

# Expert group joint opinion

Evaluation Procedure: Assessment of Study Field

Higher Education Institution: University of Liepāja

Study field: Environmental Protection

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# Summary Assessment of the Study Field

## Summary Assessment of the Study Field

The study field "Environmental Protection" of Liepāja University is relevant in the context of both the EU and Latvian environment. The improved professional bachelor's study program "Environmental Innovation Technologies" and the professional master's study programme "Ecotechnology" ensure the continuity of studies within the university. The content of both programs is developed in accordance with the EU and Latvian environmental policy planning documents. Both study programs have a greater potential for the use of programs, if evaluated according to additional criteria, such as adult education, lifelong learning for certain modules in environmental programs, for the needs of companies related to the environmental sector (both public services and commercial sector). Both professional study programs need to be improved in technical terms in order to justify the term "professional education", with more emphasis on technical nuances. The Liepāja University has clearly defined the admission criteria for students, which can be found publicly on the website of the Liepāja University. In its activities, the Liepāja University has established the principles and mechanisms of academic integrity described in the University Code of Academic Integrity, which defines actions for detecting plagiarism and successive actions to eradicate them and their consequences, and is available to all parties concerned.

Along with the development strategy of Liepāja University 2016-2020, extended until 2023, a quality assurance system has been established to achieve the goals and study results of the study field and the respective study programs. The quality policy is briefly described on the website of the Liepāja University, however, the quality manual is not available to all parties involved. There are no clearly defined sectors / target audiences for graduates. The target number of students / graduates required per year is not measurable in order to more accurately predict the number of students. There is no identifiable division into the fields for which graduates are prepared - researchers and / or practitioners. Full-fledged information on the needs of postgraduate doctoral studies both in Latvia and abroad is not available. From the point of view of the sustainability of the programs, the minimum number of students should be precisely calculated in order to have an economically justified cost. Comparing the programs with the programs of other educational institutions both in Latvia and abroad, the added value for students and potential students should be highlighted in a broader perspective. If this is not possible, the target area must be clearly indicated. Long-term analysis of lecturers and their volume distribution. Both guest lecturers and elected lecturers pose a potential risk of non-fulfillment of programs if someone chooses to interrupt their teaching. No succession or substitution is visible. Improving the Moodle system, keeping presentation materials, lecture recordings (even if it takes place in person) would allow to reduce such risk. It may also be necessary to map trainers to understand how many professionals are available in the market and what the costs are.

Liepāja University has a system that mostly is reliant on state funding and doesn't have a strong system to determine financial resources required for successful implementation of the study field "Environmental Protection" and the study programmes "Ecotechnologies" and "Environmental and Renewable Energy Management and Engineering" outside the state funding and projects. There is no clearly defined system for financing of the research of academic staff aside from state granted projects and other grants. The infrastructure provided by LiepU is sufficient for the needs of the study field, but it does not have the necessary software for the study process, such as GIS software. LiepU provides basic resources for work, studies, and research: the study rooms are well-equipped, study books are available for study fields and generally for all the specific courses. LiepU has developed procedures to attract skilled teaching staff, but the recruitment process is less than formal. There is a serious lack of competitions for the academic positions and most of the academic personnel are not elected. Staff members go through self-evaluation taking into consideration feedback of the students, but it could benefit from further encouragement of the staff to keep up

with modern teaching methodology, pedagogical skill set and keep up with the latest developments in education, especially in areas such as student-centred learning and problem-based learning. LiepU has an admirable student support system that focuses on student needs ensuring the necessary assistance. The students and graduates also acknowledged the accessibility and openness of the administration.

Liepaja University has good research culture in environmental studies - the professional bachelor's programme 'Environmental innovation technologies' and the professional master's programme 'Ecotechnologies'.

Experts found that in spite of that the both programmes are professional, the research activities are performed on good level, i.e. the academic staff and students take part in research projects, present their findings in national and international conferences and publish the results in national and international journals.

Analysis of the themes of the course works and final thesis defended in the previous years shows, that majority of them strongly correlate with the programmes goals and strategies. Also in many of them the actual business, regional and public problems were analysed and the solutions provided, which were implemented in the real objects.

The both programmes seems to be well organized and target oriented. But LiepU should elaborate on the development of an efficient continuous mechanism how to more actively involve teaching staff into higher level research activities, which will end up with higher level publications and better prestige of LiepU. Also special attention should be paid to new software and hardware, which will rise competences of the teaching staff and the students, and will provide the advances in the competition with other universities in the study field.

LiepU has managed to position itself centrally in the city of Liepaja in the general field of Environmental protection. They have created a network of collaborators (local companies and municipal/governmental organizations, as well as NGOs) through which they have managed to implement a successful internship program within their undergraduate and graduate Programs of Study. However, what seems to be currently lacking may be a more international outlook for the fields of study under evaluation. The exchange of knowledge and experiences among students and faculty members from different countries, although recognized by the University as important, still needs to be further reinforced and more systematically explored.

## **1. Management of the Study Field**

### **Analysis**

1.1. In accordance with the strategy of the Liepaja University (hereinafter - LiepU), the field of study "Environmental Protection" is relevant in the context of both the EU and Latvian environment. The improved professional bachelor's study program "Environmental Innovation Technologies" and the professional master's study program "Ecotechnology" ensure the continuity of studies within the university. The content of both programs is developed in accordance with the EU and Latvian environmental policy planning documents. The management of Liepāja University has a desire to support the direction of "Environmental Protection" as a priority. It should be noted that certain Latvian environmental planning documents are being developed in a new wording, therefore it is recommended to review the latest priorities in national and EU-wide planning documents, such as the Latvian Environmental Policy Guidelines for 2021-2027. The topicality of both programs is currently limited to the regional framework, which is important for the basic principles of regional development. There is a common opinion among both students and graduates that study programs in general provide a range of environmental knowledge and knowledge that complements their understanding, along with technical knowledge, which allows for a greener approach to technical solutions and changes the way of thinking in general.

1.2. The programmes of the field of study 'Environmental Protection' are implemented by the LiepU Faculty of Science and Engineering. The work of the faculty is organized by the dean, methodologist, secretary and rapporteur in cooperation with the directors of the study programs and the heads of the study fields. The management structure (according to Annex II.1.4.A.) of the study field ensures the development of the study field, administrative and technical support is provided. In accordance with the LiepU Regulations on Heads of Study Fields and Directors of Study Programs, the head of the study field is responsible for the development of study programs, their succession, compliance with all regulatory documents and topicality of study programs, thus assuming the main responsibility for study programs. The responsibilities of program directors are mainly based on the content compliance of study programs and their implementation. Assessing the availability of study program support, according to the information obtained during the visit and interviews, the support is largely based on the initiative of teachers - enthusiasts in their field, as well as the interest of invited guest lecturers. During the visit, insights into practical considerations and research have been gained. Objectively speaking, professional study programs must be improved in technical performance in order to justify the term "professional education". It is recommended for the head of the study field to go into the implementation of study programs more precisely and objectively and to assess the risks of support availability.

The management structure of the LiepU focuses on development of study programs, it provide administrative and technical support. The support is largely based on the initiative of teachers - enthusiasts in their field, as well as the interest of invited guest lecturers. During the visit, insights into practical considerations and research have been gained. Objectively speaking, professional study programs must be improved in technical performance in order to justify the term "professional education".

1.3. LiepU has clearly defined the admission criteria for students, which can be found publicly on the LiepU website. The duration of studies is clearly defined - full-time studies 4 years. The admission requirements for the professional bachelor's study program "Environmental Innovation Technologies" are precisely defined that persons who have acquired secondary education since 2004 must have the results of centralized examinations in Latvian, mathematics and a foreign language. Persons who have acquired education before 2004 must have an annual assessment in a certificate / diploma or an assessment of centralized examinations in Latvian, mathematics and a foreign language. Advantages are given to persons who have won the first to third place in the Latvian State Physics, Biology or Chemistry Olympiads in 2019, 2020 or 2021, as well as the first to third place winners in the chemistry, biology or engineering sections of the Latvian State / Region Student Scientific Conference In 2010, 2020 or 2021. It should be noted that although this program is planned to be implemented only in Latvian, the names of study programs on the LiepU website differ in Latvian and English versions. The correct name is only in the Latvian version. Recommendation to correct this discrepancy.

Admission criteria for the professional master's study program "Ecotechnology" are available in Latvian and English, as the master's program can also be implemented in English. The duration of studies is fixed - full-time studies 1 year and 6 months. Latvian admission requirements stipulate that persons need 2nd level professional higher education (5th level professional qualification in social sciences, environmental, natural or engineering sciences) or other 2nd level professional higher education and at least 2 years of work experience in environmental management or environmental engineering. in the field. Entrance examinations are also planned as a written examination on a freely chosen and topical research problem, as well as discussions on the topicality of the research problem and personal experience in the field. Concerning the admissions requirement for the study programme of "Ecotechnologies", both prescribed entrance tests are compulsory and are implemented as a common examination. It is planned to study in English only for a fee. There are no well-defined entrance examinations for studies in English. The program in English does not provide opportunities for succession to doctoral studies, which reduces the

competitiveness of this program. It is recommended to clarify these issues in order to create an equal approach. Analyzing the capacity and admission criteria of both study programs, a greater potential for the use of the programs can be seen, it may be necessary to change the admission criteria in the master's program in order not to limit the number of possible students. It is necessary to emphasize the possible contribution of both programs through adult education, lifelong learning for separate modules directly in environmental programs. The strategy of LiepU emphasizes that it has value. Through the modules of separate modular programs, there is a possibility to attract a company related to the environmental sector (both in the field of public services and in the commercial sector). Given the overall decline in the number of students in recent years, this would make it possible to better plan the flow of students and also plan the budget revenues that could be generated for modular training.

The LiepU has established a system and developed arrangements for student admissions, recognition of the achievements of previous study periods. The assessment of student achievements and learning outcomes requires the development of uniform criteria for all subjects of study, since it was found during the expert visit that academic staff was not always able to define the principles for posting evaluations.

1.4. In its activities, LiepU has defined the principles and mechanisms of academic integrity described in the University's Code of Academic Integrity. The Code of Academic Integrity sets out the following basic principles that apply to both staff and students:

- honesty and fairness
- responsibility
- loyalty
- respect

The Code of Academic Integrity defines actions for detecting plagiarism and successive actions to eradicate them and eliminate their consequences. LiepU Code of Academic Integrity is available to all parties to whom it applies.

1.5. The website of LiepU contains information about both study programs, they correspond to the information available in the official registers. The information contains all the essentials for those who want to study at the moment. Information about the professional master's study program "Ecotechnology" is also published in English, taking into account that the program is also intended to be taught to English-speaking applicants.

## **Conclusions. Strengths and weaknesses**

The study direction "Environmental Protection" of LiepU is relevant in the context of both the EU and Latvian environment. The improved professional bachelor's study program "Environmental Innovation Technologies" and the professional master's study program "Ecotechnology" ensure the continuity of studies within the university, but only in Latvian. The master's program in English does not provide opportunities for succession to doctoral studies, which reduces the competitiveness of this program. The content of both programs is developed in accordance with the EU and Latvian environmental policy planning documents. Both study programs have a greater potential for the use of programs, if evaluated according to additional criteria, such as adult education, lifelong learning for certain modules in environmental programs, for the needs of companies related to the environmental sector (both public services and commercial sector). Both professional study programs need to be improved in technical terms in order to justify the term "professional education", with more emphasis on technical nuances. LiepU has clearly defined the admission criteria for students, which can be found publicly on the website of the LiepU. In its activities, LiepU has established the principles and mechanisms of academic integrity described in the University Code of Academic Integrity, which defines actions for detecting plagiarism and successive actions to

eradicate them and their consequences, and is available to all parties concerned.

The management system is focused on the development of each specific study programme, but there is a lack of a common vision for development towards environmental protection study field in general.

Strengths:

1. The common field of study is relevant in the context of both the EU and Latvian environment.
2. There is a common opinion among both students and graduates that the professional master's study program "Ecotechnology" provide a range of environmental knowledge and knowledge that complements their understanding alongside technical knowledge, which allows for a greener approach to technical solutions and changes the thinking approach in general. This strength is related to the program conducted in Latvian.
3. A clear Code of Academic Integrity has been developed.
4. The management system allows foreign professors to be contracted and provide sufficient resources.

Weaknesses

1. The potential of those wishing to study both study programs is not fully understood, if evaluated according to additional criteria, such as adult education, lifelong learning for separate modules in environmental programs, for the needs of companies related to the environmental sector (both public services and commercial sector).
2. Both professional study programs must be improved in technical performance in order to justify the term "professional education", as the content of both programs doesn't contain much technical studies.
3. According to the results obtained in the interviews, it is concluded that when developing the study direction and study programs, they are more oriented to the needs of the conditional market of the region, which narrows their relevance on a larger scale.
4. The management system does not work sufficiently effectively in ensuring the uniform identity of the study programmes established in the course of studies.

## **2. Efficiency of the Internal Quality Assurance System**

### **Analysis**

2.1. Along with the development strategy of LiepU 2016-2020, extended until 2023, a quality assurance system has been established to achieve the goals and study results of the study field and the respective study programs (see Annex II.2.2.A.). Main objective is to provide research-based, regionally necessary, Latvian and internationally competitive and high-quality opportunities for higher professional, academic and lifelong learning, promoting economic development based on knowledge and professional competencies and strengthening of creative, culture-oriented society. Taking into account the tasks defined in the overarching goal and the quality management structure, it has been established in accordance with the principles of good practice and is based on generally accepted quality measurements. However, as a result of the answers received during the visit and interviews, there is no assurance that the established quality system is fully used as written and there is a lack of clear measurements, for example, about cooperation partners, stakeholders (students, graduates, employers, professional organizations, scientific institutions,, municipalities) and their opinions. This also applies to access to lifelong learning.

The quality assurance system should include basic items such as clearly defined sectors / target audiences for which graduates are expected to be trained. There must be a clear awareness of the

required target number of students / graduates per year in order to be able to forecast the number of students more accurately. The quality assurance system must primarily identify market and demand potential, in line with the overarching goal. Otherwise, a situation may arise where there is no demand for graduates. During interviews with graduates, it is clear that obtaining a degree in one, the other or both programs makes it difficult to find a place in the labor market if you do not come from a “ready-made” field. This will promote a more precise improvement of the study field and the respective study programs. It is also recommended to determine the division into the fields for which graduates are prepared - researchers and / or practitioners. It is recommended to make a mapping according to the needs of master's doctoral studies both in Latvia and abroad for the needs of students (if applicable). This will give students the choice to go into practice or research. From the perspective of program sustainability, accurately calculate the minimum number of students to have economically justified costs. If the number of students is lower than the set minimum, consider the possibility of combining subjects with students of another program to whom they can be applied. Interviews and changes in the total number of students / graduates show that it is difficult to maintain the number of students.

2.2. Although the quality assurance system defines the study program of the field of study and the feedback mechanism, including feedback for students, employers and graduates, no substantiated evidence was found during the interviews with students, graduates and employers that these mechanisms work effectively, especially for employers whose needs have not been fully identified. During the interviews, it was confirmed that the demand of graduates of both study programs in the labor market is not high, unless the studies are considered as the acquisition of additional competencies to strengthen the skills of an already acquired profession. Once again, it is important to first identify the target audiences / sectors for which graduates are being prepared. During the site visit and interviews experts got very wide interpretation on this issue which is leading to nowhere. University shall clearly define target audiences in name - e.g. water companies, industrial companies, design or construction companies e.t.c. So, the students can have clear picture of the possibilities to get to work. So far during the interviews experts haven't got a good picture of getting the job in environment-related companies. More experts see that there is almost no chance to be in the labor market.

2.3. According to the information provided by LiepU, every year on October 1, statistical data on the number of students, matriculated number, number of graduates, number of academic staff are collected - they are included and analyzed in the self-assessment report of the study field. LiepU has developed procedures that determine the manner in which annual student satisfaction surveys and graduate surveys are conducted. The self-assessment reports of the study fields analyze the compliance of the study field and study programs with the demand of the labor market, the annual results of the employer survey. These data are available only for LiepU internal use.

According to the information obtained during the visit and interviews, although LiepU collects and analyzes statistical data on both study programs of the study field, it is not efficient enough to be able to perform qualitative and sufficiently quantitative measurements. Comparing the programs with the programs of other educational institutions both in Latvia and abroad, the added value for students and potential students should be highlighted in a broader perspective. If this is not possible, the target area must be clearly indicated.

2.4. LiepU has set the standards set out in Part 1 of the ESG. In order to improve the performance of study programs in the field of study, the Liepaja University has set goals and measures that have been implemented in the common quality assurance system. However, an important aspect of long-term analysis of teachers and their distribution is also worth mentioning here. Both guest lecturers and elected lecturers pose a potential risk of non-fulfillment of programs if someone chooses to

interrupt their teaching. No succession or substitution is visible. Improving the Moodle system, keeping presentation materials, lecture recordings (even if it takes place in person) would allow to reduce such risk. It may also be necessary to map trainers to understand how many professionals are available in the market and what the costs are.

### **Conclusions. Strengths and weaknesses**

The quality policy is briefly described on the website of the LiepU, however, the quality manual is not available to all parties involved.

The tasks defined in the overarching goal and the quality management structure have been established in accordance with the principles of good practice and are based on generally accepted quality measurements.

There is no assurance that the established quality system is fully used as written and there is a lack of clear measurements.

There are no clearly defined sectors / target audiences for graduates. The target number of students / graduates required per year is not measurable in order to more accurately predict the number of students. There is no identifiable division into the fields for which graduates are prepared - researchers and / or practitioners. Full-fledged information on the needs of postgraduate doctoral studies both in Latvia and abroad is not available. From the point of view of the sustainability of the programs, the minimum number of students should be precisely calculated in order to have an economically justified cost. Comparing the programs with the programs of other educational institutions both in Latvia and abroad, the added value for students and potential students should be highlighted in a broader perspective. If this is not possible, the target area must be clearly indicated. Long-term analysis of lecturers and their volume distribution. Both guest lecturers and elected lecturers pose a potential risk of non-fulfillment of programs if someone chooses to interrupt their teaching. No succession or substitution is visible. Improving the Moodle system, keeping presentation materials, lecture recordings (even if it takes place in person) would allow to reduce such risk. It may also be necessary to map trainers to understand how many professionals are available in the market and what the costs are.

Strengths:

1. The tasks defined in the overarching goal and the quality management structure, have been established in accordance with the principles of good practice and is based on generally accepted quality measurements.

Weaknesses

1. The quality assurance system is not be publicly available to all parties involved
2. Statistical data on both study programs of the study field are available for internal use in LiepU and, according to the results of the interviews, are not efficient enough to be able to perform qualitative and sufficiently quantitative measurements.
3. The minimum number of students has not been calculated in order to have economically justified costs for the maintenance of the programs.

### **3. Resources and Provision of the Study Field**

#### **Analysis**

3.1 Liepaja University manages its finances by developing a budget plan every year. It is developed by the Director of Finance and Staff with the prior coordination of the senate Budget Commission and is approved by the university's senate. The main income of the university is from the state budget grant and its own revenues from tuition fees.

The cost of tuition fee in both study programmes "Ecotechnologies" and "Environmental and Renewable Energy Management and Engineering" is noticeably higher than the average fee of similar programmes in Latvia. Even though the cost of both is not significantly different. And there is a noticeable difference between international students' study fee and Latvian students' study fee. But most students study using the study place covered by the state budget grant.

Scientific research is also mainly financed by state grants and projects. Liepaja University does not directly invest heavily into scientific activities of the staff. But they do partly support student research and participation in scientific conferences. Aside from that, considering that one of the priority development directions of Liepaja University are scientific work and innovation, it would be very beneficial for Liepaja University to improve the financial support of scientific activity, creating a clear, permanent plan to develop financing research and innovation.

The tuition fee for "Ecotechnologies" and "Environmental and Renewable Energy Management and Engineering" is higher than average in Latvia and could be an issue for further growth of the programmes as it is less affordable for students. Liepaja University has developed a clear system to determine the financial resources required for the implementation of the study field and the corresponding research activities, but it's too reliant on state grants and has no clear, permanent methodology of resource allocation for future research and study outside the state grants.

3.2 The infrastructure provided by Liepaja University is sufficient for the needs of the study field and the programmes "Ecotechnologies" and "Environmental innovation technologies". The teaching base is sufficient - the required materials are available in the library, and they are regularly updated, and purchases of the requested books are regularly made. Access to databases is sufficient and they are regularly used by the students. There is also a very active use of open-source materials by students and is also encouraged by the academic staff. The procedure of ordering provisions is mostly the duty of the librarians, they regularly take note of the need of the study programmes and make the necessary additions if the budget is sufficient to implement these requirements.

Access to reading rooms, library and school computers is very easy and student friendly. But it does not have the necessary software for the study process, such as GIS software, that is used by the graduates of environmental studies. There are open-source options, but they are mostly outdated. Notable is that the software that is available - most of it is also available from home with student VPN accounts and the access granted outside working hours Liepaja University. Liepaja University provides basic resources for work, studies and research: the study rooms are well-equipped, study books are available for study field and generally for all the specific courses from. The library is always available during the working hours of Liepaja University with space available for work and studies.

3.3 As noted in the self-assessment report the selection of the teaching staff in the implementation of the study programmes is carried out based on the Criteria for the Assessment of the Compliance of the Professional Qualification of the Academic Staff with the Taught Courses. But as noted in onsite interviews with the academic staff, the selection process is very personal, and the study courses are adjusted to comply with the potential candidates that have been previously scouted. Liepaja University has developed procedures to attract skilled teaching staff, but the recruitment process is less than formal.

Often, successful professionals in certain fields are invited to work as guest lecturers. In fact, such non-permanent staff makes up the majority of the faculty, although it must be added that the main share of scientific workload is still managed by the permanent faculty members.

There is a serious lack of competitions for the academic positions and most of the academic personnel are not elected. Since there are no doctorate studies in the Environmental protection study field, Liepaja University can't assure the regrowth of academic staff from within the university. The Expert group sees room for improvement in the recruitment process and would urge the administration to seek ways to attract professionals that are willing and interested to work in the elected academic positions and work more compliant with the courses of the study field.

Though it must be noted that the staff of Liepaja University is competent and have valuable professional expertise in their respective fields. Staff members go through annual self-evaluation taking into consideration feedback of the students. Even though this ensures a valuable quality evaluation and improvement of the staff, it could benefit from further encouragement of the staff to upkeep with modern teaching methodology, pedagogical skill set and keep up with the latest developments in education, especially in areas such as student-centred learning and problem-based learning.

The permanent teaching staff's workload is balanced but mostly the elected staff work on research and the rest is more focused on educational work. The workload often includes international cooperation and/or mobility opportunities. Though there is a lot of focus on research mobility and less on pedagogical mobility, the teaching staff is aware of these opportunities and actively partake in them.

3.4 Liepaja University has an admirable student support system that focuses on student needs ensuring the necessary assistance. Since Liepaja University is a relatively small university by the number of students, it can have a more hands on approach with the students to help them with adjusting to higher education, academic performance, study methods, and development of future endeavours in the field. The students and graduates also acknowledged the accessibility and openness of the administration, the approachability of superiors was well-regarded and highly valued.

Regular feedback is also ensured that is collected at the end of semester. The feedback information is collected on all the courses, taking in a count overall satisfaction of students. To ensure that there is no biases and students could feel free to express themselves, the information is proceeds by the student's self-government.

But there are issues with the consistency of information platforms used by the academic staff. There is a MOODLE system that is the main platform of information in Liepaja University, but not all academic staff use it and most of the staff uses information platforms that they like better or they are used to, making it difficult for students to organize and access the information needed for the study courses.

## **Conclusions. Strengths and weaknesses**

Liepaja University has a system that mostly is reliant on state funding and doesn't have a strong system to determine financial resources required for successful implementation of the study field "Environmental Protection" and the study programmes "Ecotechnologies" and "Environmental innovation technologies" outside the state funding and projects. There is no clearly defined system for financing of the research of academic staff aside from state granted projects and other grants. The infrastructure provided by Liepaja University is sufficient for the needs of the study field, but it does not have the necessary software for the study process, such as GIS software. Liepaja University provides basic resources for work, studies, and research: the study rooms are well-equipped, study books are available for study fields and generally for all the specific courses. Liepaja University has developed procedures to attract skilled teaching staff, but the recruitment process is less than formal. There is a serious lack of competitions for the academic positions and most of the academic personnel are not elected. Staff members go through self-evaluation taking into consideration

feedback of the students, but it could benefit from further encouragement of the staff to keep up with modern teaching methodology, pedagogical skill set and keep up with the latest developments in education, especially in areas such as student-centred learning and problem-based learning. Liepaja University has an admirable student support system that focuses on student needs ensuring the necessary assistance. The students and graduates also acknowledged the accessibility and openness of the administration.

Strengths:

- 1) Well-equipped library and broad choice and granted access to scientific and professional databases.
- 2) Great use of guest lecturers. Graduates and employers are asked to partake in lectures and teach.
- 3) There is a student-oriented support system, following the needs of students at any specific step of their studies and career development. The academic staff is very helpful and responsive.
- 4) The small student groups allow for regular assessment of students' progress and special support to students who have difficulties with studies.
- 5) There is a lot of mobility for students in the study field both in Latvia and abroad.

Weaknesses

- 1) The university cannot ensure the regrowth of academic personnel because it doesn't have a PhD program. Academic staff and Alumni are very inactive in obtaining of PhD degrees, that hinders number of the planned teaching staff at Liepaja University;
- 2) Most faculty members lack application of MOODLE in daily work. The information is scattered and poorly managed making it a difficult work organization.
- 3) The software programs are mainly open source, there is a lack of work with software that is currently being used in the work field and is applicable in the modern work environment.
- 4) Many courses are reliant on specific lecturers that if they left, the course would be shut down
- 5) There is a lack of elected academic personal to ensure long term development of the study programs
- 6) The laboratory resources are simple and very specific and do not allow for the development of a wide range of skilled specialists.
- 7) Science development is mostly reliant on government and project funds, there is little support from university funds.

#### **4. Scientific Research and Artistic Creation**

##### **Analysis**

4.1. The main directions of Liepaja University scientific research are defined in the Development Strategy for 2016-2020, which is based on the vision of the future and grounded in the assessment of the current situation and priorities listed in the international, national, regional and local planning documents. Three priority directions of development are highlighted in the document: studies and lifelong learning, scientific work and the development of innovations and management (management of human resources, projects, finances, infrastructure, information). In accordance to this document the study programmes development plans have been elaborated for reaching the performance indicators in 2020. Such planning background enables to correspond to national priorities (national research programmes), internationally relevant research directions, as well as regional development needs (orders of local governments, regional entrepreneurs, etc.). However it

is unclear how efficient was this strategy (the report on achievements of the planned results was not provided). Also the new strategy (the evaluation took place in June 2021) was not introduced. According to the documents provided by Liepaja University the above mentioned strategy is still in force, because the new strategy 2021 - 2027 is under preparation. Having in mind that strategies should be developed in advance in order to overcome possible problems and compete in the market (especially academic), it can be defined as a shortage (weakness), which can impact the efficiency of the study process and consequently demand of the study programmes related to Environmental Engineering and Environmental protection.

In Liepaja University the scientific research related to environmental protection is carried out in the Institute of Natural Sciences and Innovative Technologies (DITI) where interdisciplinary research groups with a focus on a comprehensive solution to topical scientific problems in cooperation with Latvian and foreign universities and entrepreneurs were established.

All research activities are supported by the Technology Transfer Centre, Prototyping Centre. Cooperation with the Business Incubator of Kurzeme and Science and Innovation Park founded by the Liepaja University is used for the introduction of research by students and young scientists into the national economy and commercialisation. The lecturers of many study courses in the direction are DITI leading researchers.

4.2. As it is stated in the Self-assessment report, science based teaching is very important to Liepaja University and research activities are considered as imperative for the study direction staff. Liepaja University scientific institutes and research groups in departments - scientific teams, which are creative, open to national and international cooperation and which form a national and international cooperation network for the implementation of current research topics and research projects. Also it should be highlighted that Liepaja University works for interdisciplinary research groups with a focus on a comprehensive solution to topical scientific problems in cooperation with Latvian and foreign universities and entrepreneurs, who are able to attract funds from entrepreneurs, national and international projects in order to achieve results. Research and business cooperation is supported by the Technology Transfer Centre and the Prototyping Centre. Cooperation with the Business Incubator of Kurzeme and Science and Innovation Park founded by the Liepaja University is used for the introduction of research by students and young scientists into the national economy and commercialisation. Another very important aspect is the publication of research results at the international level (in international conferences and congresses, in internationally cited publications), which is continuously growing. But looking from the perspective of the research tasks in the programmes, or teaching materials related to the students competence development, there is still big work to do - the explanations about newest research results integration into the teaching material and practical works are missing (the requirements to renew teaching materials, feedback from students, etc. are missing).

4.3. The material provided by LiepU shows, that big part of staff teaching in this study direction collaborate internationally and the main areas of their interest are:

Marine bio-waste research incl.(INTERREG Baltic Sea Region Programmes 2014-2020);

Development of ecological microcosm systems (incl. computer-controlled) for conducting eco-technological experiments and support of the study process (indoor aquaculture, mini-greenhouses, biofermentation equipment).

Eco-technological use of ecosystem services for the sustainability of local communities (National research programme ECOSOC-LV project 5.2.9 'Impact of changes in social consciousness on the sustainable provision of ecosystem services' (2015-2018).

Also Circular Economics Centre conducts Research in the areas of sustainability, circular economy, innovation, and education.

The teaching staff of the analyse area annually participates in the annual international scientific conference 'Innovations and Creativity' organised by the Department of Natural Sciences and Engineering. Also their students' research papers are regularly presented at Liepaja University Student Science and Creativity Days (student scientific conference), as well as at the annual international student scientific conference co-organised by Klaipeda University (Lithuania), Liepaja University (DITI Circular Economics Centre) and for the last two years, the University of Cádiz (Spain). Liepaja University develops the reports, where the information publication profile and topics in connection with participation in conferences and scientific seminars by academic personnel are presented. Unfortunately, the reports are only in Latvian language and from the perspective of the international coverage can be evaluated as the weakness.

Concerning the benefits for the study programmes:

- the research results are reflected in the content and methodology of the programmes courses, as well as in students' scientific research papers supervised by their teachers and bachelor's and master's theses. Also the students are involved in the research activities of DITI, for example, one bachelor student conducted research related to obtaining bioplastics from red algae, another - studied the possibilities of using probiotics in aquaculture. Also MSc students actively took part in the research: constructed a cascade-type aquaponic system, which was demonstrated at the international exhibition of inventors and innovations Minox 2020, developed a microscope for use in school educational activities, performed research work 'Eco-technological Approach for Non-formal Water Environmental Education'. Also in the MSc programme, students are required to present and publish the results of their research work at the international student scientific conference of Liepaja-Klaipeda-Cadiz universities. The exceptional results of students' research are included in the study programmes courses as the case studies.

The future plans presented in the Liepaja University strategy (the present actual) include the promotion of science and research, which will be carried out in cooperation with all social partners, all kinds of social and age groups, in particular by developing cooperation with schools, creative and professional organisations, promoting young people's interest in science and understanding of science and creativity as a basis for a successful career in any field of activity.

4.4. As it was mentioned in the Self-assessment report the research activities are of high importance for teaching staff of the study direction. But the motivation measures can be more systematic - this issue was highlighted during the meeting with the academic staff. Presently the motivation is possibility to get state funding and local and international research projects (for example, Interreg South Baltic Programme 2014-2020 in the project 'RBR - Reviving Baltic Resilience', Interreg Baltic Sea Region Programme Improving smart specialisation implementation of the Baltic Sea Region through orchestrating innovation hubs (Smart-up BSR) No. # R044 PP: 2017-2020, INTERREG Baltic Sea Region Programme 2014-2020 co-financed project No. R0 'Sustainable use of Baltic Seaweed' (GRASS), National research programme ECOSOC - LV project No. 5.2.9 'Impact of changes in social consciousness on the sustainable provision of ecosystem services' (2015-2018 et al.)), which is in fact related to private initiatives, i.e. the strategical trainings for competence in project proposal development, financial support for project proposal development were not provided.

In spite of that the lecturers and students of the direction participated in various stakeholder involvement and research support projects, such as the annual European Researchers' Night (Horizon 2020) events and evaluation of annual Pupils' Scientific Research Papers (ZPD) in Liepaja and Kurzeme region, as well as by executing research for the development of the Liepāja education environment (e.g. European Economic Area and Norway (EEA/N) Grant Programme 'Research and Education' 2020-2023 funded project 'Development of Innovation Centre in Liepaja City' (No. NFI/IC/VIAA/2020/2) 2); Projects supported by Liepāja City Council a) 'Natural values of Lejaskurzeme for the centenary of Latvia' - Knowledge Trail of Woody Plants at Liepāja Seaside Park and b) 'Nature Embassy at Liepāja University' etc.).

Another high potential for research activities development is the Circular Economics Centre, which participated in 7 international projects and presently participated in the Fundamental and Applied Research Project “Impact of COVID-19 on Sustainable Consumption Behaviour and Circular Economy”.

It should be stressed that due to involvement of non-DITI Environmental Direction employees, there is possibility to participate and introduce the research results of from other research areas, for example, Sustainability in University-City Cooperation , Environmental and Health Education Issues , Environmental Impact on Bat Populations, Microplastic Pollution in the Baltic Sea , etc. Having in mind that the high quality research results and competences are gained during such research programmes as Horizon2020, it is highly recommended to Liepaja University to work in this direction, i.e. look for collaborations and trainings to become a partner in Horizon Europe programme. This consequently leads to another area to be improved – the quality of the publications. As analysis of the publication list of the academic staff revealed the main research results are published in SCOPUS database, therefore it is highly recommended to apply to journals in Clarivate Analytics database in order to get the reviews of high competences and world known scientist and to measure the effectiveness of Liepaja University strategy for science and education.

The pedagogical and scientific achievements of the academic staff have gained recognition at the state and Liepaja City level, for example, a Certificate of Recognition from the Ministry of Education and Science of the Republic of Latvia for significant academic and popular research work in health education and a Certificate of Recognition from Liepaja City Board of Education for the contribution to the organisation and management of the work of the commission in the pupils’ scientific conferences of Kurzeme region (2014); a Certificate of Recognition from Liepāja City Board of Education for the contribution to the environmental education of students; the Liepāja Annual Award in Science 2019; a bronze medal in the exhibition of innovations and inventions MINOX 2018.

Also it should be stressed that during the reporting period, 3 lecturers of the direction have defended their doctoral theses.

In order to ensure the continuous improvement of the academic staff competences and to get higher research results, it would be reasonable to employ the main study direction academic staff on a permanent basis instead of yearly contract practice.

4.5. Students are welcome and encouraged to publish their research results together with their supervisors. Every year, students from all levels of study programmes are offered an opportunity to participate in the competition of research projects, where it is possible to receive financial support for the practical implementation of course papers and final theses. During the meeting with students it was obvious that students are aware of this opportunity:

- three students published scientific articles in SCOPUS database;
- students of the master's study programme “Ecotechnology” were in the international projects.

The activity of the students in the research fluctuates from year to year – the special positiveness to the area was noticed during the meeting with the programme’s alumni and some criticisms from the present students, therefore the programme managers and mentors are highly encourage to develop strategy how to involve the students to the scientific research activities.

4.6. The Self-assessment report indicates the innovations related only to students research activities, process of the ideas for the course works and the final thesis topics. It is highly suggested to apply the innovation activities in other processes of Liepaja University as well for example: admission, teaching methods (problem based learning, challenge based learning, etc.), competence improvement of academic staff (scientific cafe, trainings for project proposal development, etc.). Also systematic renewal/or integration of the new software used in the teaching processes (ArcGIS, SimaPro, etc.)

## Conclusions. Strengths and weaknesses

The main conclusions are the following:

Liepaja University has a good research culture in environmental studies - the professional bachelor's programme 'Environmental innovations technologies' and the professional master's programme 'Ecotechnologies'.

Experts found that in spite of that both programmes are professional, the research activities are performed on a good level, i.e. the academic staff and students take part in research projects, present their findings in national and international conferences and publish the results in national and international journals.

Analysis of the themes of the course works and final thesis defended in the previous years shows that the majority of them strongly correlate with the programmes goals and strategies. Also in many of them the actual business, regional and public problems were analysed and the solutions provided, which were implemented in the real objects.

The both programmes seem to be well organized and target oriented. But Liepaja University should elaborate on the development of an efficient continuous mechanism how to more actively involve teaching staff into higher level research activities, which will end up with higher level publications and better prestige of Liepaja University. Also special attention should be paid to new software and hardware, which will rise the competences of the teaching staff and the students, and will provide the advances in the competition with other universities in the study direction.

Strengths:

- 1) The presence of DITI Circular Economy Center, which is active in the participation in international projects and ensures continuous possibility to improve the research competences of the academic staff and the students;
- 2) Collaboration with the Technology Transfer Centre, Prototyping Centre, the Business Incubator of Kurzeme and Science and Innovation Park.
- 3) Liepaja University scientific institutes and research groups in departments - scientific teams perform interdisciplinary research with the focus on comprehensive solutions to actual scientific problems in cooperation with Latvian and foreign universities and entrepreneurs.
- 4) The students are involved in the research activities and encouraged to publish their research results together with their supervisors.

Weaknesses

- 1) The New Development Strategy for 2021 - 2027 of LiepU is still under preparation and there is no evaluation report for the strategy efficiency in order to avoid the mistakes;
- 2) the explanations about the newest research results integration into the teaching material and practical works are missing (the requirements to renew teaching materials, feedback from students, etc. are missing).
- 3) The reports, where the information publication profile and topics in connection with participation in conferences and scientific seminars by academic personnel presented are only in Latvian language;
- 4) There is no system for the teaching staff motivation to improve research and teaching competences;
- 5) There is no strategy on how to involve the students to the scientific research activities.
- 6) There is no strategy to renewal/or integration of the software/hardware used in the research processes.

## 5. Cooperation and Internationalisation

### Analysis

#### 5.1

Liepaja University has created a network of collaborators through the signing of:

1. Agreements of Mutual Cooperation for the implementation of the Programs of Study under evaluation (i.e. MSc in Ecotechnologies and BSc in Environmental Innovation Technologies). These agreements pertain mainly to the internship/traineeship component of their programs of study.
2. Bilateral Agreements through the EU Erasmus+ Programme.
3. Agreements with other universities for cooperation in teaching and in research, including several organizations from Latvia.

Despite the fact that the information provided through the self-assessment report indicated that there is a total of 21 such agreements that have been signed and that are currently in effect, updated information provided to the evaluation committee via a Question & Answer session yielded the following information:

- Erasmus Cooperation agreements in effect - 12
  - o Number of different countries - 10
- Cooperation Agreements for practical training
  - o Universities - 5
  - o Companies - 39
  - o Governmental (local and national) agencies - 14
- Cooperation Agreements for research + Cooperation Agreements for teaching -10.

From data supplied by Liepaja University in their self-assessment documents,

- more than 40 “Environmental protection” students made use of outgoing student mobility programmes during the years 2016-2021 to about 14 different universities and other organizations (i.e. commercial companies). These universities and organizations are different (with the exception of a Lithuanian university) from the ones with which a cooperation agreement has been signed. Attestations, during the visit interviews, of students who had participated in the outgoing mobility programme were positive, with regards to the procedures and support that they had received from the institution.
- More than 30 students used the incoming student mobility programmes during the years 2016-2021. These students came from two EU countries; two students came from Portugal (studied under the BSc programme) and the rest were from Lithuania (studied in the MSc programme).
- 26 guest lecturers from five different countries (Lithuania, Sweden, Turkey, Bulgaria, and Russia) visited Liepaja University during the period of 2016-2021.
- No outgoing faculty members were listed for during the same time period.

All of the aforementioned partners appear to have been selected based on the specific features of the study field and the relevant study programmes.

Additional information was provided to the evaluation committee upon specific request. The data provided were as follows, which may contradict some of the information presented above:

- Outgoing Mobility - Undergraduate Students (old program of study):
  - o 2016/2021 - 7 (studies)
- Outgoing Mobility - Graduate Students:
  - o 2016/2021 - 20 (internship)
  - o 2016/2021 - 9 (studies)
- Incoming Mobility - Undergraduate Program of Study (old program):
  - o 2016/2017 - 2 (studies) (Note: no incoming students since 2017)
- Incoming Mobility - Graduate Students
  - o 2016/2021 - 20 (internship)
  - o 2016/2021 - 9 (studies)

· Outgoing Mobility – faculty members

o 2016/2017 – 3

o 2017/2018 – 1

o 2018/2019 – 1

o Note: As noted by the university, in the past 2 years outgoing mobilities have not been possible because of Covid-19 epidemiologic situation. Before that there have been teaching staff using Erasmus+ mobility programme, although only one staff member goes abroad each year. This is not because staff members are not encouraged to participate, it's because most of them are working in several educational institutions, therefore it is hard for them to find some free time where to squeeze in the mobility so it doesn't affect their work in other institutions. The International Relations Office is promoting staff members to participate in Erasmus+ programme through webpage, social media and staff meetings. The amount of Erasmus+ mobility grant Liepaja University has received allows everyone who fulfills the minimal requirements to use the mobility opportunity.

The University's International Relations Office is making informative seminars about the Erasmus+ Programme twice a year and talks about the mobility opportunities with separate student groups when requested. There are student experience stories published on Liepaja University website and social media frequently to encourage other students to take part in Erasmus+ programme. Students are getting full support when filling out the application documents and given advice about getting insurance, finding accommodation and preparing visa documents if necessary.

Considering the student population of Liepaja University, and especially the population size in the relevant study programmes, this list of partner institutions, as well as the number of students participating in mobility programmes, can be characterized as adequate. Also impressive was the number of incoming lecturers. Some of the outgoing mobility destinations could be scrutinized slightly more carefully (when searching for some outgoing mobility organizations, no solid information could be located. However, clarifications were provided by the university when requested.).

What could receive more attention by the university are the following:

1. the engagement of resident faculty members in outgoing mobility programmes,
2. a diversification of the population of incoming mobility students,
3. an increase in the population of incoming mobility students participating in the undergraduate program of study
4. a further expansion of the network of collaborators, especially at the international level, which could thus provide even more opportunities for students and faculty members, alike.
5. a better scrutiny of the quality of some of the outgoing mobility destinations
6. an enhancement of the number of cooperations that focus on research, instead of limiting the cooperation on internships and teaching.

5.2

Liepaja University has developed an Internationalization Plan, which was provided to the evaluation committee. The importance of attracting teaching staff and students from abroad is clearly stated in their Self-Assessment report. The incoming lecturers' and students' numbers are an indicator of the success of incoming mobility programmes.

The number of permanent and visiting lecturers from abroad (participating in the relevant programmes of study) is currently limited to a single visiting instructor from Lithuania, who currently teaches in the MSC in Ecotechnologies programme of study. The contribution of this instructor seems to be positive.

23 foreign students (their majority being from Pakistan) have been reported as having studied in the same programme of study.

However, from discussions with program coordinators and the Liepaja University Administration, what seems to be currently lacking is a specific approach through which the international population

of students can be maintained / enhanced and diversified.

### 5.3

Liepaja University has a significant Internship component in the Programs of Study under evaluation, amounting to 26 credits (out of a total of 162 program credits) for the BSc Programme of study, and 6 out of 60 credits for the MSc Programme of study.

There is a very specific mechanism through which these internships are guided and monitored. Based on information supplied by the University, an internship supervisor is dedicated to this effort. The specific rules for participation in an internship are made available to students early during the procedure, including all pertinent documentation that will be subsequently required. There is a multitude of readily available documents that detail the overall process and thus provide guidance to students.

The evaluation of students for this effort also receives a very structured approach. Specific tasks are indicated in the descriptions of study courses. The experience of students is enhanced by internship seminars that prepare students for the hands-on experience. During the internship, students are required to design and discuss an individual research project. The overall grading of each student's internship effort consists of an evaluation by the internship mentor on practical daily activities, and the rating of the Liepaja University internship supervisor on participation in seminars, as well as the rating of the student's self-analysis and presentation in the final seminar.

In parallel, the University has established a good network of partners (companies, public agencies, and NGOs) geared towards the implementation of the student internship. Pertinent agreements are kept between the university and industrial partners, as well as between students and the university. During the internship, a mentor (internship supervisor from the host company/organization) is appointed to each student so as to provide professional support during this effort.

Finally, students have the option to pursue their internship abroad, through the Erasmus+ Programme, in coordination with the Liepaja University Foreign Affairs Department.

### 5.4

Not applicable. No joint study programmes are currently implemented, Some initial discussions that started under the umbrella of an Erasmus Mundus Programme did not continue to a degree worth detailing in this report. According to Liepaja University, this effort may resurface in the future, if conditions become more favorable.

## **Conclusions. Strengths and weaknesses**

Liepaja University has managed to position itself centrally in the city of Liepaja in the general field of Environmental protection. They have created a network of collaborators (local companies and municipal/governmental organizations, as well as NGOs) through which they have managed to implement a successful internship program within their undergraduate and graduate Programs of Study. However, what seems to be currently lacking may be a more international outlook for the fields of study under evaluation. The exchange of knowledge and experiences among students and faculty members from different countries, although recognized by the University as important, still needs to be further reinforced and more systematically explored.

### Strengths:

The analysis produced the following conclusions with regards to the strengths of Liepaja University, and the specific programs of study under evaluation, for the category of "Cooperation and Internationalisation":

A good network of local collaborators has been established, especially as these relate to the implementation of student internships during their studies.

A solid Internship program has been incorporated in the undergraduate and graduate Programs of Study.

The procedures that accompany the internship efforts are detailed and adequate.

The internship effort is well monitored and well implemented, yielding valuable experiences to students.

#### Weaknesses

The analysis produced the following conclusions with regards to the weaknesses of Liepaja University, and the specific programs of study under evaluation, for the category of "Cooperation and Internationalisation":

Very low Erasmus mobility activity among faculty members (related to both incoming and especially to outgoing mobility)

Low number of EU-based partnership agreements under the Erasmus Program.

Poor scrutiny of the quality of outgoing mobility destinations.

Low number of cooperating institutions in the field of research.

Low number of visiting faculty members from abroad.

## **6. Implementation of the Recommendations Received During the Previous Assessment Procedures**

### **Analysis**

In 2015, the study direction 'Environmental Protection' with 2 study programmes was accredited for six years (accreditation sheet No. 351, 6.10.2015); the report of the expert group of the direction evaluation. Listed recommendations for the further development of both programmes and the direction as a whole (for a list of recommendations and a description of the Department of Nature Sciences and Engineering appropriate actions, see Annex to Self-assessment report II.6.2.A\_ Execution of expert recommendations).

The main critical remarks of the experts in "Experts joint report of previous assessment (2015)" are related to the

provision of study and research environment infrastructure;

for lecturers' research - the need a) to overcome the fragmentation of topics by integrating them in accordance with the content specifics of the programmes, b) to promote the development of research activities (publication in internationally peer-reviewed/cited publications, number of publications);

stakeholder communication and cooperation (involvement in programme development and evaluation: feedback);

wider integration of the English language in the study process (essential for the internationalisation of the study process, including cooperation with foreign HEIs, attraction of foreign students; also for raising the pedagogical qualification of lecturers).

Recommendations influencing the quality of studies provided by previous accreditation experts of the study direction have been implemented, as a result of which

a) infrastructure of the research and study environment has been improved (equipment of the Environmental Chemistry Laboratory and Eco-technology Laboratory has been supplemented, additionally 2 new laboratories have been established - Prototyping Laboratory and Paper Recycling Laboratory),

b) teachers have published in internationally peer-reviewed/cited publications in environmental science, including research results in their supervised courses

c) for the wider integration of English into the study process, lecturers study English in depth within the specific target support project(SAM), guest lecturers from Klaipeda University are invited, joint student scientific conference (students must publish in the collection of scientific articles, represented at the conference) has been organised annually by universities of Liepaja and Klaipeda,

in the last two years the University of Cadiz (Spain) has also been invited;

d) communication with partners and students is carried out for the further development of programmes in the study direction and implementation of feedback in the quality control of studies is implemented.

Besides, when implementing the expert recommendations expressed in the accreditation of the study direction 'Environmental Protection', changes were made in the study plan of SP 'Ecotechnology', by additionally including new study courses and restructuring the previous ones, as well as the developed and licensed (10.02.2021) professional bachelor's study programme 'Environmental Innovation Technologies', which will replace the programme evaluated in the previous accreditation 'Environmental and Renewable Energy Resources Management and Engineering'.

In 2021 licensed (10.02.2021) professional bachelor's study programme 'Environmental Innovation Technologies', which will replace the programme evaluated in the previous accreditation 'Environmental and Renewable Energy Resources Management and Engineering'.

Short-term recommendations to be made before the SKK meeting, which will decide on the licensing of the study programme are done:

1. Supplemented the description of the study course "Applied Communication" with the evaluation criteria.
  2. Supplemented the study course "Introduction to studies, research and technology", "Environmental and civil protection", "Staff management", "Environmental engineering foundations", "Environmental technology II", "Electronics", "Environmental monitoring", "Environmental impact assessment", "Rural practice" and "Practice I" with mandatory literature (section "Basic materials") in English.
  3. Updated the list of mandatory literature in the description of the study course "Office Software".
- There is too short a time period from licensing to evaluate long term recommendations.

## **Conclusions. Strengths and weaknesses**

The recommendations provided during the previous procedures for the assessment of the study field have been partially implemented. The Liepaja University has contributed to the analysis of the recommendations and their implementation in view of the specific features of the study field and the relevant study programmes. There is evidences of implementation, but still there is need for further improvement.

Strengths:

There is evidences of provision of study and research environment infrastructure;  
Stakeholders are involved in programme development and evaluation;  
Integration of the English language in the study process is in progress.

Weaknesses

study and research environment infrastructure is available individually for active students, but not groups of students;  
The Paper Recycling Laboratory need to switch focus from art to industrial prototyping and innovations;  
There is weak evidence of research integration in study process;  
Stakeholders do not show strong evidence of willingness to employ undergraduate students;  
There is need to promote academical staff publication of research results.

## 7. Assessment of the Requirements for the Study Field

- 1 R1 - Pursuant to Section 5, Paragraph 21 of the Law on Institutions of Higher Education, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their internal quality assurance systems:

**Assessment of compliance:** Partially compliant

**Justification:** The LiepU supports internal quality assurance system oriented on continuous improvement, development and performance of the study field "Environmental protection". The quality system formally is applied, but it lacks important elements such as scientific activity, that are critical for higher education.

- 2 1.1. The higher education institution/ college has established a policy and procedures for assuring the quality of higher education.

**Assessment of compliance:** Partially compliant

**Justification:** LiepU has established policies and arrangements to ensure the quality of higher education. The quality system formally is applied, but it lacks important elements that are critical elements of higher education. Close links between scientific activity and studies have not been identified. There is no clear system of motivation for the involvement of teaching staff in scientific activities.

- 3 1.2. A mechanism for the development and internal approval of the study programmes of the higher education institution/ college, as well as the supervision of their performance and periodic inspection thereof has been developed.

**Assessment of compliance:** Partially compliant

**Justification:** A mechanism for the development and internal approval of LiepU curricula has been developed, but the enforcement and periodic monitoring mechanism has not been sufficiently developed. There is no assurance that the established quality system is fully used as written and there is a lack of clear measurements.

- 4 1.3. The criteria, conditions, and procedures for the evaluation of students' results, which enable reassurance of the achievement of the intended learning outcomes, have been developed and made public.

**Assessment of compliance:** Partially compliant

**Justification:** Criteria, conditions and procedures for evaluating student outcomes have been developed and published to ensure that learning outcomes are achieved. However, during the expert visit it was concluded that not all teaching staff have put this system in practice. Statistical data on both study programs of the study field are available for internal use in LiepU and, according to the results of the interviews, are not efficient enough to be able to perform qualitative and sufficiently quantitative measurements.

- 5 1.4. Internal procedures and mechanisms for assuring the qualifications of the academic staff and the work quality have been developed.

**Assessment of compliance:** Fully compliant

**Justification:** Internal procedures and mechanisms have been developed to ensure the qualifications and quality of work of academic staff. But an analysis of the qualifications of academic staff concluded that a large proportion of guest academic staff have low scientific activity.

- 6 1.5. The higher education institution/ college ensures the collection and analysis of the information on the study achievements of the students, employment of the graduates, satisfaction of the students with the study programme, efficiency of the work of the academic staff, the study funds available and the disbursements thereof, as well as the key performance indicators of the higher education institution/ college.

**Assessment of compliance:** Partially compliant

**Justification:** The LiepU does not ensure the collection and analysis of information on the achievements of students' studies, the employment of graduates, the satisfaction of students with the study programme, the effectiveness of academic staff work, the available means of study and their costs, as well as the core performance indicators of the LiepU. However, the information is incomplete and mainly based on the principles of voluntary reporting.

- 7 1.6. The higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their quality assurance systems.

**Assessment of compliance:** Partially compliant

**Justification:** The LiepU ensure continuous improvement, development and effective functioning of the field of study, while at the same time introducing quality assurance systems. During the expert visit, it was concluded that quality systems were formally implemented and not all guest teaching staff were informed of them. The system needs to be improved with more measurements and indicators to monitor the quality of studies and the competitiveness of graduates in the labour market.

- 8 R2 - The cooperation with different organisations from Latvia and abroad implemented within the study direction ensures the achievement of the aims of the study direction.

**Assessment of compliance:** Partially compliant

**Justification:** The Liepaja University has managed to position itself centrally in the general field of Environmental Protection of Liepaja City. They have set up a network of collaborative centres through which they have managed to implement a successful traineeship programme in their study programme. There is a lack of an international perspective on the areas of study to be assessed.

- 9 R3 - Compliance of scientific research and artistic creation with the development level thereof (if applicable).

**Assessment of compliance:** Partially compliant

**Justification:** The experts found that research activities of Liepaja University are carried out at a satisfactory level. However, the Liepaja University should develop an effective continuous mechanism for more active involvement of teaching staff in high-level research activities leading to higher-level publications and better Liepaja university prestige.

- 10 R4 - Elimination of the shortcomings and deficiencies identified during the previous assessment of the study direction, if it has been conducted, or the implementation of the provided recommendations.

**Assessment of compliance:** Partially compliant

**Justification:** The recommendations provided during the previous procedures for the assessment of the study field have been partially implemented. The Liepaja University has contributed to the analysis of the recommendations and their implementation in view of the specific features of the study field and the relevant study programmes. There is evidences of implementation, but still there is need for further improvement.

## 8. Recommendations for the Study Field

### Short-term recommendations

It is necessary to find a unique and focused education niche in environmental sciences that ensures the competitiveness of graduates in the labour market;

Parts of the course laboratory works need to be reinforced and should be combined with the upgrading of the equipment concerned in order to meet these needs;

The classroom must bring field research experience, especially from elected faculty members.

## Long-term recommendations

Promote national and international cooperation with other educational institutions in order to ensure the sustainability and development of the programme;

The elements that are considered to be key to engineering education should be developed, thereby contributing to the competitiveness of graduates in the labour market;

It is necessary to develop and develop engineered or technological identities;

The issue of "ownership" and quality of study courses needs to be resolved. In order to maintain this practice, it is also necessary to introduce a control mechanism in order to avoid the negative effects mentioned above;

Purchasing software and upgrading available software to provide students with market-oriented skills;

The mechanism for using student/graduates/employers feedback should be more efficient and effective;

Additional approaches and resources are needed to maintain and update the material-technical base in the long term, which is essential for the acquisition of innovative knowledge;

Regional cooperation with companies should be developed in the provision of a technical and technical basis and in the use of equipment at the disposal of companies to ensure the training process;

The scientific activities of teaching staff should develop and implement a clearly defined motivation system;

The attraction of full-time academic staff to study programmes motivated by scientific research and their integration into the study process should be promoted.

## II. "Environmental innovation technologies" ASSESSMENT

### II. "Environmental innovation technologies" ASSESSMENT

#### 1. Indicators Describing the Study Programme

##### Analysis

The establishment of the "Environmental Innovation Technologies" professional bachelor's study programme (hereinafter - study programme) is in line with the objectives set out in the Liepaja University strategy for 2014-2020 and is considered to be an element in achieving these objectives. During the evaluation of the study programme, the strategy expired, but information from the management of the Liepaja University was received that the strategy was extended and approved until 2022. The course of the approval of the strategy is closely linked to the development of documents at national level and in coordination with the Ministry of Education and Science.

The study programme will help to achieve the mission set out in the Liepaja and Kurzeme region Strategy, "To be a facilitator of education, science, innovation and cultural development in Liepāja and Kurzeme, which provides competitive, regional development-required, governmental and internationally important studies, implements research-related, governmental and internationally-recognised research and contributes to the sustainable development of society." During the expert visit, foreign students were found to be taking advantage of the opportunities offered by the study programme.

The implementation of the study programme in English corresponds to the objective set out in the Liepaja University strategy and harmonises with the guidelines of the Latvian National Development Plan 2021-2027, which focuses on the knowledge society, the climate-neutrality “Green Course” and the circular economy. The English study programme will not only ensure the attraction of foreign students, but will open up the possibility of attracting foreign guest lecturers who will contribute to the quality of the study programme, in the field of environmental technology innovation.

A professional bachelor’s degree in environmental engineering and the qualification ‘Environmental Engineer’ can be acquired in the programme.

Similarly, the study programme will enable Liepaja University to reach the ultimate goal of “Providing research-based, regional, competitive and high-quality opportunities for higher vocational, academic education and lifelong learning, promoting the development of an economy based on knowledge and professional competence and the strengthening of a creative, cultural society.” The purpose of the study programme is to prepare competitive specialists in the field of environmental engineering, who:

- (a) focus on current environmental technologies and their innovation; and
- (b) are able to apply them to specific situations in companies and institutions in order to mitigate environmental impacts and save resources; and
- (c) are capable of producing the corresponding innovations. The results of studies planned by the study programme are in line with its objectives and objectives, as well as the planned results of study courses dedicated to the training of highly qualified and competent specialists with a broad understanding of the sector's issues and the ability to work for its development, creating innovative solutions with real added value and managing the implementation of such solutions in life. The objectives of the study programme are directly subordinated to the purpose of the study programme and are logically linked to the expected results of the study, where the integration of rolling skills into the objectives of the study programme and the expected results of the studies should be marked as a positive moment.

The aims, objectives, learning outcomes, and admission requirements of the programme formally are interrelated and in accordance with regulatory requirements.

### **Conclusions by specifying the strengths and weaknesses**

The study programme is well-founded and is in line with the course of studies in which it is intended to be incorporated and with the strategic objectives of the Liepaja University, as well as building on trends in the EU and the global environmental sector and labour market demand. The content of the study programme has been developed in the management of teaching staff, taking into account the developments of the sector, including the views of students on the organisation of the study process. However, the involvement of professionals in the sector is not fully exploited and the study programme does not, or only partly, include the acquisition of technical knowledge relevant to the specific characteristics of the sector. Its development takes into account the dynamics of the number of students in the existing bachelor's study programme “Environmental and Renewable Energy Management and Engineering” and analyses the possibilities for attracting foreign students. The aims, objectives, learning outcomes, and admission requirements of the programme formally are interrelated and in accordance with regulatory requirements.

Strengths:

1. The study programme has broad opportunities for developing growth and competitiveness through cooperation with other educational institutions, both nationally and internationally.
2. The education acquired in the study programme is comparable to that obtained in other countries of the European Union, thus allowing extensive mobility of students and teaching staff.
3. The study programme has extensive opportunities for growth and competitiveness development,

extending the range of specialisations proposed and strengthening Liepaja University as a high-spectrum environmental specialist training centre in the Kurzeme region.

4. The parties involved in the development of the study programme (employers, teaching staff) positively assess the importance of involvement and the willingness of the university to implement the supplements and proposals to the study programme, but they are not sufficiently familiar with the actual content of the training programme developed.

#### Weaknesses

1. International and national cooperation with other educational institutions has not paid sufficient attention to ensure the sustainability and development of the programme;

2. A very narrow educational niche for environmental sciences has been identified for the implementation of the study programme, which can threaten the implementation and development of the study programme in the long term.

## **2. The Content of Studies and Implementation Thereof**

### **Analysis**

#### Analysis

##### 2.1

The University provided detailed information on the study programme, including a semester-by-semester break-down of courses, an indication of the category of each course (e.g. free electives, technical electives, etc.) and an outline of each course. However, it should be noted that the evaluation process was hampered by the fact that during the committee's site visit the most of the available faculty members were not elected members but rather visiting or contracted faculty. Several of the questions posed by the committee were superficially answered.

The course outlines submitted in the self-assessment package conform to a uniform standard, however, some course outlines lack in content (e.g. provide the majority of their literature sources in Latvian, as opposed to English).

The study programme that leads to the BSc Degree in Environmental Innovation Technologies consists of 162 Credit Points (CPs), where each CP corresponds to 1.5 European Transfer Credit System (ECTS), and it fully conforms to the State Education Standard, as this was explicitly indicated in the Self-Assessment report. The study programme provides a broad coverage of many of the topics encountered in the field of Environmental Sciences, and, according to the data provided by the University, it conforms to the requirements set by the Vocational Standard of "Environmental Engineer", as this was set in 2005 by the Latvian State. The study programme was evaluated and licensed under the vocational standard of "Environmental Engineer". In addition, it was stated that the director of this study programme participates in the work group responsible for the development of the vocational standard of "Environmental Engineer" in Latvia.

The study programme also includes a significant Internship component, allowing students to partake in real-life experiences before graduation.

The overall objective of the study programme, as stated by the University in its Self-Assessment report, is to prepare competitive specialists in the field of environmental engineering who focus on current environmental technologies and their innovations and are able to apply them to specific situations in companies and institutions to reduce environmental impact and save resources, while creating appropriate innovations.

The content of the study programme, according to Liepaja University, were designed to provide

education that ensure the provision of the competencies necessary for environmental engineering and environmental management tasks, such as the development and design of environmental technologies, and environmental management competencies, as these apply to environmental politics, circular economy, environmental communication and ethics. In addition, the study programme claims to provide the knowledge and skills necessary for starting a business, as well as develops non-standard problem-solving competencies, looking at such innovative areas as ecotechnology, biomimicry and biotechnology. The stated ultimate goal of the study programme is to provide wide career opportunities, in different types of companies and institutions, to its graduates.

The study programme was developed while consulting with industry experts (e.g. companies and governmental/municipal agencies), with the intention to capture the development trends and the labour market in the field. This cooperation between the university and industry experts is envisioned to continue throughout the implementation of the study programme. An important positive component of the programme of study is the emphasis that is placed on the internship that students are expected to complete during their studies.

From answers obtained by the University, the Program's graduates should be considered "specialists in companies who are responsible for environment-related things from technical viewpoint and can do the associated paperwork too. Most of the companies where our students find employment aren't big and aren't interested in specific professions, but persons who can do specific tasks which they need."

An analysis of the information provided by the University, through their self-assessment report and through the answers to questions posed, indicates an ambitious attempt to cover "most" of the areas that may be associated with the broad field of Environmental Studies. While this attempt is, in principle, valuable, at the same time it creates question-marks with regards to the actual identity and competitiveness of the Program's graduates, in an international setting, as Environmental Engineers. It seems that while the study programme covers a wide area of elements in environmental studies, at the same time it dilutes the technical elements and competencies that should characterize an engineer. This is a contemplation that should be addressed by the University, especially if their goal (implicitly indicated by the fact that they will be offering this study programme in English) is to attract an audience that will later attempt to work as Environmental Engineers outside of the narrow bounds of Liepaja. What comes under question is not the merits of the study programme as is, but instead the contradiction of what the study programme claims to be, especially with regards to the Environmental Engineering profession.

Some simple examples of how the aforementioned statements can be supported include the following:

- 1) the mathematics content in the study programme appears scant, for an engineering-gearred program of study. When challenged by the evaluation committee on this item, the university representatives responded by saying that specific mathematical concepts are also incorporated in subsequent technical courses in the Program. However, such an approach may serve to dilute other "technical" courses in the study programme, instead of reinforcing the mathematical background of students

- 2) the design-specific courses in the study programme are almost non-existent. While several courses claim to include design elements in environmental technologies, this is poorly justified when examining the course content holistically. For example, it is debatable that a graduate will be able to apply any design elements in such fundamental areas as Water and Wastewater Treatment with only 6 hours of lecture background in Hydraulics. If, for example, one compares an Environmental Engineering graduate from a USA or UK university, the anticipated norm in competencies is widely different from the one offered through this study programme.

- 3) the sequence in which some topics are introduced within the study programme, create doubt as to the content and the level to which knowledge is attained, as this is claimed through the course

descriptions. For example, the introduction to principles of air pollution control in the very first technologies course may be too taxing to students, to the degree that they may not be able to fully attain the knowledge sought.

4) the laboratory component of courses is rather scarce, especially as this pertains to basic environmental engineering processes. For instance, when the university representatives were asked about the extent of practical (laboratory) work in technical courses (e.g. “do students get the opportunity to carry out laboratory tests relating to water and wastewater characterization and treatment?”), the response received indicated that such laboratory exercises are conducted in the specific courses of “Environmental Technologies I” and “Environmental Monitoring”. The course outlines of the aforementioned courses did not include a laboratory component. This example creates a serious discrepancy with regards to the information supplied to the evaluation committee.

5) Interviews with graduates of the (old) programme of study could not be used to make any further deductions on this item. However, it should be noted that when a programme graduate who already holds a different engineering degree was asked: “if you were not already an XXX engineer, do you think the degree on its own would conform to the professional standard” the response was “not really”. Another graduate characterized the degree as “a life sciences degree rather than engineering”.

6) Another interesting piece of information that came from interviews with graduates during the site visit was the fact that about 50% of graduates of the (old) study programme pursued a career outside of the “field of study” (this information was the result of contact through time that the graduate kept with his classmates). No official data on the subsequent career of programme graduates was provided by the university (instead, a reference to the National data collection system was made).

The study programme formally correspond to the requirements of the vocational standard but there is lack of engineering dimension.

The descriptions of the study courses (including those for traineeships and the final thesis) are of high quality and comply with the provisions set forth in the regulatory enactments.

## 2.2

The study implementation methods (including evaluation methods) contribute to the achievement of the aims and learning outcomes of the study courses, as these are listed in the course outlines. However, the overarching question as to whether the study programme leads to the self-proclaimed engineering skills still remains.

Courses are taught through a variety of approaches, including lectures, seminars and workshops. Assignments and evaluation methods used in courses go beyond the standard examination paper but instead extend to widely include projects and presentations. Diverse methods of communication are used (as attested during interviews with students). Also, students feel their interactions with their professors to be frequent and positive. All of the aforementioned ensure a more student-centered learning approach.

The laboratory component of courses is limited (as reflected in the course outlines), as well as the capacity of the laboratory facilities (this was deduced from the site visit of the committee). This limitation can have negative connotations for the education of engineering students.

Another area that could be improved in the study programme is the more systematic use of appropriate software in courses. Whenever software was needed for the teaching of courses, there have been accounts, by faculty and students alike, of outdated or substandard software being used (e.g. use of open-source freeware with limited capabilities, or use of old software, instead of the university investing into newer and more professional software).

During interviews with students in the study programme, the following three additional points surfaced:

1) students would have liked to have professors who can share more of their “field experience” during lectures, as opposed to limiting themselves to giving “theoretical” lectures.

2) the use of technology (especially Moodle) in the teaching of courses is still limited and it was attributed to the fact that “faculty members are not very experienced with this type of technology”.

3) Students seem to have a misconception of what “research” is. During the meeting with students, there was a widespread use of the term, and when asked (if their professors involve them in research), they seemed to refer to “literature review” as “research”, often ignoring the other components of real research (e.g. lab work, data analysis, discussion and drawing of conclusions)

### 2.3

The university conducts three types of surveys: 1) among students, 2) among graduates of the (old) program of study, and 3) among employers.

1. Students Surveys: according to the self-assessment report, surveys of students were conducted at the end of each study year, covering students of all courses. During the site-visit, it was stated that student surveys are not conducted for all courses every year, but instead there is a selection of courses. A rudimentary summary of the results of these surveys were provided to the committee upon request, yet the information was in Latvian, hence it could not be scrutinized.

2. Graduates surveys: it seems that there is no formalized means of surveying graduates. Low response rates are also reported for during times when such surveys were conducted.

3. Employers surveys: have been formalized through regularly interviewing student’s internship supervisors. This ensures a specific frequency of feedback received from the industry, as well as a variety of employers. However, no formal instrument (e.g. questionnaire) that may be used for these surveys was presented to the committee.

Based on specific information presented in the self-assessment report, the university has made specific use of information received from the aforementioned surveys, especially when it pertains to the restructuring of the old programme of study and the construction of the new study programme.

### 2.4

The students avail themselves of the incoming and outgoing mobility opportunities, and the learning outcomes achieved during such mobility are recognized. The university has a good support system for Erasmus+ students. This was described in the self-assessment report, it was clarified through written responses to questions asked by the committee and was emphasized by students during the site-visit and the meeting with students. The university has procedures in place, which are followed and has also made an attempt to identify avenues (other collaborating universities) for students to take courses that count towards their programme of study. Several students have taken this opportunity and have commented positively on the whole experience.

## **Conclusions by specifying the strengths and weaknesses**

Liepaja University has created a study programme in Environmental Innovation Technologies that provides a wide range of elements necessary for today’s graduate in the field of environmental sciences and environmental protection. The programme adheres to the national vocational standard for environmental engineering. The programme is supported in a manner that is conducive to student-centered learning, and it employs a multitude of teaching methods and student evaluation methods. At the same time, the programme of study is quite different from most other environmental engineering programmes in Latvia and abroad. The difference is the little emphasis on mathematical, technical, and practical components in an engineer’s training curriculum that this study programme maintains. This fact may, for one, affect the study programme in attracting international students who may want to later get licensed as environmental engineers in their respective countries. It may also affect the employability of their graduates within the specific field of environmental engineering, and instead drive them to have a career change in more tangential fields (the study programme may be lacking a solid identity). Further, the study programme would benefit from a reinforcement of the laboratory component of courses, as well as an enrichment of courses with more modern software, and their practical usage. Finally, the university may want to

reevaluate the approach that they want to maintain with regards to personnel employed in teaching certain courses, hence reinforcing the practical aspects of engineering by upgrading the basis of their elected personnel, by creating a sense of ownership of courses that maintain a central spot in the curriculum.

#### Strengths:

The strengths of the study programme (Environmental Innovation Technologies) leading to the Professional Bachelor's Degree in Environmental Engineering are the following:

A multidisciplinary approach provides a wide view of the items revolving around environmental sciences and technology to students.

The study programme has attained the Latvian vocational standard for environmental engineering. The teaching methods employed allow for the better development of certain valuable skills (e.g. communication skills) among students.

The implementation of the study programme creates an environment conducive to learning.

The study programme includes a strong Internship component.

Student mobility is encouraged and supported.

The opinions of students and employers have been considered in the development of the study programme.

#### Weaknesses

The following items could be considered as suggestions for further improvement of the study programme leading to the BSc degree in Environmental Innovation Technologies:

Loose coverage of technical skills that engineers should possess (based on international experience).

Key elements of engineering education are superficially covered.

The study programme is lacking an engineering or technology-oriented identity in the eyes of professional engineers (creating a dichotomy in "what-the-study-programme-is" versus "what-the-study-programme-claims-to-be"). This may limit graduates to careers that are peripheral to engineering.

Laboratory components of courses are limited, as well as the capacity of laboratory facilities.

Elected faculty members do not bring adequate "field experience" into the classroom (not to a level that is expected from an engineering study programme).

The intense use of guest instructors poses the question of course "ownership" and course content/delivery quality.

Lack of use of essential modern software in the teaching of courses.

Course outlines may not always reflect the true contents of courses.

Course contents are sometimes "spread thin", meaning that they incorporate a large number of topics that are introduced to students in a very limited amount of time.

Courses often have little connection to one another (especially with regards to prerequisites), which hampers the programme flow, despite the fact that it allows certain flexibility in the offerings of courses.

Literature used in courses extensively uses resources in the Latvian language.

Surveys of student/graduates/employers are not formalized (i.e. do not use specific tools/questionnaires) and are not administered systematically.

Inefficient and ineffective (i.e. a formalized rather than an ad-hoc approach) mechanism of using feedback from students, graduates, and employers.

### 3. Resources and Provision of the Study Programme

## **Analysis**

The necessary material and technical provision and staff have been identified for the implementation of the study programme, but on the basis of the information received during the meeting with Liepaja University representatives and teaching staff, it is limited to the possibility of participation in scientific research and to acquire international experience which is very relevant for the implementation of the developed study programme, particularly in view of its pursuit of innovation creation and implementation. As well as the implementation of the study programme, international and national mobility is essential, ensuring continued capacity building for teaching staff and their compliance with labour market requirements, but this dimension is not addressed in the study programme's description. Several Liepaja University departments are involved in the implementation of the study programme. The study programme is supervised and overseen by the Nature and Engineering Faculty. The study process is provided in cooperation with the Faculty of Pedagogy and Social Work, the Faculty of Humanities and Arts Sciences, the Faculty of Management and Social Sciences and the Institute of Natural Sciences and Innovative Technologies. During the expert visit, it was found that the department responsible for providing the teaching of a given study course was responsible for the content of the study course and for its realisation. It was also found that support staff in training laboratories providing support during laboratory work was provided, but the involvement of students in scientific activities at the Institute of Natural Sciences and Innovative Technologies is a case-by-case nature where the student should show interest and agree with the management of the Institute on the use of equipment in the work of a bachelor.

## **Conclusions by specifying the strengths and weaknesses**

The material and technical basis available for the initial implementation of the programme, laboratory equipment and equipment shall be suitable for the specificity and implementation of the study programme. However, there is no clarity on the long-term feasibility of providing a technical base. Financial resources shall ensure that the results of the study programme are achieved and this is confirmed by the internal financing documents governing the use of Liepaja University. The information and methodological basis shall be sufficient to ensure that the study programme is carried out. The literature available in the library provides the basic needs of the study programme, but regular updating of the current literature needs to be carried out.

Strengths:

1. The material engineering base of studies provides opportunities to provide appropriate and professional studies at bachelor's level.

Weaknesses

1. There is no clear approach and resources to maintain and update the material-technical base in the long term, which is essential for the acquisition of innovative knowledge.
2. There is no considerable opportunity to promote regional cooperation with companies in the provision of a technical and technical base and the use of equipment at the disposal of companies to ensure the training process.
3. There is no clearly marked system of motivation for the scientific activities of teaching staff.

## **4. Teaching Staff**

## Analysis

4.1 During the reporting period the study programme “Environmental and Renewable Energy Management and Engineering” providing the professional bachelor's degree in environmental sciences and the professional qualification of an environmental management specialist or environmental engineer has been replaced by the study programme “Environmental Innovation Technologies” with only one professional bachelor's degree in environmental engineering and only one professional qualification - environmental engineer. According the strategy Liepaja University composes the academic staff accordingly to the main competences, which the programme should ensure. It means that programme modules composition should ensure adequate qualification for graduates. Therefore the composition of the lecturers has been changed in accordance with the specifics of the new programme.

Analysis of the programme structure revealed that the main courses remained the same as in the previous programme. The new programme developers took into account tendencies, recommendations of the students, alumni and other stakeholders and increased the number of courses for practical skills development. Due to this new academic staff members were invited, for example: Landfill specialist from SIA “Liepājas RAS”, environmental monitoring specialist from SIA “Latvijas Vides, ģeoloģijas un meteoroloģijas centrs”, mechanical engineer from SIA “Caljan”, territory planner from the Liepaja City Construction Board, specialist from SIA “Latvijas mērnieks”.

It is expected that these changes positively impact the study quality. The two risks can be defined – the mechanism to ensure long term collaboration with temporary engaged staff is missing and accordingly the module content provided by temporary staff can be gone together with the leaving lecturer.

4.2. Liepaja University applies the following criteria for admission of the teaching staff - doctoral or master's degree in the field of a study course and / or work experience in the specific programme related field. Analysis of the Self-assessment documents and Annexes revealed that 25 members of the academic staff teach in the programme: 2 professors, 6 docents, 11 lecturers, 3 assistants, 3 guest lecturers. Of these, 14 are elected at the Liepaja University. 8 lecturers have a doctoral degree, while 5 are studying in a doctoral programme and plan to obtain a doctoral degree in the near future. All teaching staff involved in the study programme comply with the conditions of the study programme implementation and the requirements of the laws and regulations and enables of the achievement of the aims and learning outcomes of the programme and related study courses.

However, during the meeting with the programme management was pointed out that experts (industry professionals) are not interest to work at the university on a permanent basis due to heavy workload in their direct positions and comparatively low salaries of the academic staff, therefore, the number of involved teaching staff-practitioners is relatively small.

All lecturers involved in the implementation of the study programme are directly or indirectly related to any of the environmental sciences, engineering sciences or computer science and informatics (if the taught course is related to information technologies), except for the lecturers involved in teaching general education courses.

The study programme is going to be implemented in both Latvian and English. All participating teachers have an English language level of at least B2 according to self-assessment using the Common European Framework of Reference for Languages (CEFR). But as meeting with the academic staff revealed that there is need to improve the English language skills.

4.4. The analysis of self-assessment documents and interviews with the academic staff revealed that the link between research and study processes exists due to scientific activities of the staff in Liepaja University research institutes, i.e. the staff participates in national or international research

projects and have a possibility to develop actual topics for course works or final theses for the programme students, for example, the wave generator prototype developed as the bachelor's thesis by student was used in ISIT wave energy research, a result of the study project by another student - a submersible water flow generator created by using the findings of the research conducted by ISIT, was presented at the international exhibition of inventors and innovations "Minox 2020".

The research topics of the academic staff involved in the programme are in line with the study courses taught by them. This ensures that their research findings are integrated into study process. For example, the floating drone developed by DITI is used in the study courses "Electronics" and "Environmental Measurements and Sensors"; results of the research on Furcellaria algae in biogas production is used in study course "Biotechnology", etc. The research results published mainly in SCOPUS data base or other international or national reviewed scientific journals.

The discussion with the previous programme students revealed that educational/research software should be used more widely and official software licences should be obtained.

4.5. The teaching staff employed in the study programme cooperates both in the development and implementation of joint research and projects within the framework of the Liepaja University scientific institutes, as well as in the development of the content of joint study courses and exchange of information on current events in the field and study process. The exchange of information is ensured by regular meetings of lecturers in the meetings organized by the faculty and meetings within the framework of research activities in scientific institutes.

25 lecturers will be involved in the implementation of the study programme. The students are not yet enrolled in this programme, therefore it is impossible to assess the proportion of students and the teaching staff. Described by the previous EREME program where in the 2020/2021 academic year, it was 30 teachers per 18 students.

### **Conclusions by specifying the strengths and weaknesses**

Liepaja University has established sufficient scientific research culture and to a certain degree involved all counterparts in the research activities. Teaching staff and students participate in scientific projects and real time problems solution. However the clear motivation system to perform research activities is missing. The programme academic staff publications are mainly in SCOPUS data base or other international or national reviewed scientific journals. The permanent staff (elected positions) is more than 50 percent (including general courses), but there is a risk to ensure continuous quality of the programme course due possible personnel change in the main courses.

#### **Strengths:**

1. The programme staff performs research projects and integrates the results into the study process (actual topics for course work, final theses, new methodologies and results in the lectures);
2. The programme staff raise qualifications in exchange courses (ERASMUS) and qualification courses;
3. The high level foreign teachers were invited to teach in the previous programme (therefore it is supposed that this practice will be continued);
4. The students are involved in the research projects;
5. The experts - practitioners involved in the study process.

#### **Weaknesses**

1. More than 50 percent of the teaching staff (main subjects) is temporary engaged;
2. There is no motivation system to perform research activities.

## **5. Assessment of the Compliance of the Study Programme "Environmental innovation**

## technologies"

### Requirements

- 1 1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.  
**Assessment of compliance:** Fully compliant  
**Justification:** The sample of the diploma to be issued by Liepaja University for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued. (Annex IV.5.A)
- 2 2. Documents confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued.  
**Assessment of compliance:** Partially compliant  
**Justification:** The agreement on mutual commitment in ensuring the implementation of the study programme with the Latvia University of Life Sciences and Technologies (LLU) provides that students will be able to continue their studies in the LLU professional bachelor's study programme "Environment and Water Management". There is no clear convergence of study programs that are particularly important for students of recent courses. (Annex IV.5.B to Self-assessment report)
- 3 3. Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme.  
**Assessment of compliance:** Fully compliant  
**Justification:** There is document confirming that the Liepaja University guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the Liepaja University (actions or failure to act) and the student does not wish to continue the studies in another study programme. (Annex IV.5.C to Self-assessment report)
- 4 4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.  
**Assessment of compliance:** Fully compliant  
**Justification:** For teaching staff, Latvian is the mother tongue. Except for foreign guest teachers who perform training in English. (Annex II.7.A to Self-assessment report)
- 5 5. The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language.  
**Assessment of compliance:** Partially compliant  
**Justification:** The study programme is implemented in both Latvian and English. All participating teachers have an English language level of at least B2 according to self-assessment using the Common European Framework of Reference for Languages (CEFR). But as meeting with the academic staff revealed that there is need to improve the English language skills.
- 6 6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.  
**Assessment of compliance:** Not relevant

**Justification:**

- 7 7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Not relevant

**Justification:**

- 8 8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

**Justification:** The study contract conform to Cabinet Regulation No. 70 of 23 January 2007, to be included in the study contract. (Annex IV.5.E to Self-assessment report)

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

**Justification:** All the accompanying study course descriptions is in Latvian and English, according to the languages of their implementation. The information provided in the study course descriptions conforms to the requirements specified in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Higher Education, providing information regarding the requirements for the commencement of the course, the content of the course, the objectives and the intended study results, the work organisation plan, mandatory literature and evaluation criteria. Most sources of literature are over ten years old.

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Fully compliant

**Justification:** The study programme formally complies with the professional standard "Environmental engineer" (2143 01), approved at 06.07.2005, but there is a shortage of the scientific knowledge dimension. The professional standard is outdated. Work on updating the standard of occupation is ongoing.

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Not relevant

**Justification:**

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Fully compliant

**Justification:** The content of the study programme conforms to Cabinet Regulation No. 512 of 26.08.2014, Regulations regarding the State Standard for Vocational Higher Education, including the corresponding volume of general education and sectoral courses, the amount of practice and qualifications.

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

**Justification:**

14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

**Justification:** The SCOPUS database contained only 52% of the teaching staff involved in the implementation of the study programme. Eleven members of the academic staff do not have any publications published in reviewed editions within the last six years.

15 R5 - Overall rating

**Assessment of compliance:** Partially compliant

**Justification:** The study programme is based on an outdated professional standard that is dissociated with the innovation dimension defined in the title of the study programme. The low scientific activity of academic staff raises legitimate concerns about the introduction of an innovation dimension, which is closely linked to the risks of implementing the study programme and the competitiveness of graduates in the labour market.

## Requirements (R6-R8)

1 R6 - The compliance of the study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of the learning outcomes.

**Assessment of compliance:** Partially compliant

**Justification:** The study base ensure the implementation of the programme, the technical engineering base is sufficient, the availability of information resources is sufficient. Potential challenges for providing a material-technical base in the long term, provided that the minimum number of students in groups is not provided and funding from other university financial resources is not available.

2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

**Assessment of compliance:** Partially compliant

**Justification:** The implementation of the study programme involves qualified Liepaja university teaching staff, but requires the systematic growth of academic staff. Paying particular attention to scientific activities and the publication of research results in indexed databases.

3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

**Assessment of compliance:** Not relevant

**Justification:**

## Conclusions by specifying the strengths and weaknesses

The study programme is in line with the strategic objectives of the University of Liepaja and is based on trends in the EU and the global environmental sector. The content of the study programme is developed in the management of teaching staff, taking into account industry trends, including students' views on the organisation of the study process. The study programme does not include, or only partly, the acquisition of technical knowledge relevant to the specific characteristics of the sector.

The programme formally complies with the national professional standard of environmental

engineering. The study programme is quite different from most other environmental engineering programmes in Latvia and abroad. It may also affect the employment of graduates in a given area of environmental engineering.

The material and technical basis, laboratory equipment and equipment available for the initial implementation of the programme shall be suitable for the specificity and implementation of the study programme. In the meantime, there is no clarity on the long-term feasibility of providing a technical base. The information and methodology base shall be sufficient to ensure that the study programme is carried out. The literature available in the library provides basic needs of the study programme, but regular updating of the current literature needs to be carried out.

There is a lack of a clear motivation system for carrying out research activities. Academic staff have an insufficient number of publications in the SCOPUS database. Permanent staff is less than 50 per cent, so there is a risk of continued quality of the course of the programme, as a change in staff is possible.

#### Strengths:

1. The study programme has broad opportunities for developing growth and competitiveness through cooperation with other educational institutions, both nationally and internationally.
2. The education acquired in the study programme is comparable to that obtained in other countries of the European Union, thus allowing extensive mobility of students and teaching staff.
3. The parties involved in the development of the study programme (employers, teaching staff) positively assess the importance of involvement and the willingness of the university to implement the supplements and proposals to the study programme, but they are not sufficiently familiar with the actual content of the training programme developed.
4. A multidisciplinary approach provides a wide view of the items revolving around environmental sciences and technology to students.
5. The teaching methods employed allow for the better development of certain valuable skills (e.g. communication skills) among students.
6. Student mobility is encouraged and supported.

#### Weaknesses

1. International and national cooperation with other educational institutions has not paid sufficient attention to ensure the sustainability and development of the programme;
2. A very narrow educational niche for environmental sciences has been identified for the implementation of the study programme, which can threaten the implementation and development of the study programme in the long term.
3. Graduates of this programme could be at a comparative disadvantage in an international job market that pertains to environmental engineering, due to a more loose coverage of technical skills that engineers should possess. Elements that are considered key to engineering education are only superficially covered.
4. Laboratory works of courses could be reinforced, and should be coupled with an upgrade of the pertinent facilities to cater to these needs.
5. The intense use of guest instructors poses the question of course "ownership" and quality. If this practice is to be maintained, a controlling mechanism must also be put in place to avoid the aforementioned negative connotations.
6. The acquisition of software and the modernization of available software, and their formal usage in courses, could benefit students in developing market-oriented skills.
7. Course contents are sometimes "spread thin", meaning that they incorporate a large number of topics that are introduced to students in a very limited amount of time.

8. Courses often have little connection to one another (especially with regards to prerequisites), which hampers the programme flow, despite the fact that it allows certain flexibility in the offerings of courses.
9. The literature in the English-language that is used in courses should be reinforced.
10. There is no clear approach and resources to maintain and update the material-technical base in the long term, which is essential for the acquisition of innovative knowledge.
11. There is no considerable opportunity to promote regional cooperation with companies in the provision of a technical and technical base and the use of equipment at the disposal of companies to ensure the training process.
12. There is no clearly marked system of motivation for the scientific activities of teaching staff.
13. More than 50 percent of the teaching staff is temporary engaged;
14. There is no motivation system to perform research activities.

### **Evaluation of the study programme "Environmental innovation technologies"**

Evaluation of the study programme:

Average

### **6. Recommendations for the Study Programme "Environmental innovation technologies"**

#### **Short-term recommendations**

It is necessary to attract full-time academic staff able to engage in scientific research, which is one of the prerequisites for innovation.

Parts of the course laboratory works should be reinforced and combined with the upgrading of the equipment concerned in order to meet these needs.

The course descriptions should be reviewed to reflect the true content of the courses.

The content of the courses should be reviewed and consolidated in order to achieve the acquisition of structured knowledge and to avoid fragmentation.

The continuity of study courses must be ensured by encouraging the flow of programmes, despite the fact that they allow some flexibility in the offers of courses.

The literature used in courses should avoid means in Latvian and move to English teaching literature.

#### **Long-term recommendations**

Approaches and resources should be developed to maintain and update the material-technical base in the long term, which is essential for the acquisition of innovative knowledge.

A network should be established to promote regional cooperation with companies in the provision of a technical and technical base and in the use of equipment at the disposal of companies to ensure the training process.

Analyse opportunities for promoting the competitiveness of graduates in the labour market by increasing theoretical and practical engineering training.

It is necessary to develop engineered or technology-oriented identities.

The purchase of software and the modernisation of available software and their formal use in courses could benefit students in the development of market-oriented skills.

## II. "Ecotechnologies" ASSESSMENT

### II. "Ecotechnologies" ASSESSMENT

#### 1. Indicators Describing the Study Programme

##### Analysis

The establishment of the "Ecotechnologies" professional master's study programme (hereinafter - study programme) is in line with the objectives set out in the Liepaja University strategy for 2014-2020 and is considered to be an element in achieving these objectives. During the evaluation of the study programme, the strategy expired, but information from the management of the Liepaja University was received that the strategy was extended and approved until 2023. The course of the approval of the strategy is closely linked to the development of documents at national level and in coordination with the Ministry of Education and Science.

The study programme will help to achieve the mission set out in the Liepaja and Kurzeme region Strategy, "To be a facilitator of education, science, innovation and cultural development in Liepāja and Kurzeme, which provides competitive, regional development-required, governmental and internationally important studies, implements research-related, governmental and internationally-recognised research and contributes to the sustainable development of society." During the expert visit, students were found to be taking advantage of the opportunities offered by the study programme.

The implementation of the study programme in English corresponds to the objective set out in the Liepaja University strategy and harmonises with the guidelines of the Latvian National Development Plan 2021-2027, which focuses on the knowledge society, the klimat-neutrality "Green Course" and the circular economy. The English study programme will not only ensure the attraction of foreign students, but will open up the possibility of attracting foreign guest lecturers who will contribute to the quality of the study programme, in the field of ecotechnologies.

Similarly, the study programme will enable Liepaja University to reach the ultimate goal of "Providing research-based, regional, competitive and high-quality opportunities for higher vocational, academic education and lifelong learning, promoting the development of an economy based on knowledge and professional competence and the strengthening of a creative, cultural society." The purpose of the study programme is to prepare competitive specialists in the field of environmental technologies, who:

- (a) focus on current ecotechnologies and understanding of environmental problems; and
- (b) are able to apply them to specific situations in companies and institutions in order to mitigate environmental impacts and save resources; and
- (c) are capable of producing the corresponding ecotechnologies. The results of studies planned by the study programme are in line with its objectives and objectives, as well as the planned results of study courses dedicated to the training of highly qualified and competent specialists with a broad understanding of the sector's issues and the ability to work for its development, creating ecotechnology solutions with real added value and managing the implementation of such solutions in life. The objectives of the study programme are directly subordinated to the purpose of the study programme and are logically linked to the expected results of the study, where the integration of rolling skills into the objectives of the study programme and the expected results of the studies should be marked as a positive moment.

The name of the study programme, the aims, objectives, learning outcomes, and admission

requirements are interrelated.

## **Conclusions by specifying the strengths and weaknesses**

The study courses of the programme are linked to global climate policy and sustainable development objectives. Specialists in the field of environmental technologies have been requested in the public and private sectors. The programme's objectives and learning outcomes are publicly available and stakeholders interviewed were informed of the identified tasks. The objectives of the programme are based on the continued lack of specialists able to develop environmentally friendly ecotechnology solutions with skills in ecology and environmental management that are able to meet the preconditions of global environmental policy. The content of the programme's learning outcomes largely proves that graduates will get the skills needed to be professionals with a broad understanding of environmental issues. The implementation of learning outcomes supports practical training – traineeships in businesses, public bodies, institutes. The results of training are generally sufficiently reflected and interlinked with the content of the programme and the level of subjects.

Strengths:

1. Multidisciplinarity of study program and added value for professionals of different fields;
2. International student proportions highlight actuality and sustainability of this study programme.

## **2. The Content of Studies and Implementation Thereof**

### **Analysis**

#### 2.1

The University provided detailed information on the Ecotechnologies Programme of Study (PoS) that leads to the Professional Master's Degree in Environmental Science and Environmental Management, including a semester-by-semester break-down of courses, an indication of the category of each course (e.g. compulsory versus electives) and an outline of each course.

The course outlines submitted in the self-assessment package conform to a uniform standard. Bloom's taxonomy was employed in the elaboration of learning objectives in course outlines. However, some course outlines lack in content (e.g. provide the majority of their literature sources in Latvian, as opposed to English). Examples of such courses are the following: "Environmental project development and management", and "Environmental science and management",

The 3-semester Programme of Study (PoS) that leads to the professional MSc Degree in EcoTechnologies consists of 62 Credit Points (CPs), where each CP corresponds to 1.5 European Transfer Credit System (ECTS), and it fully conforms to the State Education Standard, as this was explicitly indicated in the Self-Assessment report. Nine CPs correspond to an Internship component, while the Master Thesis is allocated 20 CPs. The last semester of studies is dedicated to the Master Thesis. The topics of students' theses correspond to the basic principles of sustainable development and circular economy.

The PoS provides a broad coverage of topics, including environmental psychology, overview of environmental technologies, and research methodologies. The Programme has been developed in accordance with the Law on Education, the Law on Higher Education Institutions of the Republic of Latvia, the Regulations Regarding Licensing of Study Programmes, the Constitution of the Liepaja University (Liepaja University) and the requirements of other laws and regulations.

As it stated in the self-assessment report provided by the University, "the study programme and its content are designed to provide competitive education in the conditions of a changing labour market - it includes the competencies necessary for environmental technology, environmental management and circular economy tasks, thus opening wide career opportunities in various types of companies and institutions. In addition, the study content also provides the knowledge and skills necessary for

starting a business, as well as develops non-standard problem-solving competencies, looking at such innovative areas as ecotechnology, biomimicry and biotechnology.”

The PoS follows a broad approach and it caters primarily to a more mature audience, who are already employed in the field, and who want to enhance their skills and competences by adding a general understanding of ecotechnologies and other pertinent theories in their toolkit. Interviews with graduates of this programme of study (during the committee’s site-visit) further reinforces the aforementioned postulate. Essentially, graduates characterized this PoS as a “life sciences programme”, taking a “multidisciplinary approach”, that gives a “broad perspective”, and “integrating various fields with environmental ideas”.

The broad approach of the PoS can also justify the varied academic backgrounds of students it attracts. Had this programme had any one specific direction, or had it placed more intensity on a specific area, then a student that comes from a different academic background would have had more difficulty following certain courses.

No official data on the subsequent career of programme graduates was provided by the university. Instead, a reference to a National data collection system and a claim for the non-responsiveness of graduates were made.

## 2.2

The study implementation methods (including evaluation methods) contribute to the achievement of the aims and learning outcomes of the study courses, as these are listed in the course outlines.

Courses are taught through a variety of approaches, including lectures, seminars and workshops. Diverse methods of communication are used. Students feel their interactions with their professors to be frequent and positive, forming the sense of a close-knit community. All of the aforementioned ensure a more student-centered learning approach.

The courses offered employ a multitude of teaching methods, yet emphasis is placed on project work. This project-based approach is also reflected in the course evaluation methods.

Several of the faculty members offering courses in the PoS are external collaborators who contribute interesting discussions to class, yet some were characterized as being sporadically unprepared for lecture.

The use of technology (especially Moodle) in the teaching of courses is limited. This would also help improve the ad-hoc approach that is taken when it comes to students who follow the English-speaking programme of study. Currently, as it was let understood by the university’s faculty and administration, non-Latvian-speaking students are catered to on a more individual basis. This model of operation cannot be maintained with larger audiences.

Discussions with program students and graduates created the impression that they are not steeped in research during their studies, with the exception of their Master’s Thesis work. There is widespread a misconception that research means “literature review”. At the same time, students and graduates said that the programme helped them acquire a specific “mindset” that is helpful to them with regards to broader environmental issues.

Laboratories have not been included in any meaningful manner within this PoS (as reflected by the course outlines provided).

## 2.3

The university conducts three types of surveys: 1) among students, 2) among graduates of the program of study, and 3) among employers.

1. Students Surveys: according to the self-assessment report, surveys of students were conducted at the end of each study year, covering students of all courses. During the site-visit, it was stated that student surveys are not conducted for all courses every year, but instead there is a selection of courses. A rudimentary summary of the results of these surveys were provided to the committee upon request, yet the information was in Latvian, hence it could not be scrutinized.

2. Graduates surveys: it seems that there is no formalized means of surveying graduates. Low response rates are also reported for during times when such surveys were conducted.

3. Employers surveys: no specific reference to employer surveys was made in the self-evaluation report; however, one would assume that the approach taken in the BSc programme of study (i.e. regularly interviewing student's internship supervisors) would be adopted here as well.

Based on specific information presented in the self-assessment report, the university seems to have made specific use of information received from the aforementioned surveys for the improvement of the programme of study.

#### 2.4

The students avail themselves of the incoming and outgoing mobility opportunities, and the learning outcomes achieved during such mobility are recognized. The university has a good support system for Erasmus+ students. This was described in the self-assessment report, it was clarified through written responses to questions asked by the committee and was emphasized by students during the site-visit and the meeting with students. The university has procedures in place, which are followed for students to take courses that count towards their programme of study. Several students have taken this opportunity and have commented positively on the whole experience.

### **Conclusions by specifying the strengths and weaknesses**

Liepaja University has created a programme of study (PoS) that leads to a Professional Master's Degree in Environmental Science and Environmental Management that provides a wide range of elements in the field of environmental protection. The programme is supported in a manner that is conducive to student-centered learning, and it employs a multitude of teaching methods and student evaluation methods. The programme caters mostly to professionals who want to reinforce their knowledge base on issues that revolve around environmental studies.

#### Strengths:

The strengths of the Programme of Study leading to the MSc degree in EcoTechnologies are the following:

A multidisciplinary approach provides students a wide view of the items revolving around environmental sciences.

The teaching methods employed allow for the better development of certain valuable skills (e.g. communication skills) among students.

The implementation of the PoS creates an environment conducive to learning, especially through the creation of a sense of a close-knit community.

Student mobility is encouraged and supported.

The opinions of students and employers have been considered in the further development of the PoS.

#### Weaknesses

The following items could be considered as suggestions for further improvement of the Programme of Study leading to the MSc degree in EcoTechnologies:

Limited availability of modern software necessary for the teaching of courses and developing market-oriented skills among students.

Much of the literature resources used in courses is in the Latvian language.

The ad-hoc treatment of non-Latvian-speaking students (with regards to such things as literature sources) sets a poor operational standard.

Technology skills of instructors (especially with the use of Moodle) are under par.

Surveys of student/graduates/employers are not formal (i.e. they do not use specific tools/questionnaires and a formal exit interview) nor systematic in their administration.

### **3. Resources and Provision of the Study Programme**

#### **Analysis**

The necessary material and technical provision and staff have been identified for the implementation of the study programme, but on the basis of the information received during the meeting with Liepaja University representatives and teaching staff, it is limited to the possibility of participation in scientific research and to acquire international experience which is very relevant for the implementation of the developed study programme, particularly in view of its pursuit of innovation creation and implementation. As well as the implementation of the study programme, international and national mobility is essential, ensuring continued capacity building for teaching staff and their compliance with labour market requirements, but this dimension is not addressed in the study programme's description. Several Liepaja University departments are involved in the implementation of the study programme. The study programme is supervised and overseen by the Nature and Engineering Faculty. The study process is provided in cooperation with the Faculty of Pedagogy and Social Work, the Faculty of Humanities and Arts Sciences, the Faculty of Management and Social Sciences and the Institute of Natural Sciences and Innovative Technologies. During the expert visit, it was found that the department responsible for providing the teaching of a given study course was responsible for the content of the study course and for its realisation. It was also found that support staff in training laboratories providing support during laboratory work was provided, but the involvement of students in scientific activities at the Institute of Natural Sciences and Innovative Technologies is a case-by-case nature where the student should show interest and agree with the management of the Institute on the use of equipment during development of Master thesis.

Also as several Liepaja University departments are involved in the implementation of the study programme, there is a regular use of the same equipment that has been of use for other departments which does not provide any in depth practical applications for the specificity of the study programme. Those laboratories that are meant for a more specific application are very simple and are not necessarily suitable for a masters programme.

An analysis of the available information and speaking to Liepaja University representatives during the expert visit showed that a high level of digitisation is ensured in the course of the study programme, by integrating information technology (IT) solutions into the study and scientific work processes, providing students, administrative and academic staff with modern, unified IT infrastructure and high-quality IT services. A centralised study management system is used to effectively administer the study process. The literature available in the Scientific Library, the available databases shall comply with the conditions for the implementation of the study programme. Students have access to an informative and methodical base. You can use interlibrary subscription services. The following scientific databases are subscribed to:

- EBSCO;
- ScienceDirect;
- Cambridge Journals Online;
- Scopus;
- Letonica.

The Small Scientific Library shall offer the premises to its visitors, providing technical support to students in the search for the necessary information. Analysis of available literature sources at the library, which took advantage of the possibilities offered by Liepaja University's electronic catalog, concluded that the available literature sources provide basic needs for the study programme, but it was necessary to regularly restore the library's stocks with the latest costs. The required range of scientific literature shall be provided by the abovementioned databases.

#### **Conclusions by specifying the strengths and weaknesses**

Liepaja University has a system that mostly is reliant on state funding and doesn't have a strong system to determine financial resources required for successful implementation of the study programme "Ecotechnologies" and no clearly defined system for financing of the research of academic staff outside the state funding and projects. The infrastructure provided by Liepaja University is sufficient for the needs of the study field, but it does not have the necessary software for the study process, such as GIS software and laboratories do not provide in depth practical work for the study programme. Liepaja University provides basic resources for work, studies, and research: the study rooms are well-equipped, study books are available for study fields and generally for all the specific courses. Liepaja University has developed procedures to attract skilled teaching staff, but the recruitment process is less than formal. There is a serious lack of competitions for the academic positions and most of the academic personnel are not elected. Staff members go through self-evaluation taking into consideration feedback of the students, but it could benefit from further encouragement of the staff to keep up with modern teaching methodology, pedagogical skill set and keep up with the latest developments in education, especially in areas such as student-centred learning and problem-based learning. Liepaja University has an admirable student support system that focuses on student needs ensuring the necessary assistance. The students and graduates also acknowledged the accessibility and openness of the administration.

#### Strengths:

- 1) Well-equipped library and broad choice and granted access to scientific and professional databases.
- 2) Great use of guest lecturers. Graduates and employers are asked to partake in lectures and teach.
- 3) There is a student-oriented support system, following the needs of students at any specific step of their studies and career development. The academic staff is very helpful and responsive.
- 4) The small student groups allow for regular assessment of students' progress and special support to students who have difficulties with studies.
- 5) There is a lot of mobility for students in the study field both in Latvia and abroad.

#### Weaknesses

- 1) The university cannot ensure the regrowth of academic personnel because it doesn't have a PhD program. Academic staff and Alumni are very inactive in obtaining of PhD degrees, that hinders number of the planned teaching staff at Liepaja University;
  - 2) Most faculty members lack application of MOODLE in daily work. The information is scattered and poorly managed making it a difficult work organization.
  - 3) The software programs are mainly open source, there is a lack of work with software that is currently being used in the work field and is applicable in the modern work environment.
  - 4) Many courses are reliant on specific lecturers that if they left, the course would be shut down
  - 5) There is a lack of elected academic personal to ensure long term development of the study programs
  - 6) The laboratory resources are simple and very specific and do not allow for the development of a wide range of skilled specialists.
  - 7) Science development is mostly reliant on government and project funds, there is little support from university funds.
- 1) The laboratory resources are simple and very specific and do not allow for the development of a wide range of skilled specialists

## 4. Teaching Staff

## Analysis

4.1 During the reporting period the study programme “Ecotechnologies” was continuously renewed. According to the strategy Liepaja University composes the academic staff accordingly to the main competences, which the programme should ensure. It means that programme modules composition should ensure adequate qualification for graduates. Therefore the composition of the lecturers has been changed in accordance with the specifics of the new programme.

Also the ERASMUS+ mobility programme was actively used to invite highly rated professionals from national and international institutions. The programme students attended the lectures of the foreign guest lecturers on circular economy, ecodesign, green energy and other topics, which were involved in the various national and international research projects .

Involvement of international teaching staff is an added value to the quality studies and provided opportunities to get international experience and laboratory work opportunities for local programme staff at Klaipeda University. Consequentially the teaching materials and personal competences of the staff are continuously renewed and quality of the study ensured.

4.2. Liepaja University applies the following criteria for admission of the teaching staff - doctoral or master's degree in the field of a study course and / or work experience in the specific programme related field.

Analysis of the Self-assessment documents and Annexes revealed that 9 members of the academic staff teach in the programme: 2 professors (1 guest professor), 5 docents, 1 lecturer, 1 assistant. Only 44 percent of the staff are elected. In addition, the teachers- practitioners from the companies, such as SIA Balticflok, SIA Skara, the Green and Smart Technologies Cluster, the Latvian Rural Advisory and Training Centre and others, are invited to deliver lectures or workshops. The involvement of teaching staff-practitioners helps students to ensure a better understanding of the interrelationships between theory and practice. The professionals are employed on temporary basis due to the small amount of the teaching hours. Also they are involved in the internship process and in the final examination commission.

All teaching staff involved in the study programme comply with the conditions of the study programme implementation and the requirements of the laws and regulations and enables of the achievement of the aims and learning outcomes of the programme and related study courses.

However, during the meeting with the programme management was pointed out that experts (industry professionals) are not interested to work at the university on a permanent basis due to heavy workload in their direct positions and comparatively low salaries of the academic staff, therefore, the number of involved teaching staff-practitioners is relatively small. Therefore it is highly recommended to establish the clear motivation system to perform research activities, including special rating for a higher quality scientific publications (for example, with IF in Clarivate analytics data basis).

All participating teachers have an English language level of at least B2 according to self-assessment using the Common European Framework of Reference for Languages (CEFR). But as meeting with the academic staff revealed that there is need to improve the English language skills.

4.4. The analysis of self-assessment documents and interviews with the academic staff revealed that the link between research and study processes exists due to scientific activities of the staff in Liepaja University research institutes, i.e. the staff participates in national or international research projects, development of scientific publications and have a possibility to develop actual topics for course works or final theses for the programme students. Very close collaboration with researches from Klaipeda university (Lithuania) is identified (scientific publications and projects).

Another important achievement is involvement of the students in NORDPLUS Higer Education projects related to circular economy and eco-design.

The research topics of the academic staff involved in the programme are in line with the study

courses taught by them. This ensures that their research findings are integrated into study process. The discussion with the previous programme students revealed that educational/research software should be used more widely and official software licences should be obtained.

4.5. The teaching staff employed in the study programme cooperates both in the development and implementation of joint research and projects within the framework of the Liepaja University scientific institutes, as well as in the development of the content of joint study courses and exchange of information on current events in the field and study process. The exchange of information is ensured by regular meetings of lecturers in the meetings organized by the faculty and meetings within the framework of research activities in scientific institutes, for example, in five NORDPLUS Higher Education projects in 2017 - 2020), as well as in the development of joint study course content and exchange of information on current events in the field - by meeting at various exhibitions in the scope of the sector (School, Business Days in Kurzeme, etc.), events, international conferences, seminars, and other networking events.

9 lecturers are teaching per 21 modules are involved in the implementation of the study programme. It indicates that some of the lecturers taught very intensively (for example, Master's study programme director - 8 courses, head of the study field - 5 courses). Bearing in mind that only 9 lecturers participate in the teaching process and only 4 of them are in permanent basis, the risk for study quality can be identified.

### **Conclusions by specifying the strengths and weaknesses**

Liepaja University established sufficient scientific research culture and to a certain degree involved all counterparts in the research activities. Teaching staff and students participate in scientific projects and real time problems solution. However the clear motivation system to perform research activities is missing. The programme academic staff publications are mainly in SCOPUS data base or other international or national reviewed scientific journals. The permanent staff (elected positions) is only 44 percent, therefore there is a risk to ensure continuous quality of the programme course due possible personnel change.

Strengths:

1. The programme staff performs research projects and integrates the results into the study process (actual topics for course work, final theses, new methodologies and results in the lectures);
2. The programme staff raise qualifications in exchange courses (ERASMUS) and qualification courses;
3. The high level foreign teachers were invited to teach in the programme;
4. The students are involved in the research projects;
5. The experts - practitioners involved in the study process.

Weaknesses

1. More than 50 percent of the teaching staff is temporary engaged;
2. There is no motivation system to perform research activities.

## **5. Assessment of the Compliance of the Study Programme "Ecotechnologies"**

### **Requirements**

1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.

**Assessment of compliance:** Fully compliant

**Justification:** The sample of the diploma to be issued by Liepaja University for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued. (Annex III.5.A to Self-assessment report)

2. Documents confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued.

**Assessment of compliance:** Fully compliant

**Justification:** The agreement on mutual commitment in ensuring the implementation of the study programme with the Latvia University of Life Sciences and Technologies (LLU) provides that students will be able to continue their studies in the LLU academic Master's study program "Environmental Engineering Science" (Annex III.5.B to Self-assessment report)

3. Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme.

**Assessment of compliance:** Fully compliant

**Justification:** There is document confirming that the Liepaja University guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the Liepaja University (actions or failure to act) and the student does not wish to continue the studies in another study programme. (Annex III.5.C to Self-assessment report)

4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.

**Assessment of compliance:** Fully compliant

**Justification:** For teaching staff, Latvian is the mother tongue. Except for foreign guest teachers who perform training in English. (Annex II.7.A to Self-assessment report)

5. The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language.

**Assessment of compliance:** Partially compliant

**Justification:** The study programme is implemented in both Latvian and English. All participating teachers have an English language level of at least B2 according to self-assessment using the Common European Framework of Reference for Languages (CEFR). But as meeting with the academic staff revealed that there is need to improve the English language skills.

6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.

**Assessment of compliance:** Not relevant

**Justification:**

7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Not relevant

**Justification:**

8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

**Justification:** The study contract model conforms to Cabinet Regulation No. 70 of 23 January 2007, to be included in the study contract. (Annex III.5.E to Self-assessment report)

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

**Justification:** All the accompanying study course descriptions shall be in Latvian and English, according to the languages of their implementation. The information provided in the study course descriptions mainly conforms to the requirements specified in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Higher Education, providing information regarding the requirements for the commencement of the course, the content of the course, the objectives and the intended study results, the work organisation plan, mandatory literature and evaluation criteria. Not for all study courses, basic literature is in Latvian and English

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Not relevant

**Justification:**

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Not relevant

**Justification:**

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Fully compliant

**Justification:** The content of the study programme conforms to Cabinet Regulation No. 512 of 26.08.2014, Regulations regarding the State Standard for Professional Higher Education, including the corresponding volume of general education and sectoral courses, the amount of practice and qualifications.

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

**Justification:**

- 14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

**Justification:** The SCOPUS database contained only 52% of the teaching staff involved in the implementation of the study programme. Eleven members of the academic staff do not have any publications published in reviewed editions within the last six years. (according to information provided in Annex II.7.A to Self-assessment report)

- 15 R5 - Overall rating

**Assessment of compliance:** Partially compliant

**Justification:** For academic staff, English knowledge is at a satisfactory level. The descriptions of studio purses formally meet the requirements but are fragmented and should include the latest literature. Academic staff have low levels of scientific activity.

### Requirements (R6-R8)

- 1 R6 - The compliance of the study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of the learning outcomes.

**Assessment of compliance:** Partially compliant

**Justification:** The study base do not ensure the implementation of the programme, the technical engineering base is sufficient, the availability of information resources is sufficient. Potential risk for providing a material-technical base in the long term, provided that the minimum number of students in groups is not provided and funding from other university financial resources is not available.

- 2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

**Assessment of compliance:** Partially compliant

**Justification:** The implementation of the study programme involves qualified Liepaja university teaching staff, but requires the systematic growth of academic staff. Paying particular attention to scientific activities and the publication of research results in indexed databases.

- 3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

**Assessment of compliance:** Partially compliant

**Justification:** Liepaja University established sufficient scientific research culture and to a certain degree involved all counterparts in the research activities. Teaching staff and students participate in scientific projects and real time problems solution. The clear motivation system to perform research activities is missing.

### Conclusions by specifying the strengths and weaknesses

The content of the study programme is linked to the objectives of global climate policy and sustainable development. The objectives of the programme are based on the continued lack of specialists able to develop environmentally friendly eco-technology solutions with skills in ecology and environmental management that are able to meet the preconditions of global environmental policy. The content of the program's learning outcomes largely proves that graduates will get the skills needed to be professionals with a broad understanding of environmental issues. The results of training are generally sufficiently reflected and interlinked with the content of the programme and the level of subjects. The programme focuses mainly on professionals who want to strengthen their knowledge base on environmental research.

The LiepU provides basic resources for work, studies and research: study rooms are equipped, study books are available for study fields and, in general, for all specific courses. The bulk has developed procedures to attract qualified teaching staff, but the recruitment process is formal. Most academic staff are not elected. LiepU has established a sufficient scientific research culture and, to some extent, involved all research partners. Teachers and students participate in scientific projects and real-time challenges. However, there is a lack of a clear motivation system for carrying out research

activities. The publications of the academic staff of the programme are mainly in the SCOPUS database or in other international or state-reviewed scientific journals. Permanent staff (elected posts) is only 44 per cent, so there is a risk of continued quality of the course of the programme due to possible changes in staff.

#### Strengths:

1. International student proportions highlight actuality and sustainability of this study program.
2. A multidisciplinary approach provides students a wide view of the items revolving around environmental sciences.
3. The implementation of the study program creates an environment conducive to learning, especially through the creation of a sense of a close-knit community.
4. Well-equipped library and broad choice and granted access to scientific and professional databases.
5. Great use of guest lecturers. Graduates and employers are asked to partake in lectures and teach.
6. There is a student-oriented support system, following the needs of students at any specific step of their studies and career development. The academic staff is very helpful and responsive.
7. The small student groups allow for regular assessment of students' progress and special support to students who have difficulties with studies.
8. There is a lot of mobility for students in the study field both in Latvia and abroad.
9. The high level foreign teachers were invited to teach in the programme;
10. The students are involved in the research projects;

#### Weaknesses

1. The literature used in courses should avoid resources in the Latvian language, and an ad-hoc treatment of non-Latvian-speaking students should be avoided.
2. The university cannot ensure the regrowth of academic personnel because it doesn't have a PhD program. Academic staff and Alumni are very inactive in obtaining of PhD degrees, that hinders number of the planned teaching staff at Liepaja University;
3. Most faculty members lack application of MOODLE in daily work. The information is scattered and poorly managed making it a difficult work organization.
4. The software programs are mainly open source, there is a lack of work with software that is currently being used in the work field and is applicable in the modern work environment.
5. There is a lack of elected academic personal to ensure long term development of the study programs. More than 50 percent of the teaching staff is temporary engaged.
6. The laboratory resources are simple and very specific and do not allow for the development of a wide range of skilled specialists.
7. Science development is mostly reliant on government and project funds, there is little support from university funds.
8. There is no motivation system to perform research activities.

### **Evaluation of the study programme "Ecotechnologies"**

Evaluation of the study programme:

Good

## 6. Recommendations for the Study Programme "Ecotechnologies"

### Short-term recommendations

Parts of the course laboratory works need to be reinforced and should be combined with the upgrading of the equipment concerned in order to meet these needs.

The classroom must bring field research experience, especially from elected faculty members;

The course descriptions should be reviewed to reflect the true content of the courses.

The content of the course should be reviewed and consolidated in order to achieve the acquisition of structured knowledge and to avoid fragmentation.

The continuity of study courses must be ensured by encouraging the flow of programmes, despite the fact that they allow some flexibility in the offers of courses.

For English study groups the literature used in courses should avoid literature sources in Latvian and move to English teaching literature.

### Long-term recommendations

The elements that are considered to be key to engineering education should be developed, thereby contributing to the competitiveness of graduates in the labour market.

The issue of "ownership" and quality of study courses needs to be resolved. In order to maintain this practice, it is also necessary to introduce a control mechanism in order to avoid the negative effects mentioned above.

Purchasing software and upgrading available software to provide students with market-oriented skills.

The mechanism for using student/graduates/employers feedback should be more efficient and effective.

Additional approaches and resources are needed to maintain and update the material-technical base in the long term, which is essential for the acquisition of innovative knowledge.

Regional cooperation with companies should be developed in the provision of a technical and technical basis and in the use of equipment at the disposal of companies to ensure the training process.

The scientific activities of teaching staff should develop and implement a clearly defined motivation system.

The attraction of full-time academic staff to study programmes motivated by scientific research and their integration into the study process should be promoted.

## III. Assessment of the Requirements for the Study Field and the Relevant Study Programmes

### III. Assessment of the Requirements for the Study Field and the Relevant Study Programmes

#### Assessment of the Requirements for the Study Field

Requirements	Requirement Evaluation	Comment
R1 - Pursuant to Section 5, Paragraph 21 of the Law on Institutions of Higher Education, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their internal quality assurance systems:	Partially compliant	The LiepU supports internal quality assurance system oriented on continuous improvement, development and performance of the study field "Environmental protection". The quality system formally is applied, but it lacks important elements such as scientific activity, that are critical for higher education.
R2 - The cooperation with different organisations from Latvia and abroad implemented within the study direction ensures the achievement of the aims of the study direction.	Partially compliant	The Liepaja University has managed to position itself centrally in the general field of Environmental Protection of Liepaja City. They have set up a network of collaborative centres through which they have managed to implement a successful traineeship programme in their study programme. There is a lack of an international perspective on the areas of study to be assessed.
R3 - Compliance of scientific research and artistic creation with the development level thereof (if applicable).	Partially compliant	The experts found that research activities of Liepaja University are carried out at a satisfactory level. However, the Liepaja University should develop an effective continuous mechanism for more active involvement of teaching staff in high-level research activities leading to higher-level publications and better Liepaja university prestige.
R4 - Elimination of the shortcomings and deficiencies identified during the previous assessment of the study direction, if it has been conducted, or the implementation of the provided recommendations.	Partially compliant	The recommendations provided during the previous procedures for the assessment of the study field have been partially implemented. The Liepaja University has contributed to the analysis of the recommendations and their implementation in view of the specific features of the study field and the relevant study programmes. There is evidences of implementation, but still there is need for further improvement.

### Assessment of the Requirements for the Relevant Study Programmes of the Study Field

<b>No.</b>	<b>Study programme</b>	<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>	<b>Evaluation of the study programme (excellent, good, average, poor)</b>
1	Environmental innovation technologies (42529)	Partially compliant	Partially compliant	Partially compliant	Not relevant	Average
2	Ecotechnologies (47851)	Partially compliant	Partially compliant	Partially compliant	Partially compliant	Good

### **The Dissenting Opinions of the Experts**

There are no the dissenting opinions of the experts