structures</li> <li>Artificial intelligence</li> </ul>	<ul> <li>What is the future of construction strategy? Could COVID-19 alter its techniques? Should we adopt a more modular construction strategy? If so, will the future witness more prefabricating and standardized components? Could the pandemic speed up the digitalization and automation of our cities? Will our smart devices control everything around us?</li> </ul>	

Table 1. Post-coronavirus architecture and urbanism: Research areas and questions (Megahed and Ghoneim, 2020).

Megahed and Ghoneim (2020) argue that we must install an antivirus-built environment that incorporates a multi-layered approach of protection into its defense system. Architects and planners should design our built environment such as to stop the virus from spreading by creating an antivirus-enabled paradigm. This paradigm must improve new tools, options, and strategies that are more flexible, holistic, and responsive to better address the pandemic response at all levels and scales from interior design to city planning. Based on the lessons learned from this crisis, Fig. 4 shows the proposed vision about how nature and advanced technology approaches help in visualizing antivirus-built environments to stop the virus from spreading. However, selecting the best antivirus strategy depends on many factors, posing new challenges to choose that could be used or planned as long-term reforms. We must be proactive, not reactive, and continue to update this antivirus-enabled paradigm and install new approaches within its framework.



Figure 4. The proposed vision about the future of the antivirus-built environment (Megahed and Ghoneim, 2020)



#### Emotions and wellbeing of the students during the pandemic crisis.

In these times of rapid change and disruption, such as we experienced with the COVID- 19, HE institutions have an obligation to their staff to promote innovation by supporting them in the transition period (Naylor and Nyanjom, 2020).

Aristovnik et al (2020) conducted a comprehensive and large-scale study to date on how students perceive the impacts of the first wave of COVID-19 crisis in early 2020 on various aspects of their lives on a global level. With a sample of 30,383 students from 62 countries, the study reveals that amid the worldwide lockdown and transition to online learning students were most satisfied with the support provided by teaching staff and their universities' public relations. Still, deficient computer skills and the perception of a higher workload prevented them from perceiving their own improved performance in the new teaching environment. Students were mainly concerned about issues to do with their future professional career and studies, and experienced boredom, anxiety, and frustration. The pandemic has led to the adoption of particular hygienic behaviours (e.g., wearing masks, washing hands) and discouraged certain daily practices (e.g., leaving home, shaking hands). Students were also more satisfied with the role played by hospitals and universities during the epidemic compared to the governments and banks. The findings also show that students with certain socio-demographic characteristics (male, part-time, first-level, applied sciences, a lower living standard, from Africa or Asia) were significantly less satisfied with their academic work/life during the crisis, whereas female, full-time, first-level students and students faced with financial problems were generally affected more by the pandemic in terms of their emotional life and personal circumstances.



Figure 5. Emotions most frequently expressed by students during the COVID-19 pandemic (% of students who felt emotion often or always).

The quick and radical changes in teaching and learning processes have produced significant consequences for students' mental health, i.e., feeling specific emotions and worries. The analysis of the emotions felt by the students showed they were frequently feeling bored, anxious, and frustrated, but also hopeful and joyful.



In order to protect students' mental health as effectively as possible, governments, health professionals, higher education institutions, student organizations, and NGOs should all collaborate intensively on the process of designing timely and efficient psychological and financial support services for students.

#### 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.

Tallinn University of Technology (TalTech) is a public University, was established in 1918. The university is composed of the following schools: 1) School of Information Technologies; 2) School of Engineering; 3) School of Science; 4) School of Business and Governance and Estonian Maritime Academy, has 20 Departments, incl. Tartu College, Virumaa College and IT College.

Tallinn University of Technology (TalTech) is the only flagship in engineering and IT science and education in Estonia, providing higher education at all levels in engineering and technology, information technology, economics, science, and maritime. TalTech's mission is to be a promoter of science, technology, and innovation and a leading provider of engineering and economic education in Estonia.

2. Please describe general model of studies according to different levels (bachelor, master, PhD).

The duration of studies in the curricula is the following:

- the nominal duration of bachelor's studies is three years and the workload of studies is 180 ECTS credits
- the nominal duration of professional higher education is three to four years and the workload of studies is 180–240 ECTS credits



- the nominal duration of master's studies is up to two years and the workload of studies is 60–120 ECTS credits.
- the nominal duration of integrated studies is five years and the workload of studies is 300 ECTS credits
- the nominal duration of doctoral studies is four years and the workload of studies is 240 ECTS credits.
- 3. Please provide key facts and figures about the HEI (as of 2019):

3.1. Number of students: Over 10 282 students (2 108 international – degree seeking or exchange from 100 differeny countries)

- 3.2. Number of academic staff: 987 academic staff members (73 occupy tenure posts)
- 3.3. Student/Academic staff ratio: 10:1 Student/Academic staff ratio
- 3.4. Number of Faculties (please specify):

The university is composed of the following schools: 1) School of Information Technologies; 2) School of Engineering; 3) School of Science; 4) School of Business and Governance and Estonian Maritime Academy, has 20 Departments, incl. Tartu College, Virumaa College and IT College

- 1) School of Information Technologies: Department of Computer Systems, Department of Software Science, Department of Health Technologies, Thomas Johann Seebeck Department of Electronics, IT College.
- 2) School of Engineering: Department of Civil Engineering and Architecture, Department of Electrical Power Engineering and Mechatronics, Department of Energy Technology, Department of Materials and Environmental Technology, Department of Mechanical and Industrial Engineering, Tartu College, Virumaa College, Estonian Centre for Engineering Pedagogy.
- 3) School of Science: Department of Geology, Department of Chemistry and Biotechnology, Department of Cybernetics, Department of Marine Systems.
- 4) School of Business and Governance: Department of Economics and Finance, Ragnar Nurkse Department of Innovation and Governance, Department of Law, Department of Business Administration, Centre for Language and Communication.
- 5) Estonian Maritime Academy
- 3.5. Number of alumni: 72 627 (foreign alumni 2 108)

3.6. Number of study programmes: 81 study programmes (30 international study programmes)

3.7. Number of international academic partners: the university had cooperation agreements with 536 partner universities from all over the world. TalTech has the largest number of collaborative links with universities in Finland, Sweden, Germany and France, reflected in academic mobility, co-publications and a number of cooperation projects.

3.8. International rankings of the HEI (if any): QS Global World Ranking: 601 (as of 2019),

- 4. Please describe main education and research areas of the HEI.
  - 1 289 scientific publications in 2019;
  - 66 defended PhD degrees in 2019;

Research focus:

- 1. Smart and energy-efficient environments
- 2. Dependable IT solutions



- 3. Valorisation of natural resources
- 4. Future governance
- 5. Innovative SME-s and the digital economy

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.

1. Smart and energy-efficient environments – R&D focusing on the creation, development and application of internationally breakthrough smart and energy-efficient (artificial) environments in areas important to the Estonian economy. The goal of the application is to enhance value creation and international competitiveness of the private sector (including industry) through innovative ICT-based and energy-efficient engineering solutions. 2. Dependable IT solutions – reliable and attack-resistant IT systems and services, sustainable development of critical IT infrastructure, energy-efficient IT systems and data processing methods. Trust and confidence of users and society in the IT services and guaranteeing

3. Valorisation of natural resources – innovative solutions for economical and sustainable use of Estonian land, natural resources and man-made resources. 4. Future governance – R&D focused on technological change (in particular the development and uptake of ICT) and related changes in patterns of human behaviour (personal preferences and expectations, mobility patterns, social networks, etc.) and international developments (UN Sustainable Development Framework4, global ICT governance agreements, etc.) affecting the state's role in society and expectations for public policies and services.

5. **Innovative SME-s and the digital economy** – R&D focused on sustainable and innovative utilization of human resources, capital and technology in small and medium-sized enterprises in order to enhance value creation and improve the international competitiveness of the economy.

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;
  - $\circ$   $\;$  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.

Estonian 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): 3

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: no
- 2.2. At your unit/department: no

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: no
- 3.2. At your unit/department: no

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 turnover rate is low.

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

2. Does HEI use MOODLE for educational purposes?

University uses MOODLE for education purposes.

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

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:

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.
- internationalization and mobility,
- student motivation to transition to e-learning.



#### **5 REFERENCES**

Dawn Naylor & Julie Nyanjom (2020) Educators' emotions involved in the transition to online teaching in higher education, Higher Education Research & Development, DOI: 10.1080/07294360.2020.1811645

Liisa Postareff & Sari Lindblom-Ylänne (2011) Emotions and confidence within teaching in higher education, Studies in Higher Education, 36:7, 799-813, DOI: 10.1080/03075079.2010.483279

Dietz L, Horve PF, Coil DA, Fretz M, Eisen JA, Van Den Wymelenberg K. 2020. 2019 novel coronavirus (COVID-19) pandemic: built environment considerations to reduce transmission. mSystems 5:e00245-20. <u>https://doi.org/10.1128/mSystems.00245-20</u>.

Bavel, J.J.V., Baicker, K., Boggio, P.S. et al. Using social and behavioural science to support COVID-19 pandemic response. Nat Hum Behav 4, 460–471 (2020). <u>https://doi.org/10.1038/s41562-020-</u> 0884-z

Megahed, N. A., & Ghoneim, E. M. (2020). Antivirus-built environment: Lessons learned from Covid-19 pandemic. Sustainable cities and society, 61, 102350. https://doi.org/10.1016/j.scs.2020.102350

Ko, W., Schiavon, S., Zhang, H., Graham, L. T, Brager, G., Mauss, I., & Lin, Y. (2020). The impact of a view from a window on thermal comfort, emotion, and cognitive performance. UC Berkeley: Center for the Built Environment. <u>http://dx.doi.org/10.1016/j.buildenv.2020.106779</u> Retrieved from <u>https://escholarship.org/uc/item/09b861jb</u>

Aristovnik, Aleksander; Keržič, Damijana; Ravšelj, Dejan; Tomaževič, Nina; Umek, Lan. 2020. "Impacts of the COVID-19 Pandemic on Life of Higher Education Students: A Global Perspective" Sustainability 12, no. 20: 8438. <u>https://doi.org/10.3390/su12208438</u>

Yen, SC., Lo, Y., Lee, A. et al. Learning online, offline, and in-between: comparing student academic outcomes and course satisfaction in face-to-face, online, and blended teaching modalities. Educ Inf Technol 23, 2141–2153 (2018). <u>https://doi.org/10.1007/s10639-018-9707-5</u>

Ramona Maile Cutri, Juanjo Mena & Erin Feinauer Whiting (2020) Faculty readiness for online crisis teaching: transitioning to online teaching during the COVID-19 pandemic, European Journal of Teacher Education, 43:4, 523-541, DOI: 10.1080/02619768.2020.1815702

Ackermann, C. (2021), "A personal narrative on understanding and navigating transitional change: lessons learned by an accounting academic amidst COVID-19", Accounting Research Journal, Vol. ahead-of-print No. ahead-of-print. <u>https://doi.org/10.1108/ARJ-08-2020-0281</u>

Olasile Babatunde Adedoyin & Emrah Soykan (2020): Covid-19 pandemic and online learning: the challenges and opportunities, Interactive Learning Environments, DOI: 10.1080/10494820.2020.1813180

Miki Yoshimura (2008) Educators in American online universities: understanding the corporate influence on higher education, Journal of Education for Teaching, 34:4, 295-305, DOI: 10.1080/02607470802401412



Evrim Baran , Ana-Paula Correia & Ann Thompson (2011) Transforming online teaching practice: critical analysis of the literature on the roles and competencies of online teachers, Distance Education, 32:3, 421-439, DOI: 10.1080/01587919.2011.610293

Ben Williamson, Rebecca Eynon & John Potter (2020) Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency, Learning, Media and Technology, 45:2, 107-114, DOI: 10.1080/17439884.2020.1761641

Deirdre Ryan, Fiona Faulkner, Dominic Dillane & Robert V. Flood (2021): Communities of practice as a solution for the implementation gap in internationalisation of the curriculum, Higher Education Research & Development, DOI: 10.1080/07294360.2021.1877630

Johannes König, Daniela J. Jäger-Biela & Nina Glutsch (2020) Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany, European Journal of Teacher Education, 43:4, 608-622, DOI: 10.1080/02619768.2020.1809650

Wesley O'Brien, Manolis Adamakis, Niamh O'Brien, Marcos Onofre, João Martins, Aspasia Dania, Kyriaki Makopoulou, Frank Herold, Kwok Ng & João Costa (2020) Implications for European Physical Education Teacher Education during the COVID-19 pandemic: a crossinstitutional SWOT analysis, European Journal of Teacher Education, 43:4, 503-522, DOI: 10.1080/02619768.2020.1823963

Betty Leask (2020) Embracing the possibilities of disruption, Higher Education Research & Development, 39:7, 1388-1391, DOI: 10.1080/07294360.2020.1824211

Sharmila Gamlath (2021): Peer learning and the undergraduate journey: a framework for student success, Higher Education Research & Development, DOI: 10.1080/07294360.2021.1877625

Wang, V. X., & Cranton, P. (2011). Transformative Learning. International Journal of Adult Vocational Education and Technology (IJAVET), 2(4), 58-66. doi:10.4018/javet.2011100105

Rodrigues, H., Almeida, F., Figueiredo, V. & Lopes, S.L. (2019). Tracking e-learning through published papers: A systematic review. Computers & Education, 136(1), 87-98. Elsevier Ltd. Retrieved February 15, 2021 from <u>https://www.learntechlib.org/p/208392/</u>.

Worldmeter (2021) <u>https://www.worldometers.info/coronavirus/country/estonia/</u> (as of the date of 15.02.2021)

International Commission on the Futures of Education, 2020. Education in a Post-COVID World: Nine Ideas for Public Action

https://unesdoc.unesco.org/ark:/48223/pf0000373717/PDF/373717eng.pdf.multi (accessed 15.02.2021)

European Students' Union (2020). Looking into the next academic year through the recommendations from students <u>https://www.esu-online.org/wp-</u> <u>content/uploads/2020/08/202008-Looking-into-the-next-academic-year-through-the-</u> <u>recommendations-from-students-.pdf</u> (accessed 15.02.2021)



NewMediaConsortium(NMC)HorizonReport(2018)https://library.educause.edu/resources/2018/8/2018-nmc-horizon-report