Assessment of Student Competences in Higher Education and Their Development Dynamics During the Study Period

SUMMARY OF STAGE 1
FINAL REPORT

2021

Introduction

The report presents a summary and analysis of the results obtained in the UL research "Assessment of Student Competences in Higher Education and Their Development Dynamics During the Study Period" as part of activity 3.2 implemented at the first stage of the ESF project 8.3.6.2 "Development and Implementation of the Education Quality Monitoring System" (8.3.6.2/17/I/001 (23-12.3e / 19/103)).

The final project stage 1 report was developed with the aim to inform the participants in the education system, policy planners and implementers, as well as the general public on the implementation, progress and results of the project stage 1.

The research is a long-term study at the national level initiated to implement the Activity programme "Growth and Employment" under measure 8.3.6.2 "Development of the Education Quality Monitoring System" of specific support objective 8.3.6 "To introduce the education quality monitoring system".

The aim of the research "Assessment of Student Competences in Higher Education and Their Development Dynamics During the Study Period" was to examine the development dynamics of students' professional, research, innovation, entrepreneurship, digital, global, and civic competence necessary for reaching the goals of Latvian Smart Specialisation Strategy (hereinafter - RIS3) as well as factors affecting this development; to evaluate the quality of education offered by Latvian higher education institutions to ensure inclusive growth and development of the active, civic and European knowledge society necessary for developing locally rooted and globally connected human capital and education quality monitoring system (Cross-Sectoral Coordination Centre, 2020; Ministry of Education and Science, 2020).

The first stage of the research comprised an analysis of scientific literature and good practices related to the impact of higher education on the development of human capital, study of the main factors contributing to the development of students' competencies, formulation of the

"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

theoretical framework of *learning outcomes*, defining professional, research, innovation, entrepreneurship, digital and global, as well as civic competences and methodology of their assessment, including generation of competence maps and qualitative and quantitative indicators for assessing their development dynamics within Latvian RIS3, as well as creative industries, public administration and education areas. Linking study programmes with RIS3 areas should be based on the related science branches defined for each field within the framework of RIS3 monitoring, and performed according to the description of the RIS3 specialisation area ecosystems developed in 2015.

The developed methodology will ensure long-term measurement of certain aspects of the quality of higher education necessary to identify changes in student performance, initiate new policy measures and, at the institutional level, provide methodological support to lecturers in formulating learning outcomes. At the same time, the obtained data will be integrated to monitor changes in the quality of education and evaluate the performance of higher education institutions, including the efficiency of investments in modernisation of higher education and measures for higher education quality improvement, human capital development and achievement of Latvian RIS3 goals (Ministry of Education and Science, 2020; monitoring system concept, 2017).

The project stage 1 results in policy recommendations for assessing transversal competences of students in higher education.

1. The nature of transversal competences

Transversal competences are essential at almost all levels of education, and especially in higher education, as they are necessary for successful adaptation to change and for living a productive and meaningful life (Trzmiel, 2015; Larraz, Vázquez, Liesa, 2017). In its turn, the development dynamics of students' competences in higher education is relevant to assess the extent to which higher education institutions provide training of specialists in accordance with the requirements of the labour market, that is how students can prove their knowledge and skills with their performance.

Transversal competences are actualised both in theoretical literature and in the labour market demands, and it also determines their important place in the learning outcomes of higher education programmes. In view of the above, transversal competences were identified and defined, and their fundamental components were named.

2. Transversal competences as learning outcomes

Digital competence relates to human behaviour when using information and communication technologies and digital media to effectively communicate and manage information, collaborate, create and disseminate knowledge in professional (and/or learning) activities. This competence consists of:

1) *information literacy and data literacy*, which include browsing and searching for information and digital content, data filtering; evaluation of data, information and digital content; data, information and digital content management;

2) *communication and cooperation* established by the interaction with digital technologies; sharing using digital technology; involvement in civic activities using digital technologies; cooperation using digital technologies; netiquette; digital identity management;

3) *digital content creation* classified through digital content development; integration and re-development of digital content; copyright and licensing; programming;

4) *security* covered by device protection; protection of personal data and privacy; protection of health and well-being; environmental protection;

5) *problem solving*, that is, solving technical problems; needs assessment and technological solutions; identifying digital skills gaps.

Innovation competence is characterised by knowledge and skills required for long-term implementation of useful, effective improvements or innovations (new products or solutions, inventions (process outcomes), methods, devices, ideas) that are useful to people or organisations. This competence consists of:

1) *creativity,* characterised by the student's ability to recognise manifestations of creativity in various fields and situations that promote innovation, as well as to use a creative approach in performing various tasks;

2) *critical thinking,* characterised by the student's ability to judge critically, skilfully taking responsibility for the structures inherent in thinking, which manifests itself as the ability to think alternatively, to recognize and analyse long-term solutions, generalise tasks into categories and evaluate the relevance of ideas;

3) *initiative,* characterised by the student's ability to use those components of the initiative that promote the involvement of individual and society in expanding and implementing innovative ideas;

4) *teamwork,* characterised by the student's ability to successfully cooperate in a team looking for ways to improve and perfect teamwork;

5) *networking,* characterised by the student's ability to make contacts, gain experience and knowledge inside and outside the organisation in order to improve the quality of teamwork.

IEGULDĪJUMS TAVĀ NĀKOTNĒ
"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

Entrepreneurial competence is characterised by the ability to create, see or transform ideas and opportunities into action by mobilising and effectively using necessary resources to achieve goals. This competence is determined by:

1) *problem-solving skills and creativity to create value - for oneself and/or society*, characterised by the student's ability to notice opportunities and critically evaluate them, create solutions that add value to society/market and adopt strategic, ethical, long-term decisions;

2) *identification, mobilisation, and effective use of internal and external resources,* characterised by the student's ability to use their strengths and opportunities to overcome failure and challenges, mobilise financial and human resources to achieve goals/create value;

3) *initiative and action orientation,* characterised by the student's ability to show initiative, set goals and plan their achievement, assess risks, work and lead a team, evaluate results and make improvements to achieve the highest possible result.

Civic competence is characterised by human participation in civil and social life which contributes to social and political well-being and sustainability at the level of community, nation, Europe and globally. This competence includes:

1) *understanding and implementation of civil rights and obligations*, characterised by the relatedness of rights and obligations; social justice management;

2) *knowledge and application of the principles of a democratic society*, which includes management of binding regulations, local and international cooperation, governance of the political system;

3) *community involvement*, characterised by involvement at the local and national levels, involvement at the level of the global community, management of social and political protests;

4) *civic capacity*, which is reflected in civic involvement and capacity in the local community, civic engagement, and capacity in a global context**.**

Global competence is characterised by the student's ability to assess local, global and intercultural issues, understand and appreciate different perspectives and worldviews, engage in open and effective interaction with people from different cultures, and work for collective well-being promoting sustainable development. This competence consists of:

1) *information management*, which is reflected in the search for information, evaluation and management of information content;

2) *awareness of diversity in local and global communities*, that is, awareness and understanding of different worldviews, recognising the signs of radicalisation (hatred, violence, threats to human rights and calls for division of society); cooperation at the local and international level; management of diversity policies;

3) *intercultural communication and cooperation* defined by communication in a multicultural environment, action modelling in an intercultural context, involvement in international activities;

4) *values and attitudes in an intercultural environment* characterised by moral and ethical principles and actions, communication skills in intercultural and interreligious situations, actions to promote an inclusive environment.

Research competence is characterised by human behaviour in conducting research activities in one's professional (and/or learning) environment, the activities which result in solving an independent research problem. This competence consists of:

1) *attitude and ethics* comprising research interest, responsible research, research ethics;

2) *conceptualisation of knowledge/research planning*, i.e. understanding of the research context, critical analysis of information sources and research conceptualisation/design;

IEGULDĪJUMS TAVĀ NĀKOTNĒ
"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

3) *conducting research*, which is reflected in the implementation of research methodology, data analysis, interpretation of data and formulation of conclusions, organisation of the research process;

4) *collaboration and communication* comprising collaboration in the research process, communication and publicity, practical application of research results.

3. Topicality of transversal competences in the industry sectors analysed in the project

In view of the identified transversal competences and their components, the study examined Latvian RIS3 areas of specialisation.

Information and communication technologies are relatively new both scientifically and technologically. Apart from the generally required technical knowledge, for ICT professionals it becomes increasingly important to improve their social skills, for they must be able to adapt to quickly changing demands generated by modern society and advancement of science. There were identified a number of transversal competences indispensable in the field of ICT, and they are digital, innovative, entrepreneurship, research, communication, critical thinking, human relations, leadership, planning, and problem-solving competences. Such competences can enhance employment opportunities and influence the selection of a candidate in the labour market. Students who are able to present their knowledge in various digital and innovative ways are communicative and open to new ideas.

In biomedicine, medical technology, biopharmaceutical and biotechnology industries transversal skills are needed to make effective use of clinical/technical skills and knowledge in a broader healthcare context. From the perspective of the current transformation of healthcare

NACIONĀLAIS ATTĪSTĪBAS PLĀNS 2020

EIROPAS SAVIENĪBA
Eiropas Sociālais fonds

Izglītības un zinātnes ministrija

I E G U L D Ī J U M S   T A V Ā   N Ā K O T N Ē
"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

delivery, transversal competences are essential to facilitate the transition from the disease-oriented approach to clinical care delivery to value-based and personalised care models.

In addition to innovation and interdisciplinary teamwork, professionals in **the area of bioeconomy** have to be able to solve global problems and find sustainable solutions. Therefore, the creation and development of transversal competences through interdisciplinary learning is particularly important**.** The information on the importance of transversal competences in bioeconomy found in the existing research is multifaceted but fragmentary.

Transversal competences and their role in **the smart energy sector** have received little research attention; however, the need for cognitive, methodological, language, individual and interpersonal skills and their importance in the market are identified in various fields of engineering related to smart energy. Moreover, comparing the required skills defined in different study programmes, there are many coincidences. The analysis of good practises confirms that the development of transversal competences such as interpersonal, entrepreneurial, innovation, research, and global citizenship ones is essential for successful work in the smart energy sector.

In the sector of smart materials, technologies and engineering systems, the research on transversal competences focuses on engineering education, as engineering forms the core of the defined sector of smart specialisation. Due to the increasing automation of engineering tools, the digital competence of future engineers is becoming important. In the development process, the growing complexity of technical systems requires the involvement of diverse groups of engineers from around the world, which in turn emphasizes global competence. Civic competence is needed to create safe solutions, prevent damage to living beings and exclude risks of technogenic disasters. Research excellence is important for sustainability, energy efficiency and environmental friendliness of technical solutions. Innovation and entrepreneurial competencies are essential for generating ideas that can make technical systems increasingly safe, sustainable, non-harmful and

IEGULDĪJUMS TAVĀ NĀKOTNĒ
"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

efficient, and, further, for turning these ideas into technical solutions that contribute to a country's competitiveness and economic growth.

The sector of creative industries is very wide, with its sub-sectors not precisely defined. To determine competences comprehensively, the cultural policies of all the sub-sectors of creative industries should be reviewed for the range of currently existing ones. The literature reviewed in the course of the research condemns mechanical addition of transversal competencies without assessing the specifics of the field, and emphasises the need for further analysis of the significance of specific competences from the point of view of creative entrepreneurs, professionals-practitioners, university lecturers and students.

The focus on the competences needed in the future by students in higher education study programmes in the **area of public administration** demonstrates the necessity of developing digital competence. As the scope of work becomes more complex, the importance of creativity (skills to use existing knowledge and new information to create new knowledge), learning and self-development skills to improve one's performance continuously and independently, readiness to be flexible and adapt to change increases. In general, these competences form the basis for the personal efficiency of public administration employees and increase individual competitiveness.

The required professional competences **in the area of teacher education** are closely related to the competences that students need to acquire. However, the specification and indicators of transversal competences are not clearly defined in teacher education, and experts and researchers from different countries use different competence models and highlight different competence areas. The assessment of transversal competences is dominated by quantitative tools (mostly questionnaires), without detailed study of individual characteristics and skills of the teacher, as well as not capable of recording changes in the development of transversal skills. There are limitations to the use of questionnaires to assess transversal competences, and there is an increased risk of them becoming a mechanical, "quantifying quality" assessment tool.

4. Theoretical framework of learning outcomes in higher education

To define the theoretical framework of *learning outcomes*, project Stage1 involved the analysis of scientific and methodological literature, as well as education policy documents.

The performed analysis and its conclusions are addressed both to education policy makers enacting policy measures at the state and institutional level, and to the developers of higher education programmes and academic staff developing and updating study programmes and study courses.

At the level of study programmes and study courses, learning outcomes help to ensure coherence between the courses of one programme, programme succession (for example, Bachelor's - Master - doctoral), thus, ensuring the implementation of the student-centred learning. Learning outcomes present students with the opportunity to understand exactly what they will be able to do after a successful study period, which in turn promotes more active and responsible student learning/study and enhances students' self-assessment skills.

Policy-making documents increasingly emphasize the need for higher education to become more open and inclusive, including the recognition and acceptance of learning outcomes obtained elsewhere, which, of course, also requires the development of reliable assessment tools. Analysing the formation of higher education quality culture, study and teaching experiences, practices of study process development, researchers refer to policy documents and offer research-based recommendations for both policy makers and for developing the study process.

Researchers are encouraged to look at learning outcomes holistically and synergistically. Formally defined learning outcomes do not guarantee that assessment will be successful, so outcomes must be formulated in a meaningful, contextual, and collaborative way. Questionnaires as a tool for competence self-assessment promote students' understanding of study content, achievable results and professional activity, but they cannot be the only tool used in competence

NACIONĀLAIS ATTĪSTĪBAS PLĀNS 2020

EIROPAS SAVIENĪBA
Eiropas Sociālais fonds

Izglītības un zinātnes ministrija

I E G U L D Ī J U M S   T A V Ā   N Ā K O T N Ē
"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

assessment. Self-assessment and mutual assessment are essential components of assessment promoting the development of transversal competences in student-centred learning.

5. Professional autonomy - a criterion for the assessment of study results

The results to be achieved in the project envisage supplementing the set of indicators "**Learning Outcomes** (impact on human resources)" for higher education quality monitoring with qualitative and quantitative indicators. The Concept of the Higher Education Quality Monitoring System developed in Latvia in 2017 to assess the quality of higher education, formulates the definition of the quality of higher education and outlines the general model of monitoring.

As part of this study, the monitoring indicators defined in the Concept were analysed, as well as a systematic literature review was performed. The analysis supported by a discussion with Professor Robert Wagenaar (the University of Groningen) resulted in singling out **professional autonomy** as a qualitative indicator of higher education quality monitoring. Its further study as well as the development of an assessment tool are recommended for future research on higher education quality assessment.

Professional autonomy is a quality that confirms the ability to be independent, self-determined, self-directed in decision-making, flexible, and resilient in performing one's professional activities. On the basis of the systematic literature review, it can be concluded that in assessing students' professional autonomy 1) it is important to provide opportunities for lecturers to perform self-analysis and self-assessment of their professional activities; 2) there is a need in guidelines for the development of professional autonomy of lecturers and students; 3) it is necessary to integrate civic, social and cultural aspects into study programmes; 4) the assessment of professional autonomy should take into account four dimensions: a) social and cultural, b)

information and communication, c) governance and decision-making, and d) professional and research ethics, norms, values and professional standards; 5) in assessing professional autonomy three levels should be taken into account, and they are general, collegial and individual; 6) the assessment of professional autonomy may make use of study programme assessment tools; a higher degree of professional autonomy certifies that students are able to use knowledge and competences acquired at the higher education institution in their professional activities; 7) professional autonomy can be assessed using self-assessment questionnaires, with respondents having the opportunity to assess the components of their professional autonomy using the Likert scale.

6. Mapping of competences

To structure, visualise and analyse interrelations and connections of sub-competences, a competency mapping tool was developed, providing an opportunity to map competence indicators against transversal competencies listed in a selected classifier (for example, the National General Secondary Education Standard (Regulations No. 416 of the Cabinet of Ministers of the Republic of Latvia of 3 September 2019)) or knowledge, skill and competence descriptors of the Latvian Qualifications Framework (Regulations No. 322 of the Cabinet of Ministers of the Republic of Latvia of 13 June 2017). Mapping against such a classifier reveals both transversal competences in relation to the classifier and interrelationship of sub-competences, which are illustrated by linking different competence indicators to the same classifier entries.

In the project, mapping was implemented against the National General Secondary Education Standard and against the knowledge, skill and competence descriptors of the Latvian Qualifications Framework. The technical solution of mapping was explained, and the mapping process and analysis described. Based on the achievable transversal competences as specified in

the National General Secondary Education Standard and indicators of transversal competences of students in higher education developed within the framework of the project, the data structure obtained in the mapping was explained and visualisation was provided. The mapping results demonstrated discrepancy between the competences described in the study and their interrelationship. To determine whether the mapping results showed actual gaps in the learning outcomes of secondary students at the start of their studies in higher education institutions or only demonstrated gaps in the transversal competence descriptors of the National General Secondary Education Standard, the self-assessment of university students' research competences was analysed.

7. Transversal Competence Assessment Tool

There were several stages of the development of the Transversal Competence Assessment Tool (hereinafter TCAT). The *preparation phase* involved experts in 5 transversal competences and from 8 occupational fields. Based on the literature review, the definition of each competence was formulated, and the competence structure draft was developed, with sub-competences of each transversal competence and their possible dimensions defined. Then, for each dimension, 1 - 4 behavioural indicators were formulated, which would allow determining whether behaviour corresponding to a certain competence is characteristic of a particular individual. Furthermore, these behavioural indicators were disaggregated by levels of competence in the increasing order. Characteristic behaviour was assumed to be an indicator of the presence of competence, because for an individual to behave in one way or another, they must have knowledge, skills and attitudes in a particular field. During the *tool development phase,* a team of researchers working on the TCAT developed statements for a self-assessment questionnaire based on the previously determined behavioural indicators for each transversal competence. At the end of the tool development phase, the members of the expert group

NACIONĀLAIS ATTĪSTĪBAS PLĀNS 2020

EIROPAS SAVIENĪBA
Eiropas Sociālais fonds

Izglītības un zinātnes ministrija

I E G U L D Ī J U M S   T A V Ā   N Ā K O T N Ē
"Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā" ESF projekta Nr.
8.3.6.2. "Izglītības kvalitātes monitoringa sistēmas izveide un īstenošana" ietvaros
Projekta līguma numurs: 8.3.6.2/17/I/001 (23-12.3e/19/103)

(transversal competence researchers) provided feedback, comments, recommendations on the developed tool, and corrected some wording of behavioural indicators. In parallel, a section on demographic and study-related issues was developed, and it included questions about respondents' gender, age, place of residence, work and study experience. Then the *tool testing and refinement phase* was implemented. 19 students were asked to complete the questionnaire, after which each respondent had the opportunity to express their views on the ambiguities in the wording of the statements and suggestions for improving the wording. After summarising the results, the wording of 46 statements in the TCAT was clarified.

The survey data were collected in the period between 26 November 2020 and 13 March 2021. The questionnaire in the electronic form was created with the Internet survey tool *QuestionPro* for online completion. This tool offers comprehensive real-time data analysis as well as customised survey dashboards, allowing to follow respondents's answers online. 7 universities participated in the survey. During the survey period, the researchers regularly monitored the summary of data, i.e. how many respondents and from which fields of study completed the survey. Representatives of each university were communicated, and they repeatedly invited students to fill in the questionnaire.

62.68% of the respondents studied in academic study programmes, 37.32% - in professional study programmes, most of the participants, namely, 605, study full-time, 64 - part-time and 17 were enrolled in part-time distant studies.

The initial detailed analysis of the data comprised the *empirical distribution and factor analysis of the results, the exclusion of statements from the questionnaire and the calculation of indicator internal reliability*, as well as *average calculation and their factor analysis*. In general, it was found out that the transversal competence structure observed in the data was largely in line with the competence structure previously described by the experts.

The report describes the analysis of the results obtained in the pilot study for the possibility of tool approbation. The results demonstrate a trend, that is, higher levels of studies are characterised by higher average values of all transversal competences. The comparison of study levels indicates the validity of the transversal competence assessment tool, because in theory the study process should promote the development of transversal competences, and the obtained results are in accordance with this theoretical assumption. The analysis of the results makes it possible to assess for which competences the study progress is relatively more conducive, and it can serve as a background for further, more detailed and focused analysis, the analysis allowing to look at specific interests and needs of the user of the competence assessment tool.

The limitations of the transversal competence assessment tool were identified. The form of the questionnaire limits the validity of the assessment tool, and this limitation should be taken into account when using the tool and interpreting the obtained measurement data. It is not possible to generalise the obtained results to the general student population in Latvia or to student populations in specific fields of study. Recommendations for further use and improvement of the tool were provided.

8. Teacher professional competence assessment tool

The teacher professional competence assessment tool was developed, namely, there were provided the theoretical framework of teacher professional competence, the process of developing the teacher professional competence assessment tool, as well as sampling and data collection process were described, initial data analysis was performed, the second version of the initial and described teacher professional competence assessment tool was corrected.

Considering the data obtained in the approbation of the teacher professional competence assessment tool and their analysis, several changes were made, and a new version of the tool was

developed. The new version is available at https://docs.google.com/document/d/1CQ1hcg8PhYDJkFhFFw_F0f2PI1yBJf95oCEOY0W0C54/edit?usp=sharing. The developed tool can also be used as a tool for mutual evaluation and expert assessment. During stage 2 of the project, it is necessary to perform approbation and result analysis of the second version of the teacher professional competence assessment tool.

9. List of used literature and information sources

1. Akadēmiskās informācijas centrs (AIC) (2017). Augstākās izglītības kvalitātes monitoringa sistēmas koncepcija. Pētījuma ziņojums. Rīga: AIC.

2. Izglītības un zinātnes ministrija (2020).Uzsāk pētījumu par studējošo kompetencēm un to attīstības dinamiku. https://www.izm.gov.lv/lv/jaunums/uzsak-petijumu-par-studejoso-kompetencem-un-attistibas-dinamiku

3. Larraz, N., Vázquez, S., & Liesa, M. (2017). Transversal skills development through cooperative learning. Training teachers for the future. *On the Horizon,* 25(2), 85-95. doi:10.1108/OTH-02-2016-0004

4. Pārrersoru koordinācijas centrs (2020). Augstākajā izglītībā studējošo kompetenču novērtējums un to attīstības dinamika studiju periodā (1.kārta). Pētījumu un publikāciju datu bāze. http://petijumi.mk.gov.lv/node/3277

5. Trzmiel, B. (2015). Transversal Skills in TVET: Policy Implications. Paris: United Nations Educational, Scientific and Cultural Organisation.

6. Ministru kabineta 2019. gada 3. septembra noteikumi Nr. 416 "Noteikumi par valsts vispārējās vidējās izglītības standartu un vispārējās vidējās izglītības programmu

paraugiem". Publicēts oficiālajā izdevumā "Latvijas Vēstnesis", 27.09.2019., Nr. 197
https://www.vestnesis.lv/op/2019/197.6

7. Ministru kabineta 2017. gada 13. jūnija noteikumi Nr. 322 "Noteikumi par Latvijas izglītības klasifikāciju". Publicēts oficiālajā izdevumā "Latvijas Vēstnesis", 15.06.2017., Nr. 119
https://www.vestnesis.lv/op/2017/119.9

10. Publications
Publications in journals indexed to the Web of Science, Scopus and ERIH + databases

1. Slišāne, A., Lāma, G., Rubene, Z. (2021) *Self-Assessment of the Entrepreneurial Competence of Teacher Education Students in the Remote Study Process*// Sustainability Vol. 13, N 11 (2021), Article number: 6424, p.[1]-14 : tab., fig. https://doi.org/10.3390/su13116424. , URL: https://www.mdpi.com/2071-1050/13/11/6424 ISSN 2071-1050 (WoS and Scopus).

2. Oļesika, A., Lama, G., Rubene, Z. (2021) *Conceptualization of Digital Competence: Perspectives From Higher Education* // International Journal of Smart Education and Urban Society (IJSEUS) Vol. 12, N 2 (2021), p. 46-59. DOI: 10.4018/IJSEUS.2021040105, URL: https://www.igi-global.com/article/conceptualization-of-digital-competence/273240 ISSN 2574-8254 (ERICH+).

3. Slišāne, A., Rubene, Z. (2021) *Entrepreneurship Pedagogy: Entrepreneurial Skills and Mindset* // International Journal of Smart Education and Urban Society (IJSEUS) Vol. 12, N 2 (2021), p. 60-71. DOI: 10.4018/IJSEUS.2021040106, URL: https://www.igi-global.com/article/entrepreneurship-pedagogy/273241 ISSN 2574-8254. (ERICH+).

4. Slišāne, A., Lāma, G., Bernande, M. *Knowledge valorisation in doctoral studies in Latvia: Entrepreneurship and research competences development in the study process.*// Acta

Paedagogica Vilniensia. https://www.journals.vu.lt/acta-paedagogica-vilnensia (accepted for publication).

Publications Web of Science databases in indexed conference proceedings

5. Slišāne, A.(2021) *Conceptualization of pedagogical entrepreneurship.* Human, Technologies, and Quality of Education, University of Latvia. https://www.apgads.lu.lv/izdevumi/htqe-2021/53/

6. Medne, D., Rubene, Z., Iliško, Dz., Berande, M. (2021) *Conceptualisation of University Students' Civic Competence*. Human, Technologies, and Quality of Education, University of Latvia. https://www.apgads.lu.lv/izdevumi/htqe-2021/59/

7. Oļesika, A. (2021) *Social Innovations in Educational Sciences: Analysis of Current Research and Policy Documents*. Human, Technologies, and Quality of Education, University of Latvia. https://www.apgads.lu.lv/izdevumi/htqe-2021/23/

8. Ilisko, Dz., Rubene, Z., Olehnovica, E., Medne, D. Global Competence for Embracing Diversity by the Globally Minded Citizens in Higher Education // Proceedings of EDULEARN20 Conference, 6th-7th July, 2020 Valencia : IATED, 2020 N 4, p.8711-8717. ISBN 9788409179794.

Publications in other peer-reviewed scientific journals

9. Abuže, A., & Ļubkina, V. (2021). Transversal competencies for digital readiness and development of human capital in engineering education. *Environment. Technologies. Resources. Proceedings of the International Scientific and Practical Conference, 2*, 220-224. doi:https://doi.org/10.17770/etr2021vol2.6658

10. Abuže, A. (2020). Caurviju kompetences IKT studiju programmās: ieskats aktuālos pētījumos (Transversal Competencies in ICT Study Programs: An Introduction to Current

Research). *Education Reform: Education Content Research and Implementation Problems, 1*, 5-14. doi:http://dx.doi.org/10.17770/er2020.1.5197. *Iekļauts EBSCO: Education Research Complete index http://www.ebscohost.com/ un Directory of Research Journals Indexing.*

11. Pubule, Jelena & Blumberga, Andra & Rozakis, Stelios & Vecina, Anita & Kalnbaļķīte, Antra & Blumberga, Dagnija. (2020). Education for Advancing the Implementation of the Bioeconomy Goals: An Analysis of Master Study Programmes in Bioeconomy. Environmental and Climate Technologies. 24. 149-159. 10.2478/rtuect-2020-0062.

Master thesis

Oļesika A. (2020). Augstskolas studentu digitālās caurviju kom11petences konceptualizācija. Rīga. LU.

11. Contact information

Dr.paed. Prof. Zanda Rubene - Vice-Dean and Lead Researcher of the University of Latvia, Faculty of Education, Psychology, and Art, responsible for project management.
E-mail: zanda.rubene@lu.lv

Dr.psych. Prof. Ģirts Dimdiņš - Lead Researcher of the University of Latvia, Faculty of Education, Psychology, and Art, responsible for developing the research methodology.
E-mail: girts.dimdins@lu.lv