



**REPORT
OF THE EXPERT PANEL
ON THE
RE-ACCREDITATION OF THE
Department of Biology of Josip Juraj Strossmayer University
of Osijek,**

**Date of preliminary site visit:
25 March 2021**

**Date of on-line re-accreditation:
15-16 April 2021**

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INTRODUCTION

The Agency for Science and Higher Education (the Agency) is an independent legal entity with public authority, registered in the court register, and a full member of the European Quality Assurance Register for Higher Education (EQAR) and European Association for Quality Assurance in Higher Education (ENQA).

All public and private higher education institutions are subject to re-accreditation, which is conducted in five-year cycles by the Agency, in accordance with the *Act on Quality Assurance in Science and Higher Education* (Official Gazette 45/09) and subordinate regulations, and by following *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) and good international practice in quality assurance of higher education and science.

The Agency's Accreditation Council appointed an independent Expert Panel for the evaluation of the Department of Biology of Josip Juraj Strossmayer University of Osijek.

Members of the Expert Panel:

1. Prof. dr. sc. Mladen Krajačić, Faculty of Science, University of Zagreb, Republic of Croatia - **Chair of the Expert Panel**,
2. Assoc. prof. Božo Frajman, PhD, Institut für Botanik, Universität Innsbruck, Republic of Austria,
3. Assoc. prof. Jana Ambrožič-Dolinšek, PhD, Fakulteta za naravoslovje in matematiko, Univerza v Mariboru, Republic of Slovenia,
4. Prof. dr. sc. Jasna Puizina, Faculty of Science, University of Split, Republic of Croatia,
5. Magdalena Matić, Faculty of Science, University of Zagreb, Republic of Croatia.

During the site visit, the Expert Panel held meetings with the following stakeholders:

- Management,
- Deputy Head for Education and Students,
- Deputy Head for Research,
- Students,
- ECTS Coordinator,
- ERASMUS Coordinator,
- Alumni,
- Officers for Undergraduate and Graduate Studies,
- Full-time teaching staff,

- Assistants and junior researchers,
- Head of doctoral programme and leaders of research projects,
- Representatives of the business sector, potential employers.

Croatian members of the Expert Panel participated in the preliminary site visit to the higher education institution on 25 March 2021, during which they visited the laboratories, the library, computer rooms, the Students' Office and classrooms, and they attended sample lectures, where they held a brief Q&A session with students.

During the preliminary site-visit, the Expert Panel examined the available additional documents and study programme descriptions (learning outcomes).

The Expert Panel drafted this Report on the re-accreditation of the Department of Biology of Josip Juraj Strossmayer University of Osijek on the basis of the Department of Biology of Josip Juraj Strossmayer University of Osijek Self-evaluation Report, other relevant documents, the preliminary site visit and online meetings.

The Report contains the following elements:

- Short description of the evaluated higher education institution,
- Brief analysis of the institutional advantages and disadvantages,
- List of institutional good practices,
- Analysis of each assessment area, recommendations for improvement and quality grade for each assessment area,
- Detailed analysis of each standard, recommendations for improvement and quality grade for each standard,
- Appendices (quality assessment summary by each assessment area and standard, and site protocol),
- Summary.

In the analysis of the documentation, preliminary site visit to the Department of Biology of Josip Juraj Strossmayer University of Osijek, online meetings and writing of the Report, the Expert Panel was supported by:

- Frano Pavić, coordinator, ASHE,
- Vlatka Šušnjak Kuljiš, assistant coordinator, ASHE.

On the basis of the re-accreditation procedure conducted, and with the prior opinion of the Accreditation Council, the Agency issues a following accreditation recommendation to the Minister for Higher Education and Science:

1. **issuance of a confirmation on compliance with the requirements** for performing the activities, or parts of the activities
2. **denial of license** for performing the activities, or parts of the activities
3. **Issue a letter of expectation** with the deadline for resolving deficiencies of up to three years. A letter of expectation can include the suspension of student enrolment within a set period.

The accreditation recommendation also includes a quality assessment of a higher education institution, and recommendations for quality improvement.

SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION

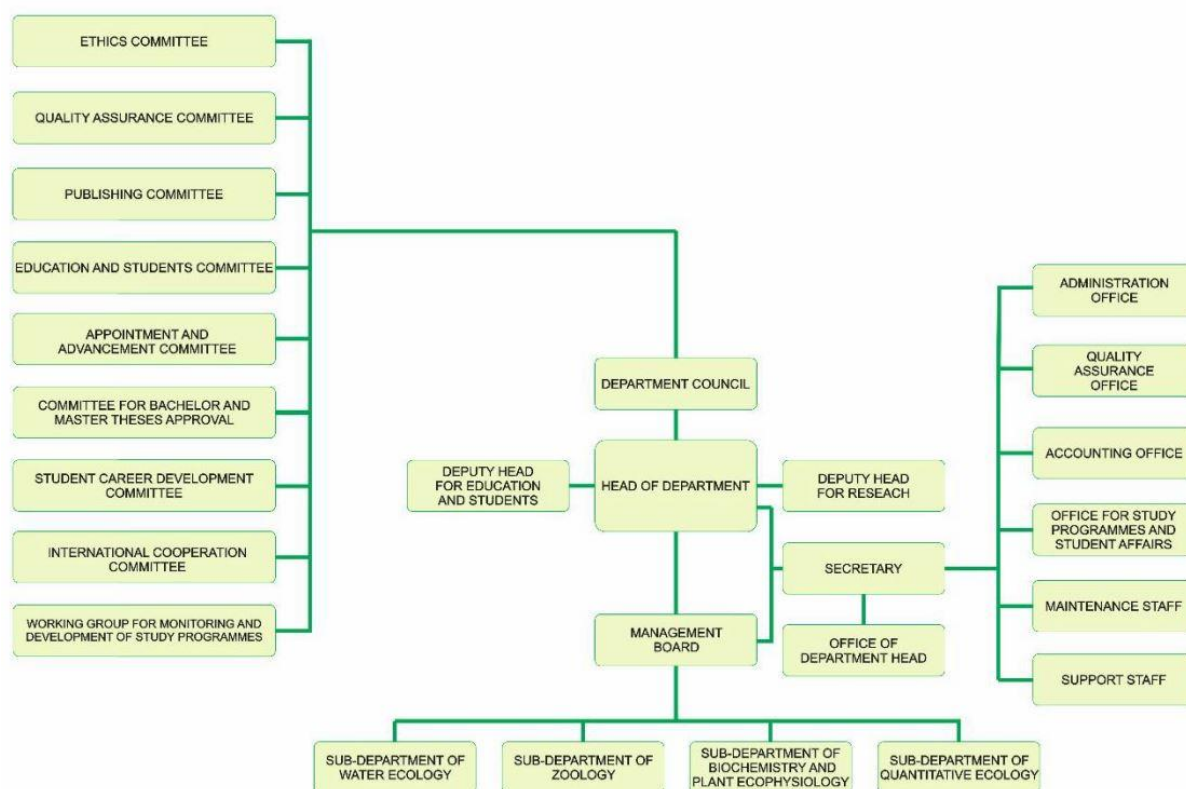
NAME OF HIGHER EDUCATION INSTITUTION: Josip Juraj Strossmayer University of Osijek– Department of Biology

ADDRESS: Ul. cara Hadrijana 8/A, 31000 Osijek

HEAD OF DEPARTMENT: Assoc. prof. Ljiljana Krstin, PhD

ORGANISATIONAL STRUCTURE:

From Self-evaluation report (p. 2).



STUDY PROGRAMMES:*Based on MOZVAG data.*

No.	Name of study programme	Type of study programme	Institution responsible for the delivery of the study programme	Number of ECTS	CROQF Level
1.	Biology	Undergraduate university study programme	Department of Biology of Josip Juraj Strossmayer University of Osijek	180	6
2.	Biology, specialisation in research	Graduate university study programme	Department of Biology of Josip Juraj Strossmayer University of Osijek	120	7
3.	Biology and Chemistry, specialisation in education	Graduate university study programme	Department of Biology of Josip Juraj Strossmayer University of Osijek	120	7
4.	Nature and Environmental Protection	Graduate university study programme	Department of Biology of Josip Juraj Strossmayer University of Osijek	120	7

NUMBER OF STUDENTS:

The number of students per study programme for the current academic year is presented in table 3.1. of the Analytical Supplement to the Self-evaluation Report (p. 2).

Name of study programme	Full-time students	Part-time students
Biology (995)	186	0
Total number of students at the undergraduate level	186	0
Biology, specialisation: research (996)	44	0
Biology and Chemistry, specialisation: teaching	23	0
Nature and Environmental Protection (998)	24	0
Total number of students at the graduate level	91	0
Total number of students at the undergraduate and graduate level	277	0
Total number of all students	277	

NUMBER OF TEACHERS:

The structure of the teaching staff is specified in Table 4.1.a of the Analytical Supplement to the Self-evaluation Report (p. 7).

Staff	Full-time employees	Part-time employees (cumulative employment)	External associates
Full-time professors with tenure	1	1	2
Full-time professors	3	1	-
Associate professors	9	-	6
Assistant professors	18	-	8
Scientific Advisors with tenure	-	-	-
Scientific Advisors	-	-	-
Senior Scientific Advisors	-	-	-
Research Associates	-	-	-
Appointment to teaching grades	-	-	1
Assistants	5	-	3
Postdoctoral researchers	3	-	1
Project staff	5	-	-
Professional associates	6	-	-
Technical staff	3	-	2
Administrative staff	12	-	-
Assistant staff	5	-	-

THE OFFICIAL REGISTER OF SCIENTIFIC ORGANISATIONS

Scientific field of natural sciences.

SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION

The short description is based on information from the Self-evaluation Report (p. 1).

Department of Biology of Josip Juraj Strossmayer University of Osijek (hereinafter: University of Osijek) was established on the 1st April 2005. The Department of Biology is the legal successor of the Institute of Biology of the Faculty of Education of the University of Osijek, which was established in 1984 from the Chair of Biology. The Chair of Biology was established in 1977 for the purpose of providing higher education in biology. During the first seven years of activity the Department of Biology was located at the address Trg Ljudevita Gaja 6 in Osijek. In February 2012 the Department moved to the University Campus, in building No. 3 at the address Ulica cara Hadrijana 8/A.

Although the Department of Biology (hereinafter: Department) is a young constituent member of the University of Osijek, it successfully educates young researchers, teachers and masters of nature and environmental protection, and is recognised for the successful scientific and professional work of its employees.

Mission

The mission of the Department is to educate excellent experts and scientists in the field of natural sciences, in the scientific area of biology and to achieve excellence in basic and strategic researches with significant social influence. By investing in education and research and by putting emphasis on excellence in scientific work, the Department aims to achieve a better position in the internationally competitive academic community.

Vision

The vision of the Department is to strengthen its position among higher education institutions and scientific-research institutions in the country and the wider region by continuously raising the quality of delivered higher education teaching and research work. By introducing new study programmes and research projects, the Department strengthens cooperation with the economy sector in the field of biology, biotechnology and environmental protection, thus making these issues a recognisable priority in the upcoming period, both at national and European level.

BRIEF ANALYSIS OF THE INSTITUTIONAL ADVANTAGES AND DISADVANTAGES

ADVANTAGES OF THE INSTITUTION

1. Advantageous student - teacher ratio (8:1).
2. Large number of teachers and administrative and support staff that help in the research and teaching process.
3. Good working and spatial conditions, well-equipped training facilities and classrooms.
4. Good cooperation with the local community (numerous professional projects) and applied science.
5. Location within the campus and the proximity of the Department of Chemistry is an excellent potential for establishing teaching and scientific cooperation.
6. Young and dynamic staff.

DISADVANTAGES OF THE INSTITUTION

1. The scientific work of certain teachers is not compatible with their teaching area and does not show that they have the competencies necessary to carry out the courses they have been assigned.
2. The scientific work of numerous younger researchers (assistant professors) does not indicate scientific excellence.
3. Insufficient international mobility of academic staff.
4. Insufficient scientific recognisability at international level.
5. Insufficient inclusion of teachers in international projects.
6. Lack of strategic partnerships with international scientific institutions and lack of implementation of basic cooperation with national scientific institutions.
7. Inefficient use of project funds (projects resulting in no scientific publications cited in WoS).
8. Insufficient communication between students and the Department's competent staff.
9. Lack of standardised internal surveys.

LIST OF INSTITUTIONAL GOOD PRACTICES

EXAMPLES OF GOOD PRACTICE

1. Career counselling for students provided by the Student Career Development Committee.
2. The work of the Alumni BiolOs Association which also publishes its annual bulletin.
3. The Alumni-mentor project.
4. Advertising of job offers at the display in one of the Department's hallways.
5. Publication of information regarding graduate theses on the Department's website in the form of a poster campaign.
6. Tutoring system (student tutors).
7. Good and motivating relationship with students.
8. Good cooperation with Kopački rit Nature Park.
9. Rewarding of accomplishments and published students' works.

ANALYSIS OF EACH ASSESSMENT AREA, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH ASSESSMENT AREA

I. Internal quality assurance and the social role of the higher education institution

Analysis

The Department of Biology has set up a sufficiently organised internal quality assurance system, which includes a Quality Assurance Office and a Quality Assurance Committee, whose activities are based on documents adapted to old and new ESGs as well as relevant documents of the Department of Biology and the University of Osijek. The majority of necessary regulations, strategies and other documents regulating the work of the quality assurance system is adopted and published on the Department's website. Besides teachers, the internal quality assurance system formally includes also a student and two external stakeholders, but the contribution of external stakeholders to the preparation of strategic documents is not visible at the moment.

The activities of the quality assurance system are aimed mostly towards the teaching process and provision of support to students and teachers, but the system hasn't so far dealt with the systematic monitoring, analysing and stimulation of scientific-research activities, international cooperation, professional work, the Department's social role and of all other parts of the Department of Biology's scope of work. The strategic documents define well the planned goals and activities and the implementation of the Strategic Programme for Scientific Research for the period 2017-2021 is monitored through an annual report adopted by the Department Council. Nevertheless, the structure of the report does not show the implementation of planned activities according to research topics, projects and individual teachers, nor does it provide statistics and comparative analyses of previous reports, which makes difficult to observe upward or downward trends for certain activities. The Department documents the partly monitoring of the staff's performance and the connected rewarding system for employees, which has its shortcomings and needs to be improved and upgraded.

Although the monitoring of students' opinions and views is documented by a series of conducted surveys, it seems that there are no significant reactions from the Department Management Board, i.e. they do not reach decisions based on the results of the surveys. The Department has established contacts with graduated students and these contacts are adequately maintained through the Alumni Association; however, at the moment the Department doesn't use feedback from graduated students or employers in the development of study programmes, the adoption of strategic documents or for other activities.

The Expert Panel concludes that the Department of Biology has only partly implemented the recommendations for improvement given by the Expert Panel in the re-accreditation procedure conducted in 2015, in particular those regarding the reorganisation of the graduate study programme in Biology and Chemistry Education and the overall profile of the scientific-research activity of the Department.

The Department has appointed an Ethics Committee, adopted the necessary documents and defined the procedures which support academic integrity and freedom and uphold ethical standards. However, there is no evidence on the efficient use of mechanism for the prevention of unethical behaviour because the Ethics Committee has no recorded activity in the past five-year period.

The Department's web page is very informative and ensures to students and the interested public the visibility of most of the relevant information on study programmes and studying as well as other Department's activities in Croatian and in English language.

Besides for the education of experts in the field of biology, the Department is recognised by the public for its environmental and educational activities through which it contributes to the development of the local community, while at present the Department's contribution to the development of the economy is not visible enough.

Recommendations for improvement

The Department should continue to carry out and further intensify activities aimed at the development of the quality assurance system, and regularly report on these activities to the Department Council. It is recommended to hold more than one or two joint meetings per year and to develop and encourage a greater number of activities as defined by the Quality Assurance Policy. It is necessary to publish the results of the annual internal audit of the quality assurance system of the Department of Biology on the Department's website, prepare a follow-up plan and systematically work on addressing the shortcomings that were detected during the internal audit of the Department's quality assurance system.

The activities of the Quality Assurance Committee must be further extended to the scientific-research and professional work of the Department. It is recommended to develop more efficient mechanisms for monitoring and reporting on the implementation of the Strategic Programme for Scientific Research in order to monitor the implementation according to research topics, projects and also individual teachers, which would allow to stimulate the teachers that prove to be the least active. The current rewarding system for scientific excellence needs to be further improved and organised, for example by adopting a special Ordinance on the rewarding of teachers and associates

according to which, besides the Q1 quartile in which the journal where the paper is published is indexed, other parameters such as first and corresponding authorship, the number of co-authors, the number of scientific papers published in one year, impact factor are taken into consideration and assessed.

It is necessary to improve the procedures for collecting information and their presentation to the Department Council and the general public. Guidelines regarding student surveys should be more precise, and students must be granted with anonymity during the implementation of surveys. In order to encourage a more active participation of students in the work of the quality assurance system, it is recommended to achieve some concrete results and implement activities on the basis of survey results.

It is recommended to take into account the recommendations of both re-accreditation expert panels (from 2015 and 2021) regarding the fact that courses in the field of chemistry should be held by chemistry teachers, and that the practice which sees a larger number of courses in the field of chemistry being held by biology teachers at the Department of Biology is unacceptable. Since this issue, which was recognised during the first and second re-accreditation cycle, was not resolved in a satisfactory manner, the Expert Panel recommends that the coordination of the graduate study programme in Biology and Chemistry Education should be done at the level of the University of Osijek instead of at the level of the Department of Biology.

In order to develop those areas of the biological science that at the moment are not sufficiently developed, it is recommended that the Department of Biology carries out the restructuring of its four sub-departments having regard to the Ordinance on Scientific and Art Areas, Fields and Branches, according to which the scientific field of biology includes the following branches: biochemistry and molecular biology, botany, zoology, microbiology, ecology, genetics, evolution and phylogeny.

Furthermore, it is necessary to pay great attention to the development of human resources at the Department as the scientific activity of the current teaching staff was evaluated as average and poor, with only a few above average successful teachers. In particular, the full-time employment (of new assistant professors) should be strategically planned and focused on the development of currently poorly developed scientific areas such as genetics, the research of biodiversity and evolution and microbiology, but also other new scientific disciplines which are still being developed. It is necessary to devise additional criteria for advancement and employment against which the Department will assess excellence in scientific-research work, publishing papers as first or corresponding author and professional development abroad in the minimal duration of several months.

In relation to the implementation of a unified University Student Survey, it is necessary to define the lowest grade a teacher needs to get for his/hers employment, i.e. advancement.

The absolute inactivity of the Ethics Committee due to the lack of reported cases of violation in the previous five-year period, may indicate the inefficiency of the whole system for reporting and eliminating various forms of unethical behaviour, intolerance and discrimination. The Quality Assurance Committee should investigate this matter and adopt appropriate measures.

The Department should work on attaining greater visibility on national and international level. It is recommended to plan more appearances on public television, in the press and other media, as well as in professional and popular science programmes. The Department needs to nominate more often its teachers for national and international awards.

It is recommended to intensify the implementation of activities focused on the development and realisation of a larger number of scientific and professional projects with the aim of establishing a closer connection with the industry and the local community, while monitoring the needs of the labour market.

Upon issuance of the necessary permissions, it is recommended to start delivering as soon as possible the proposed lifelong learning programme and at the same time start to monitor and develop the quality of the delivery of this programme on the basis of feedback collected from participants and employers.

Quality grade:

Satisfactory level of quality

II. Study programmes

Analysis

The Department of Biology has good working conditions and spatial capacities. Nevertheless, despite the good spatial and staff capacities, the enrolment quotas exceed the number of students interested in studying at the Department as well as the needs of the labour market for professionals of that profile. The graduate study programme in Biology has the best pass rates which is also true for the graduate study programme in Biology and Chemistry Education. The interest for and completion rates on the study programme in Nature and Environmental Protection are extremely low compared to other study programmes. The trend of decreasing interest for study programmes and lower pass rates on certain study programmes indicate the need to carry out necessary

changes, such as the rationalisation of study programmes, establishing cooperation with other departments or the rationalisation and merging of study programmes.

The undergraduate study programme in Biology shows certain shortcomings with regard to trends and current scientific knowledge in the area of biology.

The Department has initiated a successful revision of learning outcomes. In the majority of undergraduate and graduate study programme syllabi, learning outcomes correspond to levels 6 and 7 of the CROQF. In certain syllabi the defined learning outcomes are still missing. The provided examples of evidence on learning outcomes are in accordance with the revised learning outcomes.

The Department has partially involved the Department of Chemistry in the delivery of the graduate university study programme in Biology and Chemistry Education, thus making the content of this programme more unified. For the next academic year (2021/2022), the Department has proposed new elective courses and changed the status of the course in English language from elective to obligatory.

It is recommended to carry out a revision of the allocated ECTS points and active (contact) hours of teaching at the level of the semester/academic year. During the analysis of individual study programmes, the Expert Panel has found in the curricula information on the active teaching hours - contact hours with students during class (lecture, practice, seminar), but data on hours of individual work of students is missing. Out of 900 hours of student work, active (contact) teaching (lecture, practice, seminars) amounts to between 225 and 510 hours per semester. All hours exceeding 390 are above the prescribed limit for active teaching (Ordinance on studies and studying at the University of Josip Juraj Strossmayer in Osijek, art. 49, p. 23 and Self-Evaluation Report, 2021, p. 32).

Student professional practice is an obligatory part of the study programme and is carried out at the Department of Biology or in various institutions in the public and private sector on the basis of signed contracts and agreements. During their internship, students keep a record of student practice.

Recommendations for improvement

Considering that the number of enrolled students is regularly lower than the enrolment quotas, and this is especially true for the graduate study programmes in Biology and Chemistry Education and Nature and Environmental Protection, the Expert Panel recommends to work on the optimisation, enhancement of the quality and visibility and the promotion of the programmes. The trend of decreasing interest for study programmes and lower pass rates on certain study programmes indicates the need to carry out

necessary changes, such as the rationalisation of study programmes, establishing cooperation with other departments or the merging of study programmes.

The Department of Biology should carry out a revision of the allocation of ECTS credits. All hours above 390 exceed the prescribed number of hours of active teaching. (Ordinance on studies and studying at the University of Josip Juraj Strossmayer in Osijek, art. 49, p. 23 and Self-Evaluation Report, 2021, p. 32).

Due to shortcomings in the undergraduate study programme in Biology, the Expert Panel recommends to transfer the obligatory course in Microbiology to a higher year of study and to allocate to it a higher number of ECTS credits. The Expert Panel also recommends to split the obligatory course in Genetics in two courses with a higher number of allocated ECTS credits. The Expert Panel recommends that the course *English language 1 and 2* be included in the offer of elective courses. Furthermore, the Expert Panel considers that competencies regarding the use of English language need to be improved by insisting that potential students have a higher level of English in their high school diploma and through the continuous acquisition of professional English language on all courses of each study programme. The obligatory course Physical Education could be part of students' extracurricular activities.

The Expert Panel recommends to revise the syllabi for the courses *Student Practice* and *Field Work* in order to adjust learning outcomes to the requirements of the Croatian Qualifications Framework.

It is necessary to prepare course syllabi in English for foreign students, introduce other forms of teaching, presentation and reporting on completed student practice and to apply different assessment methods.

The Expert Panel recommends to transfer the coordination of the graduate study programme in Biology and Chemistry Education to the University level, instead of the Department of Biology level.

The Expert Panel also recommends to carry out an analysis of the delivery of elective courses on all study programmes in the last few years and to eliminate the programmes which haven't been delivered.

The Expert Panel recommends to keep better records on the inclusion of students in the Department Council. The Department needs to complete study programme descriptions and review the hours of active teaching (contact) in the syllabi of obligatory and elective courses, and add information on the hours of individual student work.

The Expert Panel recommends to prepare clear instructions on the modes of implementation of student practice as well as eligibility criteria for mentors, and to define rules for the compilation of reports on the completed practice and for the final presentation. It is necessary to harmonise professional instructions for the implementation of students practice and field work with learning outcomes and teaching activities.

Quality grade

Satisfactory level of quality

III. Teaching process and student support

Analysis

The Expert Panel has established that the Department's website is very informative for students. The website contains information about the requirements future students, amongst them foreign students and students over the age of 25, must meet in order to enrol in one of the Department's programmes. One of the requirements is to pass the lower (B) level in English language at the State Matura Exam, and the Expert Panel considers that this level of knowledge of English does not sufficiently prepare students for the use of literature in English. During the meeting with students, the Expert Panel learned that certain students avoid using literature in English while studying. Furthermore, the Department's web page contains an information package providing information on requirements for enrolling to a higher year of study or one of the graduate study programmes, the possibility to repeat a study year or to obtain a dormant status. The Education and Students Committee decides on all students' requests (recognition of ECTS credits, taking differential exams, obtaining a dormant status, etc.).

Data on student progress is mainly collected by teachers through all forms of teaching. The Quality Assurance Committee collects data on student pass rates, completion rates and drop-out rates by using the ISVU system as a source of information and ECTS credits as the main indicator of progress. On the basis of analysed data and students' propositions, the Department continuously carries out partial revisions of study programmes by introducing new elective courses.

Interactive and research learning, according to students, is mainly encouraged through field work and practice, but also during lectures on certain courses which include problem-based learning. Furthermore, seminars also greatly contribute to the achievement of this, but their usefulness for students or teachers is doubtful considering

that certain seminars are not evaluated in any way. The Quality Assurance Committee develops student surveys through which students express their opinion on the quality of teaching, the work of the teachers, reasons for quitting the study and similar, and they can add their own comments. Students also complete the University Student Survey, the results of which are available to the head of the Department and each teacher separately. The Expert Panel found out that the best graded teachers were rewarded, and if one of the teachers received poorer or unsatisfactory grades, the head of Department can impose potential sanctions if they believe that this impairs the quality of the Department's work. The problem with this system lies in the fact that, according to what they told the Expert Panel, students have not noticed any improvements or changes resulting from their assessment. Additionally, the practice is that teachers conduct their own surveys. Students' motivation for completing surveys is minimal, because they feel that they don't have the power to initiate any changes. Although all teachers are, in a way, available to the students, classes are not held regularly for all courses, which has not been sanctioned.

The Office for Student Affairs is the intermediary between students and all offices of the Department. Moreover, students of the undergraduate study programme address the study year coordinators with their difficulties and needs, but they do not sufficiently communicate with their student representatives and do not show enough motivation to address competent staff and offices. Students have at their disposition many offices offering them services such as psychological counselling, legal counselling, support for students with disabilities, assistance with mobility programmes, as well as a Library and an Office for Student Affairs; students are familiar with all options, but they are not satisfied with them.

Through its offices and services, for e.g. psychological counselling, the Department provides equal help to all student groups. Students with disabilities can seek help from the Office for students with disabilities at the level of the University. The Department has so far had experience with students with milder motor impairments which didn't prevent them from attending any kind of classes. Students over the age of 25 attend classes with all other students and, if needed, the Department organises additional time slots for attending classes. When it comes to forwarding questions posed by students from vulnerable and underrepresented groups of students, the discretionary conduct is allowed thanks to the work of the data protection officer and the information officer, but students are not familiar with their work.

Students of the Department participate in CEEPUS, IAESTE and Erasmus+ mobility programmes (mostly) for the purpose of studying or completing a professional internship. Workshops are held in order to promote these programmes (according to students' impressions, at the moment not enough is being done regarding this matter),

and students who participated in one of the programmes share their experience with other interested students.

Foreign students at the Department are assigned with a student-guide, and all information on the study programme (and courses held in English), including the information package, is available in English on the Department's website. If the number of foreign students is low, courses are replaced by consultation hours, while student practice is carried out in English for Croatian and foreign students alike.

Upon completion of their studies, students are issued a diploma and diploma supplement in accordance with the Ordinance on Studies and Studying. For each academic year, the Department analyses the employability of students. Enrolment quotas are determined according to the Department's capacities and the interest of candidates for enrolment to studies during previous years, but the quotas are approved by the University's Senate. Considering that students are not sufficiently oriented towards the European market and that the interest of candidates for some of the study programmes is decreasing, the enrolment quota for the undergraduate study programme is too high. The information on opportunities for the continuation of studies or employment upon completing their studies is available to students on the Department's website, on the display in the Department's premises, through the Alumni BiolOs Association, during the Career Week and through the Student Career Development Committee.

Recommendations for improvement

Regarding the requirements for enrolling to the undergraduate study programme, the currently required B level in English language at the State Matura Exam should be raised to the higher, A level. Students should receive feedback on each completed assignment, at least in the form of comments. Upon receiving the results of the Unified University Survey, if there are constructive, and especially numerous comments on the specific behaviour of a particular teacher during teaching or assessment, the Department head and teachers are supposed to change existing teaching methods or influence their change so that such changes are obvious students. The Department should review its capital equipment and procure devices available to other universities, in Croatia and abroad, which are engaged in research and teaching on the same and similar topics, e.g. an electron microscope. At the moment of verifying the mandates of other Department Council members for each academic year, the representation of students should be at least 15%, meaning that the number of student representatives should be revised as necessary. Students should be provided with more workshops that would present calls for different mobility programmes. It would be good to develop feedback mechanisms for BiolOs Alumni members about their own study (advantages and disadvantages), in order to improve the

quality of study for current students. Enrolment quotas need to be revised (according to market needs and student interest).

Quality grade

Satisfactory level of quality

IV. Teaching and institutional capacities

Analysis

The Department of Biology employs an appropriate number of teachers appointed to scientific-teaching grades. Considering that the ratio between students and full-time teachers is exceptionally favourable, it is unusual that several teachers have an excessive teaching workload. This is maybe partially due to the ratio of teachers and younger associates (assistants, doctoral students, post-doctoral students), which is on the contrary very unfavourable. Despite the recommendation issued by the previous re-accreditation expert panel to increase the number of doctoral students, the total number of younger teaching and scientific staff was halved.

The main complaint from the previous re-accreditation procedure concerns the competencies of teachers delivering chemistry courses. The Panel explicitly highlighted that those courses need to be taught by teachers who are chemists by vocation. Despite the fact that this issue was specifically pointed out in the previous re-accreditation procedure, the only notable reaction from the Department was to appoint two teachers to scientific-teaching grades in the interdisciplinary field of biology and chemistry. On the Department's website, in the section dedicated to the graduate study programme *Biology and Chemistry Education*, several chemistry courses have holders that are not included in the official list of teachers that was submitted to the Agency. Finally, the question remains about whether teachers with doctoral degrees in biology, appointed to scientific-teaching grades in the interdisciplinary area, are competent holders of courses such as *General and Inorganic Chemistry*, *Organic Chemistry*, *Basic Practice in General Chemistry*, etc. (since these disciplines do not belong to the interdisciplinary area).

Unfortunately, the issue concerning teachers' competencies is now clearly visible in biology courses too. The issue has significantly worsened due to the mass employment of new teachers. These teachers have been appointed to the scientific-teaching grade of assistant professor on the basis of minimal quantitative criteria (the number of publications in which they are listed as authors), without any kind of verification of their contribution as authors or the application of any other qualitative criteria. The majority of newly appointed assistant professors hasn't published a paper as first author, and most

of the papers were published in low impact journals. Finally, the scientific work of newly appointed assistant professors, but also certain associate professors, is extremely heterogeneous and often unrelated to the content the course they hold. The role of the holder of several courses is not based on competencies acquired by publishing in a determinate scientific discipline.

Spatial capacities, as well as the equipment and overall infrastructure, could be better, but the Panel's impression is that they generally satisfy the basic needs of students and scientific-teaching staff. The Department is situated within the University campus and in the proximity of the Department of Chemistry, which creates the impression of a positive environment that offers a great potential for different forms of cooperation.

Despite the fact that this thematic area as a whole was assessed as satisfactory level of quality, the Department should be warned by the fact that the key standard concerning teaching capacities was assessed as minimum level of quality.

Recommendations for improvement

The Department should change its employment and appointment to scientific-teaching grades strategy and harmonise it with the Department's mission as stated in the Self-evaluation Report. A serious commitment to excellence will be needed to break out from a situation where the competencies of a large number of teachers are not sustained neither by quality scientific work nor by recognised scientific discipline.

Quality grade

Satisfactory level of quality

V. Scientific/artistic activity

Analysis

After the previous re-accreditation procedure, the Department of Biology has developed the Strategic Programme for Scientific Research 2017-2021, which includes the analysis of the advantages and drawbacks of scientific research and sets the goals and procedures for the future development of this activity. However, the set goals are general and the Department hasn't analysed the attainment of the set goals, i.e. whether the defined research topics have resulted in the appropriate scientific output. The Expert Panel notes that despite the larger number of publications and projects, the recommendations of the previous re-accreditation panel for the improvement of scientific activity were not adequately implemented. It is necessary to significantly improve the implementation of the Strategic Programme by certain research teams at the Department.

The scientific productivity of the Department of Biology is low to average, in both the number and quality of scientific publications (the h-index in WoS is 28 and the total number of citations is 2864), as well as the number of considerable scientific projects that are not funded from internal University funds. Each teachers publishes in average 0.88 scientific papers per year, which is very modest in comparison with the international (European) average. The Panel notes a quite significant difference in the scientific output of individual teachers and certain teachers do not engage at all neither in scientific activities nor in the publication of papers indexed in WoS, especially as first authors or lead (last) authors, which is very concerning. On the other hand, the Panel commends the teachers who do a notable and internationally visible scientific work (WoS papers and large projects).

Furthermore, it is concerning that as a result of several scientific projects, there were no scientific papers published in journals indexed in WoS. This particularly relates to projects funded by the Josip Juraj Strossmayer University of Osijek and the Department of Biology, which raises the question regarding the way in which project applications were evaluated and how their output was evaluated. Another negative occurrence is that for certain scientific branches in the field of biology that are present in the teaching plan, there is no registered, internationally relevant scientific activity, which questions whether certain teachers are qualified at all for holding the courses they are responsible for.

The scientific activity is focused on applied biology, which is positive, but it is necessary to supplement this activity with basic scientific research in all branches of biology that are represented in the teaching plan. The Department should put in more effort in the cooperation with other departments and faculties which are part of the University and other institutions in Croatia, as well as in establishing international cooperation and in the implementation of scientific activities at recognised foreign institutes and universities.

The Panel commends the inclusion of students in the scientific work, but they should also have the opportunity to conduct scientific research in areas that are not currently represented in the University's scientific portfolio. The Panel would also like to highlight the professional and partly scientific cooperation with representatives of the industry or the nature protection sector in the region, and the efforts aimed at popularising science, so that the Department shows a satisfactory level of social relevance.

Recommendations for improvement

- It is recommended to develop a functional system of regular monitoring of scientific activities and output, at the level of the Department as well as the individual Sub-departments.

- It is recommended to restructure the internal organisation of the Department (sub-departments) and to stimulate the networking of teachers with similar specialisations in biology in new sub-departments according to the main biology branches: biochemistry, molecular biology, botany, microbiology, zoology, ecology, molecular genetics, evolution, phylogeny and general biology. Newly created Sub-departments need to plan short-term and long-term scientific activities and form teams that will work on specific fields of biology.
- It is recommended to stimulate internationalisation (scientific visits to recognised national and international institutes).
- It is recommended to stimulate scientific activity in general biology and in all main branches of biology that are included in the teaching plan.
- It is recommended to improve the internationally visible scientific output of smaller (Department and University-led) projects.
- It is recommended to stimulate the production of scientific papers (more first and last authorships).
- It is necessary to enhance the output of teachers with low or non-existent scientific output (those who have a significant scientific activity should keep up the good work)
- It is recommended to tighten the scientific criteria for advancement and even for employment of new staff (assistants and assistant professors).
- It is recommended to stimulate students of graduate studies to participate more actively in the writing of scientific papers (as part of their graduate thesis research).
- It is recommended to reward only particularly notable scientific excellence.

Quality grade

Minimum level of quality

DETAILED ANALYSIS OF EACH STANDARD, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH STANDARD

I. Internal quality assurance and the social role of the higher education institution

1.1. The higher education institution has established a functional internal quality assurance system.

Analysis

The Department of Biology's internal quality assurance system includes the Quality Assurance Committee and the Quality Assurance Office. The Quality Assurance Committee is an expert body of seven members established by the decision of the Department Council. Three members are representatives of the teaching staff, one is the representative of the assistants, one is the student representative and two members are representatives of external stakeholders. The Quality Assurance Office has two employees, one is the Head of office and the other an administrative officer. The Department's quality assurance system is based on documents harmonised with old and new ESG standards and the relevant documents of the University of Osijek. On the Department's web page and in the Self-evaluation Report the following documents are listed:

- Ordinance on the Organisation and Operation of the Quality Assurance System of the Department of Biology, adopted in September 2014.
- Quality Assurance Policy, adopted on 15 October 2014.
- The Department of Biology has not developed a quality assurance manual and the Panel thinks that they should develop one, unless the Department has made different arrangements with the Quality Assurance Centre of the University of Osijek; at the level of the Department the quality assurance manual of the University of Osijek is being used.
- The quality assurance system internal audit is carried out by the Quality Assurance Centre at the level of the University of Osijek and the Quality Assurance Office and Committee of the Department of Biology; the audit is implemented by collecting and analysing information from the University Report on the Functioning and Efficiency of the Quality Management System. The results of the internal audit cannot be found on the Department's website, where they should be, but on the website of the University's Quality Assurance Centre. The analysis of the report for the previous four years has shown that part of the activities was not realised. The Panel didn't find a follow-up plan (as required by the ESG standards) that would envision the realisation and

enhancement of activities aimed at developing the areas that were assessed as less developed.

- Action Plans of the Quality Assurance Committee for four academic years: 2017-2018, 2018-2019, 2019-2020, 2020-2021.
- Reports on the realisation of Action Plans of the Quality Assurance Committee for three academic years: 2017-2018, 2018-2019, 2019-2020.
- Minutes of the Quality Assurance Committee sessions.
- Annual professional training plans for members of the Quality Assurance Committee and Quality Assurance Office.
- Action Plan for Improvement and Assurance of Quality 2016-2020.
- Reports on the implementation of the Action plan for Improvement and Assurance of Quality for three academic years: 2017-2018, 2018-2019, 2019-2020.
- Development Strategy of the Department of Biology 2019-2024.
- Strategic Programme for Scientific Research 2017-2021 including 20 strategic topics.
- Annual Reports on the realisation of the five-year Strategic Programme for Scientific Research for the academic years 2017-2018, 2018-2019, 2019-2020, which are mentioned in the Self-evaluation Report, are not visible on the Department's website. However, on the Department's website, in the Science section are visible annual lists of papers published in Q1 journals, a list of projects (scientific and professional), cooperation and similar information, which is a good practice.
- Survey results: seven internal surveys were carried out and also the cumulative results of the uniform University Student Surveys are visible.

The quality assurance system at the Department of Biology was set up in 2012, but the intensifying of activities was noted only from the academic year 2016/2017, which is quite late considering that the Act on Quality Assurance in Science and Higher Education was adopted in 2009. From the meeting with the Head of the Quality Assurance Unit it is visible that the recent employment of the Head of the Quality Assurance Office has significantly contributed to the revival of activities of the whole quality assurance system at the Department of Biology. However, the Panel noted a kind of fragmentation of the quality assurance system in three parts: 1) the University part that is implemented by the Quality Assurance Centre (internal audit and key documents such as the quality assurance manual), 2) Head of the Quality Assurance Office who is in charge of monitoring the quality of study programmes, teaching process and evaluation of student achievements, implementing students surveys, analysing pass rates and student progress, monitoring student mobility, as well as collecting other information and 3) the Quality Assurance Committee that adopts annual plans and reports on the activities of the Quality Assurance Committee and Quality Assurance Office. The duties of the QA Office's administrative officer are not clear. From the number of minutes of the Quality Assurance Committee

sessions, it is visible that the Committee meets one to two times per year, which is insufficient. The activities of the Quality Assurance Committee and Office are aimed mostly towards the teaching process and provision of support to students and teachers, but these bodies haven't so far dealt with the systematic monitoring, analysing and stimulation of scientific activities, international cooperation and professional work and of all other parts of the Department of Biology's scope of work. The strategic documents define well the planned goals and activities and the implementation of the Strategic Programme for Scientific Research for the period 2017-2021 is monitored through an annual report drafted by the Deputy Head for Research and submitted to the Department Council. The actual structure of the report does not show the individual contribution of each teacher nor the realisation of the programme according to the mentioned 20 scientific topics; the Panel therefore suggests to devise a better way and mechanisms for monitoring and reporting on the implementation of the Strategic Programme.

Although the monitoring of students' opinions and views is documented by a series of conducted surveys, it seems that there are no significant reactions from the Department Management Board, i.e. they do not reach decisions based on the results of the surveys. Students have also had complaints regarding the anonymity of the conducted surveys as they have to enter their AAI electronic identity in order to complete them, which is the reason they fear that they can be identified and that the survey is not completely anonymous. Furthermore, they are dissatisfied with the fact that neither concrete results nor activities implemented on the basis of these surveys can be noticed. The current situation is demotivating for students who do not consider surveys as a serious means for achieving certain goals and they have a superficial attitude towards surveys and fill them as a „box ticking“ exercise, which is not satisfactory. Although students have the possibility to send anonymous remarks/proposals/complaints through a mailbox for students issues placed in one of the Department's hallways, students don't use this form of communication to a greater extent because they don't receive any answers or feedback on the addressed questions/remarks/complaints, and consequently this practice should be improved. The Panel commends the fact that the work of the Quality Assurance Committee is mostly transparent and visible on the website.

Recommendations for improvement

The Department should continue to carry out and intensify the implementation of existing activities aimed at the development of the quality assurance system, and regularly report on these activities to the Department Council. It is recommended to encourage the Quality Assurance Committee to be more active, hold more meetings, cooperate better with other committees, such as the Ethics Committee, and organise and encourage the implementation of more activities defined by the Quality Policy, the Ordinance on the work of the Committee and strategic documents of the Department such as the

Development Strategy (2019-2024) and the Strategic Programme for Scientific Research (2107-2021). It is necessary to better coordinate and integrate all the activities carried out by the Quality Assurance Committee and Office, as well as those carried out by the Quality Assurance Centre at the level of the University. It is necessary to publish the results of the internal audit of the quality assurance system of the Department of Biology on the Department's website, prepare a follow-up plan and systematically work on addressing the shortcomings that were detected during the internal audit of the Department's quality assurance system. The activities of the Quality Assurance Committee must be further extended to the scientific-research and professional work of the Department. It is necessary to improve the procedures for collecting information and their presentation to the Department Council and the general public. The instructions need to be more precise, the survey anonymous and it is necessary to explain to students that there is no way to identify or sanction them in case they submit any complaints. It is recommended to achieve concrete results on the basis of the results of surveys and to communicate them to students and other interested parties. It is necessary to monitor more actively the implementation of the Strategic Programme for Scientific Research, for e.g. according to the 20 strategic topics, but also according to individual teachers, which would encourage the least active teachers to become more active.

Quality grade

Satisfactory level of quality

1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.

Analysis

The conclusion of the present Expert Panel for the re-accreditation procedure carried out in 2021 is that the Department of Biology has partly implemented the recommendations for quality improvement from the evaluation conducted in 2015.

The Expert Panel's Report on the re-accreditation from 2015 has determined that the delivery of the graduate university study programme in Biology and Chemistry Education was of lower quality due to the insufficient number of full-time teachers appointed to scientific-teaching grades. The competent Ministry has issued a letter of expectation with a deadline of up to three years for the elimination of shortcomings in the performance of one part of higher education activities at the Department of Biology. The Accreditation Council has also issued a recommendation to subsequently monitor part of higher education and scientific activities.

The Department Management Board in cooperation with the Quality Assurance Committee has reacted to the Accreditation Council's Recommendation and the Expert Panel's Report on the Re-accreditation of the Department of Biology from 2015 by appointing a special working group for the improvement of quality, an official body for the implementation of improvements, and by adopting several key documents:

1. in accordance with the letter of expectation, a Report on the activities undertaken to eliminate shortcomings in the performance of one part of higher education activities at the Department of Biology was prepared, and on the basis of which the Accreditation Council issued an opinion on the fulfilment of conditions required by the letter of expectation and the Ministry of Science and Higher Education issued a confirmation on the fulfilment of conditions for performing one part of higher education activities at the Department of Biology;
2. Action Plan for Improvement and Assurance of Quality of Higher Education in June 2016;
3. Annual Reports on the implementation of the Action Plan for Improvement and Assurance of Quality of Higher Education (for 2018, 2019 and 2020);
4. Annual Reports on the implementation of the Strategic Programme for Scientific Research (for 2018, 2019 and 2020).
5. A new teacher, specialised in biology and pedagogy, was employed and thus the Department formally fulfilled the requirement according to which the ratio of full-time teachers to external associates has to be over 50% in favour of full-time teachers.

Apart from the above-mentioned, the Expert Panel that conducted the re-accreditation process in 2015 has evaluated as unacceptable the practice which sees several chemistry courses on the graduate study programme in Biology and Chemistry Education delivered not by chemists, but by teachers specialised in biology or other specialisations. The Working Group for the Improvement of Quality and the Quality Assurance Committee have reviewed the syllabus of the graduate university study programme in Biology and Chemistry Education, and then established a partial cooperation with teachers from the Department of Chemistry, which balanced to a certain extent the study programme's content in biology and chemistry. This Expert Panel for the re-accreditation process conducted in 2021, also noticed the unusual practice at the Department of Biology according to which several chemistry courses, even at the undergraduate study programme in Biology, are still taught by biologists. It seems that the cooperation with the Department of Chemistry is still not optimal and that there is room for improvement.

The Expert Panel from 2015 has noticed, amongst other shortcomings, that the Strategic Programme for Scientific Research covers a too narrow scientific area and that it is not connected to modern research in the field of biology. This Expert Panel agrees with this observation and concludes that the scientific-research profile of the Department of

Biology hasn't significantly changed in the last five-year period. A certain narrowness in the choice of topics and the closeness of the Department is still visible, which isn't good because modern biology is unimaginable without strong cooperation with other branches of science belonging to life sciences. Apart the issues regarding chemistry courses held in large measure by biologists, it was noted that courses in physics, mathematics and informatics are also held in large measure by biologists and that the Department hasn't employed practically any expert from those non-biology natural scientific fields. There is a notable scientific cooperation with the Faculty of Agriculture and the Faculty of Food Technology of the University of Osijek, and although this is commendable, the Department risks to invest too much time in applied biotechnical sciences and to consequently neglect fundamental biological sciences.

After the previous re-accreditation procedure, the Department of Biology has developed the Strategic Programme for Scientific Research 2017-2021, which includes the analysis of the advantages and drawbacks of scientific research and sets the goals and procedures for the future development of this activity. The Strategic Programme defines concrete research plans (topics), however it is not clear from the Self-evaluation Report how many of those topics were already realised and what is the scientific output (the number of published scientific papers) of those projects. Moreover, the research topics are very general and descriptive, without concretely defined scientific hypotheses that would be challenged within those projects.

The Head of the Quality Assurance Committee thinks that the Department has implemented all the recommendations given by the Expert Panel in the 2015 re-accreditation process, and this Expert Panel finds it difficult to fully agree with this as, for example, the quality and quantity of scientific work, research topics, scientific projects and cooperation, especially international cooperation, were hardly improved. Apart from the annual Reports on the implementation of the Strategic Programme for Scientific Research, the Department of Biology has no formal mechanisms for monitoring and assessing the quality of the scientific-research work and its influence on the society. The existing activities, such as monitoring the number of activities aimed at the popularisation of science and the number of published scientific papers, and the annual financial rewarding of employees who have published scientific papers in Q1 journals, are a good start for the above-mentioned practice which needs to be enhanced.

From the meeting with the Head of Department, two Deputy Heads, the Department's secretary and the Rector of the University of Osijek, it can be concluded that they are satisfied with the existing situation at the Department of Biology and that they consider that employing additional assistants would contribute to the development of the Department of Osijek's activities. A similar opinion on the need to employ several new

assistants was expressed by several teachers. This attitude is surprising considering that the Expert Panel has provided data on the excellent teacher - student ratio (1:8), and highlighted the fact that the number of enrolled and graduated students on two of three graduate study programmes (Biology and Chemistry Education and Nature and Environmental Protection) is gradually decreasing and is currently lower than 10 students, which is the limit for an economically justified delivery of study programmes. Moreover, the Expert Panel pointed out the fact that study programmes have too many elective courses and hours of contact teaching, and that it is necessary to review study programmes in order to reduce the number of active teaching (lectures, exercises, seminars, field work) to maximally 26 hours per week, as specified by the Ordinance on studies and studying of the University of Osijek.

Through social media and the alumni association, the Department provided evidence on the monitoring of the employability of graduated students and good communication with them, which is commendable. However, from the survey on the employability of graduated students it is visible that they are mostly employed in primary and high schools and at the University, while very few are employed in the so-called real sector. There is no data on the number of graduated students that are employed abroad. The Department shows its commitment to the employability of graduates by participating in the Career Week organised by the University of Osijek and by signing cooperation agreements with interested business entities. Examples of good practice are the section of the Department's website dedicated to Career counselling for students and the work of the Student Career Development Committee, which helps students get numerous information on employment opportunities as well as help with submitting applications, etc.

Recommendations for improvement

The Expert Panel has established that several chemistry courses, on graduate studies as well as on the undergraduate study programme in Biology, are held by teachers appointed to scientific-teaching grades in the field of biology and/or the interdisciplinary field of natural sciences. This Expert Panel supports the opinion of the previous re-accreditation Expert Panel that chemistry courses should be taught by chemists. Since this issue, which was recognised during the first re-accreditation cycle: was not resolved in a satisfactory manner, the Expert Panel recommends that the coordination of the graduate study programme in Biology and Chemistry Education should be done at the level of the University of Osijek instead of at the level of the Department of Biology.

In order to develop those areas of the biological science that at the moment are not sufficiently developed, it is recommended that the Department of Biology carries out the restructuring of its four Sub-departments having regard to the Ordinance on Scientific and Art Areas, Fields and Branches, according to which the scientific field of biology

includes the following branches: biochemistry and molecular biology, botany, zoology, microbiology, ecology, genetics, evolution and phylogeny.

Moreover, the employment of new assistant professors shouldn't be done spontaneously and by fulfilling minimal criteria, but should be done according to a strategic plan and focused on the development of currently poorly developed scientific areas such as genetics, the research of biodiversity and evolution, microbiology and fundamental cellular biology, as well as other scientific disciplines that are insufficiently represented at the Department. It is necessary to devise additional criteria for advancement and especially for full-time employment (of assistant professors), which will encourage the staff to participate in professional development programmes abroad in the minimal duration of several months, as well as to publish papers as first or corresponding authors. In relation to the implementation of a common University Student Survey, it is necessary to define the lowest grade a teacher needs to get for his/hers employment, i.e. advancement.

The current rewarding system for scientific excellence, which rewards all teachers that publish a paper in a Q1 journal regardless on which place they are as co-authors, needs to be further improved and organised, for example by adopting a special Ordinance on the rewarding of teachers and associates according to which, besides the Q1 quartile in which the journal where the paper is published is indexed, other parameters such as first and corresponding authorship, the number of co-authors, the number of scientific papers published in one year and impact factor are taken into consideration.

Quality grade

Minimum level of quality

1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.

Analysis

The preservation and support of academic integrity and freedom and the prevention of all kinds of unethical behaviour, intolerance and discrimination are regulated by national and university laws and regulations, such as the Code of Ethics of the University of Osijek. The Department of Biology regulates the above-mentioned issues also by the Quality Assurance Policy and the Regulation of the Department of Biology. The Department Council has appointed the Ethics Committee in 2017. Pursuant to Article 48 of the Regulation of the Department of Biology, the Ethics Committee should submit annual

reports on its activities and the procedures it conducted to the Head of Department and the Department Council, but those reports were never submitted. On the basis of this, the Expert Panel concludes that the Ethics Committee had no recorded activities in the previous five-year period, which can indicate that all ethical norms were perfectly respected or that teachers, students and staff are not sufficiently informed and willing to use legal possibilities, report irregularities and initiate procedures before the Ethics Committee. The Quality Assurance Committee should find out the true state of affairs by conducting a survey or holding meetings with teachers, students and other employees in order to gather their opinion on the above-mentioned ethical questions. For example, the Expert Panel learned from the meeting with students that there were cases of copying and cheating at tests that remained unpunished.

The Department's employees can use the Turnitin software for discovering cases of plagiarism, i.e. checking the authenticity of papers, but there is no data on how often this software is actually used. Graduate theses are presented on the website in the form of posters, which is commendable.

The Head of Department has appointed officers for the protection of the employees' dignity, for data protection and for confidentiality protection. The Student Union of the Department of Biology has appointed a student ombudsman for all students of the Department, but the Panel learned from the meeting with students that they rarely or never contact the ombudsman when dealing with their problems.

Recommendations for improvement

The absolute inactivity of the Ethics Committee in the last five-year period, without any reported cases, can indicate the lack of trust of teachers, students and staff in the work of the Ethics Committee and the whole system for reporting and eliminating various forms of unethical behaviour, intolerance and discrimination. The Quality Assurance Committee should investigate this matter, for example by conducting a survey or some similar method of research and according to the obtained results, adopt appropriate measures. Furthermore, it is recommended to check whether teachers are familiar with the Turnitin software and how often they use it.

Quality grade

Satisfactory level of quality

1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).

Analysis

The Department ensures the availability of information on teaching, scientific and social activities on its website and through social media: the Department's Facebook and Instagram profile. The Department's activities are also regularly shared by the University News, which is published as part of the *Glas Slavonije* daily newspaper once a month. The University news is also available on the websites of the Glas Slavonije daily newspaper and the University of Osijek. Information on the study programmes and other activities of the higher education institution is publicly available in Croatian and in English. Stakeholders are informed on the admission criteria, enrolment quotas, study programmes, learning outcomes and qualifications, and forms of support available to students. The Department informs potential students and the wider public on study programmes and the activities it carries out at the University Fair, Open Door Day and by holding presentations for secondary school pupils. The Expert Panel commends the newsletter of the Alumni BiolOs association. The website of the Department of Biology and the Alumni association is very informative.

Recommendations for improvement

The Department should continue with all the activities it currently carries out and in addition systematically work to increase the visibility of the Department at national and international level. It is recommended to plan more appearances on public television, in the press and other public media, as well as in professional and popular science programmes. The Department needs to nominate more often its teachers for national and international awards.

Quality grade

High level of quality

1.5. The higher education institution understands and encourages the development of its social role.

Analysis

A large number of teachers successfully cooperates with the local community in order to transfer knowledge and help them make decisions of public interest, such as, for example, mosquito control, monitoring of biological indicators within the landfill, education of the public about the importance of protecting rare habitats and plants. The Department is active in the popularisation of science, from 2014 it has been implementing the Project "Biolog-i-Ja" with lectures aimed at primary and secondary school pupils and interested citizens, the Department also participates in the Brain Awareness Week, the Festival of Science, in the work of the ZOA Association of biology students as well as in many

volunteering activities. An example of good practice is the issuing of certificates to students who participated in activities aimed at popularising science, which are then entered in their Diploma Supplements.

Recommendations for improvement

It is recommended to intensify the implementation of activities focused on the development and realisation of a larger number of scientific and professional projects with the aim of establishing a closer connection with the industry and the local community, while monitoring the needs of the labour market.

Quality grade

Satisfactory level of quality

1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.

Analysis

For the time being, the Department of Biology does not deliver lifelong learning programmes. However, in the Development Strategy of the Department of Biology 2019-2024, one of the strategic goals states the intention to offer a lifelong learning programme for teachers in primary and secondary schools, with which the Department plans to empower teachers for providing successful responses to the challenges in teaching and for an interdisciplinary approach to biological sciences.

For that purpose the Department has drafted a feasibility study for the lifelong learning programme *Pedagogical-psychological-didactic-methodological training in the field of natural science education* that was submitted to the Committee for Lifelong Learning Programmes of the University of Osijek for further procedure. The feasibility study mentions also experts working in the public administration, inspectorates, counselling services and other similar posts as potential participants. It is necessary to note that two similar programmes are already offered within the University of Osijek by the Faculty of Humanities and Social Sciences and the Faculty of Education.

Recommendations for improvement

After the Department has obtained the required licenses, it is necessary to start delivering the proposed lifelong learning programme as soon as possible. It is necessary to monitor and improve the quality of the delivery of that programme from the beginning and to develop mechanism of systematic programme enhancement on the basis of feedback

gathered from attendees and other stakeholders such as employers. Apart from the proposed lifelong learning programme, employees of the Department could devise some other new programmes, such as for example a professional development programme for university teachers, summer schools or similar programmes.

Quality grade

Minimum level of quality

II. Study programmes

2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.

Analysis

The general objectives of all study programmes are in line with the mission and strategic goals of the Department of Biology and the Strategy of the Josip Juraj Strossmayer University of Osijek. The Department of Biology has good working conditions and spatial capacities.

Nevertheless, despite the good spatial and staff capacities, the enrolment quotas exceed the number of students interested in studying at the Department as well as the labour market needs for professionals of that profile.

From 2017 to 2019 the number of students who enrol in the undergraduate study programme in Biology is regularly below the enrolment quota. In 2019, only 46 students were enrolled out of 70 available slots, and in the previous year and the year before that, 74 and 69 students were enrolled out of 75 available slots. The interest for graduate study programmes in *Biology and Chemistry Education* and in *Nature and Environmental Protection* is even lower. In 2019, there were 20 slots available at the study programme in *Biology and Chemistry Education*, and 8 students were enrolled in this programme, while only 7 students enrolled the study programme in *Nature and Environmental Protection*. On the basis of the above-mentioned data, the Expert Panel concludes that there is a trend of decreasing interest for studying at the Department of Biology.

The graduate study programme in *Biology* has the best pass rates which is also true for the study programme in *Biology and Chemistry Education*. In comparison to other study programmes, the interest for and the pass rates on the study programme *Nature and Environmental Protection* are extremely low. The trend of decreasing interest for study programmes and lower pass rates on certain study programmes indicate the need to carry out necessary changes, such as the rationalisation of study programmes, establishing cooperation with other departments or the merging of study programmes.

According to data from the Croatian Employment Service, in 2020 there were 22 unemployed graduates at the national level. In 2019, a total of 39 students graduated at the Department of Biology. This means that in theory at least half of the students found an employment, while the other half didn't find one. All this indicates that the justification for delivering study programmes is only partly compliant with social and economic needs. Based on the recommendations issued by the previous Expert Panel from 2015, the Department established a Working Group for Monitoring and Development of Study Programmes, an official body for the implementation of improvements. The Working Group and the Quality Assurance Committee have started their work by (1) conducting a revision of ECTS credits, (2) introducing an English language course as an obligatory

course on the 1st year of the undergraduate study programme, (3) introducing new elective courses and (4) conducting a revision of learning outcomes on all study programmes. In the academic year 2017/2018 and later on, the Department made amendments to study programmes that will be implemented as of the academic year 2021/2022.

1. Revision of ECTS credits (see Standard 2.5.)

The revision was carried out in accordance with the European Credit Transfer and Accumulation System, whereby one year of study with full workload generally amounts to at least 60 ECTS credits.

In the Department's Self-Evaluation Report, one ECTS credit represents 30 hours of total average student workload needed for acquiring learning outcomes.

2. Introduction of English language as an obligatory course on the 1st year of the undergraduate study programme

Based on the initiative of teachers and comments from the student satisfaction survey, English language will become an obligatory course instead of an elective one (1st and 2nd semester, 1st year of study). The Expert Panel thinks that English language should remain an elective course.

3. Introduction of new elective courses

The Expert Panel noticed that the Department offers too many elective courses, for example the undergraduate study programme in *Biology* offers 26 elective courses, the graduate study programme in *Biology* 38 courses, the graduate study programme in *Biology and Chemistry Education* 24 courses and the graduate study programme in *Nature and Environmental Protection* 26 courses (7 on the first year of study and 14+5 on the second year). The Expert Panel expresses its concern about the large number of elective courses considering that in 2019, 46 students were enrolled in the first year of the undergraduate study programme in *Biology*, 19 students enrolled to the graduate study programme in *Biology*, 8 students to the graduate study programme in *Biology and Chemistry Education* and 7 students to the graduate study programme in *Nature and Environmental Protection*, i.e. a total of 80 students out of 130 available slots. An elective course can be delivered only when a minimum of 5 students enrol in it, which means that certain elective courses were never delivered.

4. Revision of learning outcomes (see Standard 2.2.)

From 2018, the Department has successfully reviewed and implemented the learning outcomes of all courses of the undergraduate and graduate study programmes.

Field classes and field work take place in different parts of the Republic of Croatia. The Expert Panel would like to highlight the fact that field work improves the quality of all programmes and specialisations at the Department, which was also commended by students.

The Expert Panel from 2015 has included amongst other shortcomings the fact that the Strategic Programme for Scientific Research covers a too narrow scientific area and that it is not connected to modern research in the field of biology.

The undergraduate study programme in *Biology* has several shortcomings due to which the programme does not follow actual guidelines for scientific-research activity regarding modern research in the area of biology:

1. The obligatory course *Microbiology* (4 ECTS credits) carries too few ECTS credits and is introduced too soon, on the first year of study. This demanding and actual course, which requires prior knowledge in chemistry, should be taught on the third year of study and should carry more ECTS credits.
2. The obligatory course *Genetics* (4 ECTS credits) carries too few ECTS credits. The Expert Panel recommends to split this course in two courses, prokaryotic and eukaryotic genetics.
3. The course *Physical Education* (PE): this course shouldn't be an obligatory course, but part of the students' extra-curricular activities. According to the syllabus, this course is delivered throughout 4 semesters, and in each it carries 1 ECTS credit. It is not clear whether the course *Physical Education* is one or four courses.

Recommendations for improvement

The enrolment quotas exceed the number of students interested in studying at the Department as well as the needs of the labour market for professionals of that profile. The number of enrolled students is continuously lower than the number of available slots, and this is especially true for the study programmes in *Biology and Chemistry Education* and *Nature and Environmental Protection*. The Expert Panel recommends to work on the optimisation, quality improvement and the visibility and promotion of study programmes.

The trend of decreasing interest for study programmes and lower pass rates on certain study programmes indicates the need to carry out necessary changes, such as the rationalisation of study programmes, establishing cooperation with other departments or the merging of study programmes.

The Department submitted formal evidence proving that it follows recommendations and guidelines from the previous re-accreditation, but in fact it does not follow them or it follows them according to their own interpretation (see Standards 2.2. and 2.5.).

1. Revision of ECTS credits (see recommendations under Standard 2.5.)

2. Introduction of English language as an obligatory course on the first year of the undergraduate study programme: it is recommended to transfer the course English language 1 and 2 should be turned from obligatory to elective courses. The majority of

students after their primary and secondary education have enough knowledge to gradually acquire professional English language, specific for each area and therefore it can't be isolated from the profession in on one course.

3. Introduction of new elective courses: it is recommended to reduce the number of elective courses on all study programmes. Elective courses are delivered only when a minimum of 5 students enrol in it, and some of the elective courses were never delivered. Moreover, it is recommended to carry out occasional analyses of the elective courses delivered in the last few years and to abolish those that haven't been delivered.

4. Revision of learning outcomes (see Standard 2.2.): The Department should include the successfully revised learning outcomes of all courses of the undergraduate and graduate studies in the teaching process, research and all forms of practical work.

The Expert Panel recommends the continuous encouragement of all forms of student mobility in Croatia and abroad.

Due to the above-mentioned shortcomings, the undergraduate study programme in Biology does not follow actual guidelines for scientific-research activity regarding modern research in the area of biology:

1. The obligatory course *Microbiology* (4 ECTS credits) has to be transferred to the third year of study and the number of ECTS credits has to be increased.
2. The obligatory course *Genetics* (4 ECTS credits) carries too few ECTS credits. The Expert Panel recommends to increase the number of ECTS credits and to split the course in two courses: *Genetics of the prokaryote* and *Genetics of the eukaryote*.
3. The Expert Panel recommends that the obligatory course *Physical Education* should be part of students' extra-curricular activities. According to the syllabus, this course is delivered throughout 4 semesters, and in each it carries 1 ECTS credit. According to the Bologna reform, one course shouldn't be held during two semesters.

Quality grade

Satisfactory level of quality

2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.

Analysis

Based on the recommendations issued by the previous Expert Panel during the 2015 re-accreditation procedure, the Department established a Working Group for the Monitoring and Development of Study Programmes, a formal body for the implementation of improvements. In 2018 (see standard 2.1, item 4), the working group initiated a review

of learning outcomes in all study programmes. Learning outcomes are implemented in study programmes in such a way that students at lower levels of study must achieve taxonomically slightly lower levels of learning outcomes, and a slightly higher levels of outcomes at higher levels of study. Outcomes must be visible, measurable and enforceable. After reviewing the syllabus, the Expert Panel concluded that the implementation was mostly successful. Among the individual syllabi, there are still those without the prescribed evaluation of learning outcomes.

To a large extent, the undergraduate study programme *Biology* corresponds to level 6 of the CROQF (academic year 2021/2022, http://biologija.unios.hr/wp-content/uploads/studij/preddiplomski/Preddiplomski_studij_Biologija_od_ak_2021_2022.pdf). By analysing the syllabus of compulsory and elective courses, the Expert Panel found that, in 6 out of 35 compulsory courses and 6 out of 22 elective courses, there are no evaluations of specialized facts, concepts, procedures, principles and theories within the field of work and/or study (which corresponds to CROQF level 6). This was observed in the syllabi of compulsory courses: *Human Anatomy and Histology*, *Morphology of Plants with Fieldwork 1*, *English language 1*, *Geobotany*, *Morphology of Plants with Fieldwork 2*, *Fieldwork 2 - Botany*, *Fieldwork 3 – Botany*, as well as the syllabi of elective courses: *Anatomy and Morphology of Insects*, *Plant and Geographical Features of Eastern Croatia*, *Pedobiology*, *Toxicology*, *Practicum of Analytical Chemistry 1*, *Environmental Toxicology and Chemistry*.

Generally speaking, the Expert Panel found a satisfactory level of mastering cognitive and psychomotor skills among the learning outcomes. Some courses also assess independence and responsibility.

Compulsory course *English language 1* is taught for two semesters. According to the Bologna system, courses should not be taught for two semesters, which is why the Panel recommends that this course be divided into two one-semester courses.

To a large extent, the graduate university study programme *Biology* corresponds to level 7 of the CROQF (academic year 2021/2022, http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-znanstveni/Diplomski_studij_smjer_znanstveni_od_ak_2021_2022.pdf). By analysing the syllabi of compulsory and elective courses, the Expert Panel found that, in 2 out of 18 compulsory courses, there was no assessment of highly specialized knowledge in the field of work and/or study, which can be the basis for original thinking and scientific research (and which corresponds to CROQF level 7). It is worrying that assessments are not among the learning outcomes of courses *Scientific Research Practice I and II*.

Generally speaking, the Expert Panel found that learning outcomes included a mastering of cognitive and psychomotor skills. Independence and responsibility are also assessed.

To a large extent, the graduate study program *Biology and Chemistry Education* corresponds to level 7 of the CROQF (academic year 2021/2022, [http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-nastavnicki/Diplomski studij smjer nastavnicki-od ak 2021 2022.pdf](http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-nastavnicki/Diplomski_studij_smjer_nastavnicki-od_ak_2021_2022.pdf)). By analysing the syllabi of compulsory and elective courses, the Expert Panel found that, in 1 out of 25 compulsory and 3 out of 24 elective courses, there was no assessment of highly specialized knowledge in the field of work and/or study, which can be the basis for original thinking and scientific research (and which corresponds to the CROQF level 7). This was observed in the syllabi of the compulsory courses *Terrestrial Ecological Systems* and *Aquatic Ecological Systems*, and the syllabi of elective courses *Ecological Immunology* and *Vegetation Mapping*.

The Expert Panel found a satisfactory level of mastering cognitive and psychomotor skills among the learning outcomes; independence and responsibility are also assessed.

The name of one course from the list of compulsory courses does not correspond to the name of the same course in the corresponding syllabus. The list of compulsory courses gives the name of the course as the *Practicum of the Methodology of Chemistry*, and in the syllabus of that course calls it the *Practicum of the Methodology of Teaching Chemistry*.

To a large extent, graduate study programme *Nature and Environmental Protection* corresponds to level 7 of the CROQF (academic year 2021/2022, [http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-zpio/Diplomski studij ZPiO-od ak 2021 2022.pdf](http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-zpio/Diplomski_studij_ZPiO-od_ak_2021_2022.pdf)).

By analysing the syllabi of compulsory and elective courses, the Expert Panel found that, in 3 out of 13 compulsory and 2 out of 23 elective courses, there was no assessment of highly specialized knowledge in the field of work and/or study, which can be the basis for original thinking and scientific research (and which corresponds to the CROQF level 7). Learning outcomes that do not include the assessment of specialized facts, concepts, procedures, principles and theories within the field of work and/or study (corresponding to CROQF level 7) are found in the syllabi of compulsory courses: *Human Ecology*, *Research Practice*, *Nature and Environmental Impact Assessment*, and the syllabi of elective courses: *Soil Ecology* and *Vector Ecology*.

As a rule, the Expert Panel found a lot of mastering cognitive and psychomotor skills among the learning outcomes; independence and responsibility are also assessed.

The learning outcomes and competences of the Department of Biology study programmes can be compared and aligned with the key competences for lifelong learning (2006), which are also needed for the inclusion in the labour market, continuing education or other needs of the individual/society. However, the analysis of the Self-evaluation showed that students generally still do not develop them to a satisfactory degree during their studies, and they consider them important for their work. They develop those key competencies to a greater extent as alumni with shorter or longer work experience and

as teachers during their work, though they should have already developed them during their studies.

Recommendations for improvement

Expert Panel recommends the revision of learning outcomes for:

- Undergraduate study programme *Biology*, the syllabi of compulsory courses: *Human Anatomy and Histology*, *Morphology of Plants with Fieldwork 1*, *English language 1*, *Geobotany*, *Morphology of Plants with Fieldwork 2*, *Fieldwork 2 - Botany*, *Fieldwork 3 – Botany*, and the syllabi of elective courses: *Anatomy and Morphology of Insects*, *Plant and Geographical Features of Eastern Croatia*, *Pedobiology*, *Toxicology*, *Practicum of Analytical Chemistry 1*, *Environmental Toxicology and Chemistry*.
- Graduate study programme *Biology*, the syllabi of courses *Scientific Research Practice I and II*.
- Graduate study programme *Biology and Chemistry Education*, the syllabi of compulsory courses *Terrestrial Ecological Systems* and *Aquatic Ecological Systems*, and the syllabi of elective courses *Ecological Immunology* and *Vegetation Mapping*.
- Graduate study programme *Nature and Environmental Protection*, the syllabi of compulsory courses: *Human Ecology*, *Research Practice*, *Nature and Environmental Impact Assessment*, and the syllabi of elective courses *Soil Ecology and Vector Ecology*.

The Department of Biology should continue to encourage the development of key competencies.

Quality grade

Satisfactory level of quality

2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.

Analysis

The Department of Biology has successfully initiated a review of learning outcomes (see standard 2.1, item 4 and standard 2.2) of all study programmes in accordance with the objectives of the Croatian Qualifications Framework (CROQF). The Expert Panel reviewed individual examples of evidence on learning outcomes (student assessments and learning outcomes of seminar papers), and concluded that they were in line with the revised learning outcomes.

After analysing the syllabi of courses of study programmes, the Expert Panel found that all course adequately ensured constructive alignment or compatibility between course objectives and teaching activities (forms of teaching), assessment methods (monitoring

and evaluation) and the expected learning outcomes (student achievement). Teachers achieve objectives of learning outcomes through various teaching methods, such as lectures and exercises. Student learning outcomes are monitored and assessed in different ways: written, oral or final exams. The teacher monitors and evaluates lectures through records, evaluation, activity records, discussion and conversation. Lectures are graded with an appropriate grade. Also, teachers monitors and evaluates seminars by assessing the content of presentations and giving it an appropriate grade. Teachers monitors and evaluates exercises through records, participation reports, feedback, assignments, work diary, interpretation of results and colloquia, and give them appropriate grades. After lectures, exercises and seminars, teachers monitors the learning outcomes and evaluate them in written, oral and final exams and colloquia, which are given appropriate grades.

What is missing are more diverse assessment methods such as the evaluation of projects and portfolios, exercise reports, presentations and practice reports, exercise colloquia.

By analysing the syllabi, the Expert Panel noted that learning outcomes sometimes do not include the assessment of specialized facts (corresponding to level 6 or 7 of the CROQF), for which assessment is one of the ways of monitoring and evaluating. This means that the outcomes are not in line with the methods of their monitoring and assessment.

Recommendations for improvement

Introduction of various assessment methods, such as the evaluation of projects and portfolios, exercise reports, presentations and practice reports, exercise colloquia, etc.

Alignment of learning outcomes with monitoring and assessment methods.

Quality grade:

Satisfactory level of quality

2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.

Analysis

The Department of Biology partially followed recommendations and instructions from the previous, 2015 re-accreditation procedure. It thus formed the Working Group for the Monitoring and Development of Study Programmes. The Working Group, the Quality Committee and the Quality Office analyse development activities related to study programmes, and the Department Council adopts the proposed decisions on amendments to study programmes (see Standard 2.1.), which are then sent to the University Senate for further action.

The Working Group for the Monitoring and Development of Study Programmes and the Quality Committee analysed the graduate university study of *Biology and Chemistry Education* and partially linked it with the Department of Chemistry, as recommended by the Expert Panel in the 2015 reaccreditation. The Expert Panel concluded that the content is now better and more uniform.

The Department of Biology should continue to develop its collaboration with teachers of the Department of Chemistry, rather than hiring external collaborators. Since university teachers of chemistry courses that are taught as part of the Department of Biology's study programmes should be chemists by profession, the Expert Panel thinks that those study programmes should be coordinated at the level of the University.

Also, in accordance with the requirements and needs of teachers, there were minor changes and additions to the graduate study programme *Biology and Chemistry Education* in the period from 2016 to 2020. The Expert Panel noted that the Department of Biology had proposed the introduction of new electives.

There are a number of elective courses in all study programmes, such as the 26 electives in the undergraduate study of *Biology*, 38 in the graduate study of *Biology*, 24 in the graduate study *Biology and Chemistry Education*, and 26 in the graduate study of *Nature and Environmental Protection*. The Expert Panel believes that the number of elective courses is too high in relation to the number of students enrolled in the first years of undergraduate and graduate studies in 2019 (a total of 80 students enrolled in 130 potential enrolment slots). Some elective courses have never been taught as they are only taught when at least 5 students have enrolled.

At the initiative of the teacher and based on the students' comments from the student survey, English language will become a mandatory, instead of an elective course (semesters I and II on the 1st year of study). The Expert Panel thinks that English language should remain an elective, not a mandatory course.

In the period from 2016 to 2020, the Department did not propose any new study programmes, although they were envisaged in the plan. Also, there are no plans for an independent doctoral study in the field of biology, based at the Josip Juraj Strossmayer University. During this period, the Department Council approved a lifelong learning study of Pedagogical-psychological-didactic-methodological training in the field of natural science education, which is justified only if there are no similar or identical study programmes at the University.

Recommendations for improvement

Since university teachers who teach chemistry as part of the Department of Biology's study programmes should be chemists by profession, it would be good if the programmes were coordinated at the level of the University. The Expert Panel wants to emphasize the need to coordinate the graduate study programme *Biology and Chemistry Education* at the University level, not at the level of the Department of Biology.

The Expert Panel suggests conducting an analysis of the election courses that were taught in the last few years and to cancel those courses that were never carried out. The Expert Panel also recommends reducing the number of elective courses in all programmes.

The Expert Panel proposes to abandon the change that would make the English Language course compulsory, and to teach it as an elective.

Quality grade:

Minimum level of quality

2.5. The higher education institution ensures that ECTS allocation is adequate.

Analysis

One ECTS credit represents 25-30 hours of total average student load. The Josip Juraj Strossmayer University of Osijek and the Department of Biology define 1 ECTS credit as 30 hours of student work (Ordinance on Studies and Studying at the University of Osijek, Art. 49, para. 23, and the 2021 Self-evaluation, p. 32). Based on this, the Department revised the student workload.

During the analysis of individual syllabi, the Expert Panel came across data on active teaching – students' contact hours in teaching (L, S, E). The syllabi lack data on the hours of independent (individual) student work. This refers to the hours of individual student work outside of regular, active teaching (student contact hours - L, E, S).

Total obligations of full-time students can generally be up to 48 hours of student work per week, not less than 40 student work per week; out of those hours, at least 15 and at most 26 contact hours per week should be hours of active teaching (Ordinance on Studies and Studying at the University of Osijek, Art. 49, para. 23, and the 2021 Self-evaluation, p. 32). If one semester has 30 ECTS, this means 900 hours of student work. Out of 900 hours of student work, active (contact) teaching (L, E, S) mean between 225 (15 hours x 15 weeks) and 390 (26 hours x 15 weeks) hours per semester. In the study programmes, the Expert Panel detected between 255 and 510 hours of active teaching per semester. All hours above 390 exceed the prescribed number of hours of active teaching (Ordinance on Studies and Studying at the University of Osijek, Art. 49, para. 23, and the 2021 Self-evaluation, p. 32). After analysing the study programmes for the academic year 2021/2022 (<http://www.biologija.unios.hr/#>), the Expert Panel concluded that it was necessary to revise ECTS credits and contact hours at the level of semesters/academic years, and to supplement the list of compulsory and elective courses in certain study programmes.

The undergraduate study programme *Biology* (for the academic year 2021/2022, http://biologija.unios.hr/wp-content/uploads/studij/preddiplomski/Preddiplomski_studij_Biologija_od_ak_2021_2022.pdf) has too many contact hours (around 420 to 465 hours of active teaching in semesters I-V). Between 30 and 75 hours of active teaching is too much, and is the reason why students do not have enough hours for independent work.

Graduate study programme *Biology* (for the academic year 2021/2022, http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-znanstveni/Diplomski_studij_smjer_znanstveni-od_ak_2021_2022.pdf) has between 285 and 300 hours of active teaching.

Graduate study program *Biology and Chemistry Education* (for the academic year 2021/2022, http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-nastavnicki/Diplomski_studij_smjer_nastavnicki-od_ak_2021_2022.pdf) has too many contact hours of teaching (510 hours of active teaching in the 2nd semester). Students have 120 hours of active teaching too much, which is why they do not have enough time for independent work.

The graduate study program *Nature and Environmental Protection* (for the academic year 2021/2022, http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-zpio/Diplomski_studij_ZPiO-od_ak_2021_2022.pdf) has between 225 and 300 hours of active teaching. The sum of contact hours of teaching per semester is missing.

After analysing all the study programmes for the academic year 2021/2022 (<http://www.biologija.unios.hr/>), the Expert Panel has concluded that a revision of ECTS credits and contact hours at the level of the semester/academic year is needed.

Through the revision of study programmes, the Department of Biology merged *General and Inorganic Chemistry* (4 ECTS) with the *Basic Practicum of General Chemistry* (4 ECTS) into one course called *General and Inorganic Chemistry*, which carries 7 ECTS credits. The number of ECTS credits for the course *Organic Chemistry* has been reduced from 7 to 6. The fear is that these changes will not reflect the real reduction in student workload. The Expert Panel is aware of the dissatisfaction of students and external teaching associates who believe that, in some cases, the allocation of ECTS credits is not in line with the actual student workload, which is realistically much higher. Therefore, it would be necessary to further monitor and, if necessary, revise the ECTS credits assigned to individual courses.

Recommendations for improvement

The Department is recommended to revise study programmes, which would include further monitoring and revision of ECTS credits awarded to individual courses. In the syllabi of compulsory and elective courses, it is necessary to revise the hours of active (contact) teaching, and add information on the hours of independent (individual) student work.

The undergraduate study programme *Biology* (for the academic year 2021/2022, [http://biologija.unios.hr/wp-content/uploads/studij/preddiplomski/Preddiplomski studij Biologija od ak 2021 2022.pdf](http://biologija.unios.hr/wp-content/uploads/studij/preddiplomski/Preddiplomski_studij_Biologija_od_ak_2021_2022.pdf)) has too many contact hours. A revision of ECTS credits and contact hours of active teaching at the semester/academic year level is recommended.

Graduate study programme *Biology and Chemistry Education* (for the academic year 2021/2022, [http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-nastavnicki/Diplomski studij smjer nastavnicki-od ak 2021 2022.pdf](http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-nastavnicki/Diplomski_studij_smjer_nastavnicki-od_ak_2021_2022.pdf)) has too many contact hours of teaching. A revision of ECTS credits and contact hours of active teaching at the semester/academic year level is recommended.

For the graduate study programme *Nature and Environmental Protection* (for the academic year 2021/2022, [http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-zpio/Diplomski studij ZPiO-od ak 2021 2022.pdf](http://www.biologija.unios.hr/wp-content/uploads/studij/diplomski-zpio/Diplomski_studij_ZPiO-od_ak_2021_2022.pdf)) it is recommended to add the sum of contact hours of teaching per semester to the description of compulsory course.

Quality grade:

Minimum level of quality

2.6. Student practice is an integral part of study programmes (where applicable).

Analysis

Student practice is a mandatory part of all graduate university study programmes at the Department of Biology. Students can do the *Scientific-Research Practice 1 and 2* and *School Teaching Practice 1 and 2* at the Department of Biology or at various public and private sector institutions. By signing contracts and agreements, the Department ensured that students can do their internships in several external institutions (Public Health Institute of Osijek-Baranja County Osijek, Agricultural Institute Osijek, Papuk Voćin Nature Park, Hidro.Lab Ltd. for environmental testing and services in Ičići, Unikom Ltd. utility service in Osijek and BELJE JSC in Darda). *School teaching practice 1, 2 and 3* can be carried out in primary and secondary schools. The Department of Biology also offers students the opportunity to do their internship at foreign universities or in public and private companies and institutions as part of the Erasmus+, CEEPUS and IAESTE programmes. Students can find a place to do the internship themselves (e.g. within a specific project) or they can be assisted by a mentor and other employees of the Department. In general, student practice is done in the form of field work and/or working in laboratories and teaching bases.

During the practical training, students are required to complete the practice diary in which they enter records on their activities for each day spent on practical training. Upon

completion of the practice, the diary is approved by a mentor that supervised student's performance.

In all individual courses of non-pedagogical study programmes, the Expert Panel determined the connection between learning outcomes, teaching activities and professional instructions for field work, scientific-research practice, and school teaching practice. However, the connection between learning outcomes, learning and teaching activities and assessments (monitoring and grading) in different specialisations of undergraduate and graduate study programmes is incomprehensible in places. Students often do not know what is expected of them and what is assessed (methods of monitoring and grading). Sentences that should be improved (assessments) are:

- In the undergraduate study program *Biology (Field Work I, II and III - Zoology)*: "evidence of active engagement" or "completion of the field manual" and "evidence and assessment of completed tasks".
- In the graduate study program *Biology (Scientific-Research Practice I and II)*: "evidence, evaluation, diary of scientific-research practice".
- In the graduate programme *Nature and Environmental Protection (Research Practice)*: "evaluation".

The Expert Panel found that there were no clear instructions on how to go through the student practice, who can be a mentor and what the reports should look like. There is a lack of instructions on the final presentation in which all internship participants present the course of the student practice, outline the advantages and disadvantages, and suggest possible improvements.

Recommendations for improvement

The Expert Panel recommends that the Department prepare clear instructions on how to conduct the student practice, as well as the rules that students should follow during the practice. It is also recommended to define clear instructions on who can be a mentor and what the final report, which should be accompanied by a presentation, should look like.

In all individual courses of non-pedagogical study programmes, it is necessary to improve the connection between learning outcomes, learning and teaching activities and assessments with the method of monitoring and grading. It is recommended to improve the way of monitoring and grading in the syllabus of the undergraduate study programme *Biology (Field Work I, II and III - Zoology)*; "evidence of active engagement" or "completion of the field manual" and "evidence and assessment of completed tasks"), as well as in the syllabi of graduate study programme *Biology (Scientific-Research Practice I and II)*; "evidence, evaluation, diary of scientific-research practice") and the graduate programme *Nature and Environmental Protection (Research Practice)*; "evaluation") in the critical diary, field work report, research report, student practice report, portfolio, project work, student-led discussion, self-evaluation or peer evaluation, e-presentation. The Expert

Panel recommends that course holders follow a positive example of the syllabus of the *School Teaching Practice* in the study programme *Biology and Chemistry Education*.

Quality grade

Satisfactory level of quality

III. Teaching process and student support

3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.

Analysis

The Expert Panel considers the Department's website to be very informative for students. Among other things, it clearly lists the conditions for enrolment in the first year of study for future domestic and foreign students (<http://www.biologija.unios.hr/postupak-upisa/>). The highlighted information includes the requirements for taking the State Matura exam in compulsory and elective courses with a share (percentage) in the final grade, the percentage of evaluation of grades achieved during secondary education, and the conditions under which direct enrolment is achieved. Also, the information of enrolment includes a list of documents required for enrolment and the Department IBAN to which the indicated enrolment costs should be paid. Conditions for enrolment, as well as enrolment quotas, are also defined for domestic students who have completed secondary education abroad, foreign nationals, and students over the age of 25. The University of Osijek announces calls for enrolment in the next academic year, which are published on the University website. Criteria for study progression were adopted by the *Decision on the Linear Model of Studying at the Josip Juraj Strossmayer University in Osijek*. The conditions that a student must meet in order to acquire the right to enrol in a higher year of study or in a graduate study programme (min. number of ECTS credits), to repeat a year (min. number of ECTS credits) or suspend their study obligations are published in the Information Package available to students on the website (<http://www.biologija.unios.hr/wp-content/uploads/2020/11/Informacijski-paket-2020-1.pdf>), and in the Ordinance on Studies and Studying that is available on the University website (<http://www.biologija.unios.hr/wp-content/uploads/pravni-spisi/pravilnici/SJIS Pravilnik o studijima i studiranju srpanj 2015.pdf>). The same Ordinance also covers the recognition of learning in other foreign and domestic studies, on which instructions for students are also available as part of the Information Package. For example, holders of bachelor degrees in biotechnical, medical and natural sciences may enrol in the graduate study of *Biology* at the Department, provided they take differential courses (unlike students who attended undergraduate studies at the Department; annexes to the Self-evaluation 3.1.3 and 3.1.3a). The *Ordinance on the Erasmus+ Individual Mobility Programme* enables students to recognize ECTS credits earned in the mobility programme (annex 3.1.13. to the Self-evaluation). In general, an equivalence or recognition of courses for which students have earned ECTS credits is carried out on the basis of their Transcript of Grades. In the recognition of foreign higher education qualifications, the Department cooperates with the University Quality

Assurance Center (annex 3.1.14. of the Self-evaluation). Most student applications (recognition of ECTS credits, taking differential courses, freezing their student status, etc.) are decided by the Education and Students Committee (e.g. annex 3.1.12. to the Self-evaluation), while approval for funding or co-funding registration fees or travel expenses for conferences and mobility programmes is provided by the head of the Department (annex 3.4.4. to the Self-evaluation). These conditions are applied in practice and students are familiar with these study opportunities, which the Panel discovered in conversation with students. Finally, the Department website lists the contact information for the Student Office, which students can contact for enrolment information. The average grade from their secondary education correlates with the average grade of undergraduate students, e.g. in the graduate study of *Biology* for 2019, average grades are 4.24 and 4.14 (tables 3.2 and 3.3 of the Analytical Supplement to the Self-evaluation). However, in conversation with the Expert Panel, some students stated that they had difficulties in using literature in English and therefore avoided it when studying.

Recommendations for improvement

As a requirement for enrolment in the Department undergraduate studies, the current B level of the English Language from the State Matura should be raised to a higher A level. This would encourage students to use literature in English (which is a necessity in this study area), to be faster and more thorough in adopting scientific vocabulary, and be prepared to gain international experience.

Quality grade:

Satisfactory level of quality

3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.

Analysis

Based on the course syllabi available on the Department's website and interviews with the Quality Committee and students, the Expert Panel determined that the monitoring of student progress through individual courses is represented in the following forms of teaching: lectures (discussions and problem teaching), exercises, seminar papers and written and oral knowledge assessments conducted by teachers. The Quality Committee publishes a synthesis on the students' pass rates from the first to the second academic year for undergraduate and integrated studies, completion rates for individual study programmes, and dropout rates (tables 3.4 and 3.5 of the Analytical Appendix to the Self-evaluation, Appendix 3.2.2 to the Self-evaluation); the data is taken from the ISVU system, and the main factor taken into account is the number of acquired ECTS credits. Based on

the analysis of the obtained information, the Department conducted a partial revisions of study programmes (up to 20%) - new elective courses were introduced, some courses changed their content and others the schedule of delivery (semester). Changes were also made to the form of teaching and the number of ECTS credits (Appendices 2.1.1 and 2.1.1a of the Self-evaluation). According to the students, teachers provide insights and analysis of exams, but not all teachers evaluate and analyse seminars (if they included in a course as one of the planned forms of teaching). Furthermore, in the introductory lecture of each course, students are introduced to the requirements for passing a course (content) and the dates of exam and/or mid-terms. If students are not satisfied with the pass rate, it can usually be increased through consultations with teachers. Students are familiar with the tutoring system and use it (senior students are available to junior students, and Department students are available to international students). Separate enrolment criteria are defined for international students, students who have completed secondary education abroad and students over the age of 25 (published under the section Enrolment on the Department website, <http://www.biologija.unios.hr/postupak-upisa/>).

Recommendations for improvement

Monitoring student progress should be carried out through formal procedures, which would, for example, oblige teachers to assess student seminars. This should be analysed, more than it is now, by the Quality Committee, which should use this analysis to formulate proposals for the improvement of study programmes and teaching in general.

Quality grade

Satisfactory level of quality

3.3. The higher education institution ensures student-centred learning.

Analysis

At the University level, the Ordinance on Studies and Studying has been adopted. An overview of syllabi (available on the website) shows that classes are conducted in the form of lectures, exercises, seminars and fieldwork. According to students and teachers, interactive and research learning as well as critical thinking are mostly continuously encouraged by field work and exercises, while some courses also include problem-based teaching. Students singled out their experience with exercises in the form of imaginary research, which give them the opportunity to apply their knowledge to a potential situation. The Department applies collaborative learning in teaching, even during the coronavirus pandemic (Appendix 3.3.2 of the Self-evaluation). Students prepare their seminars (individually, in pairs or groups) in writing and/or present them orally with a presentation. Seminars are mostly assessed, but students sometimes do not receive

feedback for their work. Also, the students confirmed in conversation with the Panel that, in order to achieve learning outcomes, some of the teaching of certain courses is delivered at other University constituents, for example, the Animal Experimentation course includes an organized visit to the vivarium of the Faculty of Medicine. The Quality Committee creates student surveys to ask students about the quality of teaching, teachers' work, reasons for dropping out, etc. (Appendices 1.1.3, 1.1.3a and 1.1.3c of the Self-evaluation), and students can also leave their own comments. Students also take the unified university survey, which is one of the conditions for enrolment in higher years, and thus the completion of studies. In this context, the received written comments of students highlight their concerns with survey anonymity, given that they access it through their AAI electronic identities (<http://www.biologija.unios.hr/blog/2020/09/01/jedinstvena-sveucilisna-studentska-anketa-za-akademsku-2019-2020-godinu/>). During the Expert Panel's visit, the Quality Assurance Committee stated that all teachers receive their grades from students based on the unified university survey, but that only the Department head receives grades and comments for all teachers. The Expert Panel found out that the best graded teachers are rewarded, and if any of the teachers are poorly or unsatisfactorily graded, it is up to the Department head to impose possible sanctions, if they believe that the quality of the Department's work is impaired. The problem with this, as the Expert Panel learned from the interviews with students, is that students have not noticed any changes or developments resulting from their comments.

Furthermore, teachers have a practice of conducting their own surveys in order to adjust the teaching of their courses. From the interview with the deputy head for teaching and students, the Panel learned that the Department has had experience with students with disabilities / impaired motor function, who were not prevented from participating in any form of teaching (even field work). In addition, mature students can attend classes with all other students, but also have the possibility of being assigning additional possibilities for taking lectures and exercises, which they might need in order to harmonize their study and other obligations. During the visit to the Department laboratories, the Panel found that they are equipped (and also used for teaching purposes) with the basic equipment, such as PCR devices, centrifuges and spectrophotometers (Annex 4.4.2 of the Self-evaluation). Furthermore, students confirmed that all teachers were available via e-mail and/or consultations, but there were examples of irregular delivery of classes (teacher of *Quantitative Biology 1* and *Animal Physiology* courses), which makes students feel deprived of knowledge. Department teachers are mentors of projects of the Student Union and individual students (<https://www.biologija.unios.hr/studenti/projekti-studenata/>), and they publish some scientific and professional papers in cooperation with students (<https://www.biologija.unios.hr/studenti/znanstveni-radovi-studenata/>; <https://www.biologija.unios.hr/studenti/strucni-radovi-studenata/>), which is also stated on the Department's website.

Recommendations for improvement

All teachers should at least give feedback on students' seminar papers, if not evaluate them as part of the course (especially in graduate studies). After receiving the results of the unified university survey, if there are constructive, and especially multiple comments on the specific behaviour of a particular teacher in teaching or assessment, the Department head and teachers should change the existing methods or encourage their change in teaching, in a way that such changes are obvious to students. Also, the anonymity of students in taking surveys should be assured, for example by conducting a written survey. Although some teachers conduct their own surveys on student satisfaction with teaching, others be encouraged to do the same. Furthermore, since surveys of this type can be a useful sources of information, they should be standardized and conducted continuously. The Department should review its capital equipment and procure devices that are common at other universities, in Croatia and internationally, which engage in research and teaching on the same and similar topics (for example, electron microscope).

Quality grade

Satisfactory level of quality

3.4. The higher education institution ensures adequate student support.

Analysis

First-hand counselling for students is provided through a tutoring system, and the mediator between students and all services of the Department is the Student Office, which the Expert Panel learned from the feedback from students and heads of the undergraduate and graduate studies. According to the information obtained from the interviews with students and teachers, undergraduate students can bring their difficulties and needs to the heads of individual study years, who hold group meetings with students during the academic year, and are also available for individual meetings. Students said that they did not communicate enough with their student representatives (which the student representative, a member of the Quality Committee, confirmed) and that they were not sufficiently encouraged to contact the competent persons and services when faced with potential obstacles during their studies. Within this framework, some students did not know who to turn to, some act individually, and some never took any action. Although they used the mailbox for leaving anonymous questions for the Quality Office, they did not receive feedback and thus questioned the purpose of such a system. Finally, they were not satisfied with the reaction to important student issues, or rather, they did not see any progress. The students' written comments also reveal their general impression that their remarks and recommendations given through the surveys were not

taken into account. Related to this issue, the under-representation of students in the Department Council is worrying (5 out of 41 members, which is 12.2%). In order to expand the areas of interest for students, at their suggestion, new elective courses were introduced (Appendices 2.1.1 and 2.1.1a of the Self-evaluation), including the English language that will be conducted from the next academic year. By visiting the Department and talking to students, the Expert Panel found that students had access to many services provided by university units, such as psychological counselling (<http://www.unios.hr/studenti/psiholosko-savjetovaliste/>), legal counselling (<https://klinika.pravos.unios.hr/>), support for students with disabilities (<http://www.unios.hr/studenti/studenti-s-invaliditetom/podrska/>), mobility programs (Erasmus Program Coordinator present at the Department), the library and student services, and that students were familiar with them. Students expressed great satisfaction with the work of the Student Career Development Committee, through which they can find professional internships and get information about mobility programmes. Also, students confirmed their participation in the activities organized by the Student Career Development Committee (Appendix 1c of the Self-evaluation, <http://www.biologija.unios.hr/razvoj-karijera/>), but also individual contacts with the Committee members when it was needed. However, students are generally dissatisfied with the quality of services provided by other mentioned services. Specifically, students' experiences are as follows: they have to wait several weeks for psychological counselling, and some of them could not take advantage of mobility programmes even after trying for several years in a row. Many University units hold workshops for students on topics such as writing resumes and motivation letters, motivation and presentation skills (<http://www.biologija.unios.hr/razvoj-karijera/aktivnosti/radionice/odrzane-radionice/>). The Department has established the practice of rewarding students based on their success (Appendix 3.8.7 of the Self-evaluation), or written scientific work (Appendix 5.4.1 of the Self-evaluation). Support is adapted to special groups of students, such as students with disabilities (there is an Office for Students with Disabilities at the University level), the possibility of assistance (http://www.unios.hr/wp-content/uploads/2016/04/Tekst_za_UNIOS_obavijest_o_asistenciji_SSI.pdf), the use of additional learning equipment (http://www.unios.hr/wp-content/uploads/2016/04/UZSSI_Oprema_studenti.pdf) and facilitated movement through the Department (there is an elevator and access ramp, which the Panel saw during the visit to the Department), but not the availability of the library that is dislocated. As already mentioned, students with disabilities are allowed to attend classes together with all other colleagues. If they cannot attend regular classes, mature students are offered additional classes. The deputy head for teaching and students is available for questions and assistance in resolving the difficulties of all groups of students, and students' experiences are positive.

Recommendations for improvement

The communication of students with student representatives should be more strongly encouraged. For example, immediately before a session of the Department Council, student representatives should meet with students to hear their difficulties and suggestions, and should provide feedback on any outcomes of the Council session. Since the total number of members of the Department Council that is given in the Self-evaluation differs from the actual number (stated in the Department's statement), it is necessary to verify the number of students in the Department Council in order to meet the minimum 15% share of student representatives. The Quality Office should develop a mechanism for giving students feedback on their inquiries and inform them in detail about the current status of procedures resulting from the information they provided.

Quality grade

Satisfactory level of quality

3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.

Analysis

The Department provides assistance to all groups of students through its services, such as psychological counselling. Students with disabilities make oral statements on their status and needs to the deputy head for teaching and students, and submit written confirmation to the Student Office at the time of enrolment, which the Panel learned from the discussion with the heads of undergraduate and graduate studies. According to the deputy head for teaching and students, the Department has had experience with students with milder motor difficulties that did not prevent them from attending field work; they also attend all other forms of teaching with their colleagues. The University invests funds in equipment that might be necessary to help with learning and assistance (http://www.unios.hr/wp-content/uploads/2016/04/Tekst_za_UNIOS_obavijest_o_asistenciji_SSI.pdf;

http://www.unios.hr/wp-content/uploads/2016/04/UZSSI_Oprema_studenti.pdf).

Discretionary treatment of vulnerable and under-represented groups of students is facilitated by the work of data protection and information officers (<http://www.biologija.unios.hr/wp-content/uploads/pravni-spisi/odluke/odluka-sluzbenik-01062018.pdf>; <http://www.biologija.unios.hr/wp-content/uploads/pravni-spisi/informacije/imenovanje-sluzbenika.pdf>), but students were not familiar with their work.

Recommendations for improvement

If any of the students feel like a member of any of the vulnerable or underrepresented groups, they should be informed in advance about whom to contact, and in case of personal requests, their identity should be protected.

Quality grade

High level of quality

3.6. The higher education institution allows students to gain international experience.

Analysis

The Expert Panel received most of the information on the students' participation in mobility programmes through interviews with students who shared their experiences or aspirations to participate in one of the programmes. Outgoing student mobility is enabled through bilateral agreements, and an overview of all the HEIs that signed such agreements is available on the University's website (<http://www.unios.hr/suradnja/medunarodna-suradnja/bilateralna-suradnja/>). Students of the Department participate in mobility programmes CEEPUS, IAESTE and Erasmus+ (most frequent), information on which can be found on the website of the Department (<http://www.biologija.unios.hr/studenti/medunarodna-suradnja/>) and the University (<http://www.unios.hr/suradnja/medunarodna-suradnja/korisne-poveznice/>), or through the Department's mobility coordinator, who provides them with support during the application and implementation of a programme, for example in choosing a course for a study stay abroad. All calls are published on the websites of the University and the Department (<http://www.unios.hr/suradnja/medunarodna-suradnja/pozivi-i-natjecaji/>, <http://www.biologija.unios.hr/blog/2021/02/19/natjecaj-za-erasmus-ka1-mobilnost-studenata-iz-projekta-2019-2020-prvi-dodatni-natjecaj/>). In addition to the study stay, students also apply for professional practice, and make contacts with the help of teachers or independently. In such cases, the experimental part is often the basis for writing graduate theses (<http://www.biologija.unios.hr/kvaliteta/2021/03/17/predavanje-studentice-lucije-domjan-9-3-2021/>). The Education and Students Committee decides on the recognition of ECTS credits achieved through mobility programmes (or, failing that, on taking differential exams) on the basis of the Ordinance on the Erasmus+ individual mobility programme (Annex 3.1.13 of the Self-evaluation). The programmes are promoted through workshops, where students who have participated in one of the programmes share their experience with other interested students. In general, students are not satisfied with the measures for promoting foreign study programmes and are not considered sufficiently informed, but are motivated to work and perform professional practice abroad. The

Department does not collect data on student satisfaction with the Department's support for achieving mobility. Students mostly participate in outgoing mobility programmes that last more than three months (a total of 18 in the last five years, table 3.6 of the Analytical Appendix to the Self-evaluation). Also, several students have enrolled in doctoral studies abroad, and the Expert Panel had the opportunity to talk to some of them as part of the virtual part of the re-accreditation. The Department's website shows that course descriptions contain suggested, required or supplementary literature in the English language (e.g. http://biologija.unios.hr/wp-content/uploads/studij/preddiplomski/Preddiplomski_studij_Biologija.pdf).

Recommendations for improvement

The Department should organise more workshops for students in order to promote mobility calls. It should develop a system for analysing student feedback (e.g. from surveys) on exchange programmes and the Department's support for their implementation.

Quality grade

Satisfactory level of quality

3.7. The higher education institution ensures adequate study conditions for foreign students.

Analysis

As part of the incoming mobility programme, 15 foreign students have spent part of their studies at the Department in the last five academic years (table 3.6 of the Analytical Appendix to the Self-evaluation). Information on enrolment opportunities and study programmes is available in English, as the entire website can be translated into English by choosing such option on the website (<https://www.biologija.unios.hr/en/>). There are 17 undergraduate and 22 graduate courses, published on the University website (<http://www.unios.hr/en/cooperation/international-cooperation/erasmus/university-units-and-erasmus-courses-20172018/>), which can be delivered in English. However, as the Expert Panel learned from the teachers and the deputy head for teaching and students, if the number of foreign students is minimal, teaching is conducted in the form of consultations. International students attend exercises in English with all the other colleagues, which was confirmed by the students. The Erasmus and CEEPUS coordinator informs students of their rights, obligations and schedules. Student guides advise international students on studying at the Department. At the University level, students have the option of learning the Croatian language (<http://www.unios.hr/suradnja/medunarodna-suradnja/erasmus-incoming->

[students/unios-academic-information/](#)), which some international students used (Appendix 3.7.2 to the Self-evaluation). The Department does not collect data on the satisfaction of foreign students with the support of the Department in achieving mobility.

Recommendations for improvement

The Department should develop a system for analysing student feedback (e.g. survey) on exchange programmes and the Department's support in their implementation. It is necessary to strengthen international cooperation, so that it results in an increase in the number of foreign students who decide to study entirely at the Department. It is necessary to prepare an information package in English for foreign students.

Quality grade

Satisfactory level of quality

3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.

Analysis

All teachers have provided syllabi for their courses with the intended learning outcomes, which are available on the Department website (<http://www.unios.hr/suradnja/medunarodna-suradnja/erasmus-incoming-students/unios-academic-information/>). Students confirmed to the Expert Panel that exams are conducted according to the teaching calendar for the current academic year, which is adopted by the decision of the University Senate (<http://www.unios.hr/wp-content/uploads/2020/07/Nastavni-kalendar-2021.pdf>), and that in practice there are minimal changes in exam terms that are published on the Department website (<http://www.biologija.unios.hr/nastava/ispitni-rokovi-i-termini-konzultacija/>) along with the schedule of consultation hours, about which students receive timely information. According to the students, during the assessment of knowledge, teachers remain within the framework of the content that they have previously set and offered in class. From the course syllabi and student feedback, the Expert Panel concluded that the objectivity of teachers in assessments conducted at the Department is ensured through oral exams with witnesses and cumulative scoring throughout the semester. Based on the Department's experience with students from special groups, such as students with disabilities (previously mentioned), there was never a need to adjust the assessment procedures because all students were able to access the exam in the same way. From the interviews with students, the Panel learned that students mostly received feedback on the results of assessments, which includes insights into exams and their analysis, but does not apply entirely to seminars, given that in some courses they are not evaluated at all. Comparing

information from its interviews with students and the deputy head for teaching and students on the topic of teacher negligence, such as not holding the scheduled classes, the Expert Panel concluded that students complained about this through anonymous comments, but that the deputy head was not aware of such examples, and that students never publicly addressed this question to a competent person or service of the Department, which indicates insufficient mutual communication at the Department. The Department organises workshops for teachers (all teachers are invited to come), for example on the topic of learning outcomes whose aim was to align learning outcomes with the teaching and assessment methods (<http://www.biologija.unios.hr/kvaliteta/2020/07/14/radionica-o-ucenju-i-poucavanju-09-lipnja-i-8-srpnja-2020-godine/>). Another such workshop for teachers was the one on the anti-plagiarism program Turnitin.

Recommendations for improvement

All student assignments, including seminars, should be evaluated. Student comments should be more appreciated and analysed (and accordingly acted upon by the Department staff to whom the comments refer), because this is the medium through which students are most often encouraged to express their opinions. Finally, workshops for teachers should be attended by all teachers who are in a position to do so, not just those who feel they have room to develop their skills.

Quality grade

Satisfactory level of quality

3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.

Analysis

Upon the completion of their studies, students receive a transcript of grades (e.g. Annex 3.9.1 of the Self-evaluation) and a certificate on the academic title (e.g. Annex 3.9.2 of the Self-evaluation), which are valid until the issuance of the diploma, and then a diploma in the Croatian language (e.g. Annex 3.9.4 of the Self-evaluation) and a diploma supplement that is issued in accordance with the Ordinance on Studies and Studying, which the Panel confirmed by reviewing the files of graduated students in the Student Office. The same Ordinance stipulates that the Department should issue a supplementary study document in the Croatian (e.g. Annex 2.2.1 of the Self-evaluation) and English language (e.g. Annex 2.2.1a of the Self-evaluation) free of charge, with both documents being signed by the head of the Department. The costs of preparing certificates and diplomas, and of promotion are defined by the University Senate Decision on Special Fees

([http://www.biologija.unios.hr/wp-content/uploads/pravni-spisi/studenti/Odluka Senata o posebnim naknadama.pdf](http://www.biologija.unios.hr/wp-content/uploads/pravni-spisi/studenti/Odluka_Senata_o_posebnim_naknadama.pdf)).

Recommendations for improvement

No recommendation.

Quality grade

High level of quality

3.10. The higher education institution is committed to the employability of graduates.

Analysis

For each academic year, the Quality Committee at the level of the Department analyses the employability of students (Appendices 1.1.3d and 1.1.3e of the Self-evaluation). Enrolment quotas are determined according to the capacities of the Department and the interest of students in previous years, and are confirmed by the University Senate (Annex 3.1.1a of the Self-evaluation). Considering the fact that students are not sufficiently oriented towards the European market and that interest in certain study programmes is rapidly declining, the enrolment quota for undergraduate studies is inappropriately high. Students are informed about the possibilities of continuing their education or finding employment after completing their studies through the Department's website (<http://www.biologija.unios.hr/razvoj-karijera/oglas/ponuda-poslova/?fbclid=IwAR1gVdChN5AlMuipvqfTfnP-3JHMFH0hexoEqd6fcTLrevcXpT-miTfAB1w>), advertisements in the Department premises, workshops (<http://www.biologija.unios.hr/kvaliteta/2019/12/15/predstavljanje-poslodavaca-na-odjelu-za-biologiju-12-12-2019/>), through the Alumni BiolOs association (advertisements and workshops mostly advertised on social networks), which is in contact with the Department, and by participating in the Career Week (<http://www.unios.hr/kvaliteta/djelatnosti/karijera/>), which was confirmed by the students. Based on interviews with students and alumni and a review of alumni activities, the Panel determined that support for students during their studies and in finding employment is also provided by the Alumni BiolOs Association. The Association organizes a series of lectures, workshops and projects involving students, and thus prepares them for the labour market (<http://www.biologija.unios.hr/alumni-biolos/odrzana-predavanja/>, <http://www.biologija.unios.hr/alumni-biolos/odrzane-radionice/>, <http://www.biologija.unios.hr/alumni-biolos/projekt-outdoor/>). A detailed, up-to-date overview of the Association's activities is available on Facebook and Instagram. Also worth mentioning is the alumni mentor project, through which students apply for a 30-

hour internship through a call published on the Department's website (<http://www.biologija.unios.hr/blog/2021/03/11/natjecaj-for-participation-in-the-alumni-mentor-project/>). High school students can find out about employment possibilities at the University Fair and the Department's Open Day. Also, regarding the planning of future careers and finding internships during their studies, students can contact members of the Student Career Development Committee, for which purpose the Department also appointed a representative for the implementation of career guidance activities.

Recommendations for improvement

It would be good to develop mechanisms for receiving feedback from members of the Alumni BiolOs Association on their own studies (advantages and disadvantages), and on the success of students in conducting professional practice under the guidance of Alumni BiolOs. Enrolment quotas need to be revised (according to labour market needs and student interest).

Quality grade

Satisfactory level of quality

IV. Teaching and institutional capacities

4.1. The higher education institution ensures adequate teaching capacities.

Analysis

The Department of Biology has a sufficient number of employees elected to scientific-teaching grades, and the ratio of students and full-time teachers is extremely favourable (8:1). It is thus surprising that many teachers have a teaching load that exceeds the expected load by about 50%. It follows that the distribution of teaching obligations and scientific research work is inadequate, which means that teachers do not have the opportunity for adequate professional development. Such an overload should not be a feature of a university department that is focused on research excellence. This problem might be exacerbated by insufficient number of assistants, doctoral students and postdocs. Also, if we take into account that some elective courses are included in the study programmes but are not delivered due to insufficient student interest, it is possible that the real workload does not correspond to the provided data.

In terms of teaching capacity, there has been no noticeable improvement at the Department based on the Expert Panel recommendations from the previous re-accreditation procedure. Despite the recommendation to increase the number of doctoral students, the total number of junior scientific staff (assistants, doctoral students, postdocs) has almost halved.

The main complaint of the previous Expert Panel (the 2015 re-accreditation) was that the Department of Biology did not use teaching capacities of the neighbouring Department of Chemistry, which had a particularly negative effect on the graduate programme Biology and Chemistry Education. It was also emphasized that chemistry courses within the biology study programmes should be taught by teachers who were chemists. Due to the fact that the field of biology officially includes the scientific branch of molecular biology and biochemistry, as well as the fact that the boundary between molecular biology and biochemistry is blurred, and exception could be made for a molecular biologist to teach biochemistry. It is not clear from the attached documents in which branch the holder of the *Biochemistry* course was elected, but it is evident that she prepared and defended her doctorate in the field of biology / biotechnology, under the mentorship of a biologist who was elected to the scientific-teaching grade in the field of general botany. Finally, it remains questionable whether teachers with a doctorate in biology, and elected to a scientific grade in the interdisciplinary area, can be holders of the courses *General and Inorganic Chemistry*, *Organic Chemistry*, and *Basic Practicum in General Chemistry* (since these disciplines do not belong to the interdisciplinary area).

It would be expected that the course *Human Anatomy and Histology* was entrusted to a teacher from the Faculty of Medicine, which would be especially logical when it came to a study programme conducted by a university department. However, it could be accepted that the course was held by a scientist who studies birds and who was also entrusted with the course on vertebrates, but it is difficult to accept that the co-leader of both courses is an assistant professor who publishes scientific papers on mosquitoes.

Unfortunately, the problem of competencies of the holders of chemistry courses, which was pointed out by the previously Expert Panel, can now be detected in biological courses as well. Although the problem began to arise earlier, it crossed the tolerance limit with uncontrolled hiring in the years following the previous reaccreditation procedure. Although the Department invokes excellence, mass elections into the grade of assistant professor certainly did not meet this most important criterion. Perhaps it was done by redirecting the coefficients of associate grades, which are now lacking, or by getting new coefficients with the support of the University, but the elections to scientific-teaching grades were conducted in a hasty and even forced way, and the only formal requirement taken into account was a certain number of published papers. The number of examples when a person who was hired only had credits as one of the five to ten co-authors on a paper is unacceptable, especially when their contribution to published scientific papers was highly questionable. The problem becomes even greater if we count the common practice of authorship of publications that are not thematically related. The culmination of the problem is the allocation of courses to holders who do not have scientific competences for those courses.

It should be said that the Department has several “branded” scientists. These are professors in the highest grades, whose fields of activity and scientific contributions are well known to everyone in the academic circles of Croatian biology, and which we recognize as the main authors of at least some of their publications. Less recognisable is the field of activity of associate professors, although there are those among them who could become established, at least on the Croatian level. The unrecognizability of the scientific profile of assistant professors is absolutely unacceptable. Instead of making the criteria for election and promotion more demanding, the Department is now full of assistant professors who have never been first authors, which they should have been at least once, i.e. at least on one publication derived from their PhD theses. Lists of papers published by assistant professors include too many papers published in lower-ranked journals. It should also be said that the Q1 category in agronomy is not as impressive as that same category in biology or chemistry. The Department declaratively supports the professional development of its employees. However, support is not always sufficient, as some aspects –such as international experience, which is an exception and should be the rule - require a strong insistence. A good candidate for an assistant professor should have

a total of three months of study stays in respectable foreign institutions, while a one-year specialization would be an appropriate requirement for election to a higher grade. The absence of this aspect is also demonstrated by the Department's publications, which rarely recognize international cooperation. Cooperation with scientists in Croatia is more frequent, but the main authors are too often those from collaborating teams. All of the above is ultimately reflected in teacher competencies, and this partially explains why the syllabi of some courses seem anachronistic.

Recommendations for improvement

An uncompromising insistence on excellence is essential when recruiting scientific-teaching staff. This principle should also be applied to the elections to higher grades, but it is crucial to employ only excellent assistant professors.

Younger associates should be guided towards excellence through a good mentoring system, which can in no way be reduced to just meeting a certain number of publications in accordance with the minimum national criteria.

Scientific contribution, not the number of papers, should be an indicator of employee excellence.

Elections to scientific-teaching grades should be guided by the need to cover a certain branch of the profession. The choice should, therefore, be such that the chosen person's scientific opus should include teaching competencies for a certain branch of biology or chemistry.

An indispensable indicator of excellence should be international experience gained through several months of training, with active participation in the research of scientifically superior institutions.

Quality grade

Minimum level of quality

4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures, which include the evaluation of excellence.

Analysis

Right off the bat, the employment of a very large number of new teachers, in a period of only two years, raises questions about the motive for such a step. The hiring of teachers without insisting on their scientific contribution, i.e. their scientific orientation towards a

certain branch of the profession, cannot be recognized as a process of quality assurance that takes into account teaching and scientific competencies. In terms of commitment to the development and implementation of human resources management policy, the Department of Biology should not focus solely on numerical growth. The analysis of the capacities that a higher education institution needs in order to conduct study programmes should, above all, include quality and criteria of excellence in accordance with internationally recognized standards. Not all young associates (assistants, doctoral students, postdocs) should be elected as assistant professors, just as not all assistant professors must reach the grade of full professors with tenure before they retire.

Since this is a university department, the reliance on university resources should be more pronounced.

Although the Department has an Appointment and Advancement Committee (also mentioned in the Self-evaluation), the composition of which was communicated to the Panel at a meeting with the Department representatives, the Expert Panel could not make a conclusion on the practical role and functioning of this body. In any case, this formal body is not guided by any document that would prescribe additional competitive criteria for excellence, on top of the national minimum requirements.

It is uncertain whether a monetary reward for authors for publications published in a top journal is the right way to stimulate excellence. Moreover, examples of monetary rewards for "first of the authors employed by the Department" seem particularly controversial. Namely, the "real first author", who was the most engaged in the practical execution of research, and the last (main, senior) author who was the author of the concept, wrote the manuscript and defended it in correspondence with reviewers, and who is recognized in the international environment as the exponent of the research topic, do not receive any monetary stimulation. At their institution, all of the above is included in the "job description" and is understood as a condition for career advancement. The middle (secondary) author from the Department of Biology is awarded with, among other things, a monetary stimulation for his supporting role.

Recommendations for improvement

Recruitment should be conducted on the basis of criteria, not the least of which should be research excellence.

It is necessary to define additional competitive criteria, adopt an ordinance and develop appropriate methods for selecting the best candidates for elections to scientific-teaching grades.

With the election to higher grades, the difficulty of the requirements for advancement should increase in qualitative terms, so that the election to a full professor should include being the main author of papers published in renowned journals within the natural sciences (not biotechnical or technical), as well as long study stays and specializations at renowned foreign institutions.

Quality grade

Minimum level of quality

4.3. The higher education institution provides support to teachers in their professional development.

Analysis

The Department encourages the professional development of its employees. It also gives financial support for the professional development of administrative staff, and provides methodological and didactic courses that contribute to the development of teaching competencies of assistants and teachers in scientific-teaching grades. Furthermore, the Department allows its staff an unhindered leave of absence for the purpose of foreign mobility. The University International Cooperation Office provides support in the form of information on mobility opportunities and the establishment of international cooperation.

Insufficient support is noticeable in the area of scientific development and advancement of young associates, which is a consequence of the lack of clear criteria and commitment to scientific excellence. The purpose and role of doctoral and postdoctoral students is not to stay at the Department (this fate can only exceptionally befall some of them), but to continue their careers elsewhere. These young people are the engine of every university and deserve the epithet *research intensive*, and the university's obligation is solely to ensure their scientific and professional progress and develop their research skills. There is a growing saying in the European Research Area (ERA) that a good PhD study should result in good PhDs, not good dissertations. Neither of these two outcomes are present in cases where persons who have published only one or zero scientific papers as first authors are elected as assistant professors. The Department of Biology does not have a system of mentor accountability. The mentor is not obliged to keep their students at the Department, but they should be responsible for developing the skills that make students competitive in a wider and international environment.

Recommendations for improvement

As part of a general value system that strives for excellence, the Department should also build a system of mentor responsibility for the competencies and curricula of young scientists.

Quality grade

Satisfactory level of quality

4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.

Analysis

The premises of the Department of Biology are located in a historic building that was adapted for teaching and research activities in the field of biology in 2011. The building has a satisfactory number and size of lecture halls, practicums, laboratories and offices. Although there are no specialized facilities for all biological disciplines, the Department's office and laboratory furnishing and instruments generally meet the basic needs of students and the teaching-research staff. The IT infrastructure is satisfactory. The Department has only two items of capital equipment, both of which were procured fourteen years ago. The Department of Biology shares the building with the Department of Chemistry, which provides an excellent potential for cooperation in the implementation of study programmes and joint scientific and professional projects. Moreover, the position of the building within the university campus brings the Department closer to other University constituents. The biological station in Sunger represents the valuable potential of the Department.

Recommendations for improvement

Further, continuous efforts are needed to improve the Department's equipment and provide conditions for the widest possible range of teaching and scientific activities within various biological disciplines.

Quality grade

Satisfactory level of quality

4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.

Analysis

The library of the Department of Biology is in a dislocated building, in another part of the town. Its location, fundus and IT infrastructure don't provide much support to either students or the faculty. The Department tries to compensate for this problem by publishing compulsory and supplementary teaching content on its website. Furthermore, the most up-to-date textbooks and manuals are kept in teachers' offices and are always available to students. Final and graduate theses other papers are also available, and have been published in the repository of the Department of Biology since 2010.

Recommendations for improvement

Further, ongoing efforts are needed to relocate the library within the campus, to refresh its holdings with recent titles, and improve its level of computerization.

The Expert Panel also recommends modernizing the library so that it would meet modern standards of similar institutions.

Quality grade

Satisfactory level of quality

4.6. The higher education institution rationally manages its financial resources.

Analysis

The financial plans and reports of the Department of Biology, as well as other university departments, are published on the University website. According to these documents, the Department's operations are characterized by financial sustainability and a transparent, efficient and purposeful management of financial resources.

The Department generates 88% of revenues from the state budget, while the rest comes from revenues according to special regulations (6%), revenues from own activities generated through the implementation of professional projects (5%), and revenues from grants (1%) that are also related to professional activity. A sufficient share of budget funds, but also non-budget revenues, is invested in the development and improvement of teaching and scientific research. Management of non-budget revenues is regulated by the relevant Ordinance.

However, it should be noted that the University does not manage its resources rationally and does not have control over the departments as its affiliates. In this sense, the University does not have a vision nor does it seem to understand the purpose of having

university departments. In such a situation, departments are exhibiting increasingly autonomous behaviour. Teachers from one department are external associates on another department, although everyone is an employee of the same University. Each department develops its own management, administrative and teaching structure, which is not acceptable from the point of view of rational management of financial resources.

Recommendations for improvement

The Department of Biology should show greater rationality and restraint in terms of increasing the number of its research and teaching staff, as well as in terms of hiring administrative staff and expert associates.

The University needs to show responsibility in managing its constituents, and especially its departments-branches. The excuse "but we are not an integrated university" cannot justify the irrational commitment of budget funds.

Quality grade

Satisfactory level of quality

V. Scientific/artistic activity

5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.

Analysis

After the previous re-accreditation procedure, the Department of Biology has developed a Strategic Programme for Scientific Research for the period from 2017 to 2021, which includes an analysis of the advantages and disadvantages of scientific activities and defines goals and procedures for improving this activity in the future. The Strategic Programme defined specific research plans (topics), but the Self-evaluation did not provide information on how many of these topics have already been realized and what was the scientific output (number of published scientific papers) of those projects. Moreover, those research topics are very general and descriptive, without specifically defined scientific hypotheses that would be tested within those projects.

The scientific productivity of the Department of Biology is low to average, in both the number and the quality of scientific publications (the h-index in WoS is 28, and the total number of citations is 2864, table 5.1.a from the Appendix), as well as in the number of large scientific projects that are not funded from internal University funds. On average, each teacher publishes 0.88 scientific papers per year (table 5.1a from the Appendix), which is low compared to the international (European) average. There is a very large difference in the scientific output of individual teachers. It is highly commendable that some teachers publish a solid number of papers in good (Q1) journals, and that some of these papers are well cited (table 4.4 from the Appendix, *nastavnicki_radovi_reakreditacija.docx*). However, it is worrying that, in the past five years, some of the teachers have not published a single paper as the first or main (last) author in WoS-indexed journals. The list of publications (*nastavnicki_radovi_reakreditacija.docx*) also revealed that a large number of Department teachers have participated in numerous scientific papers. Such cooperation is commendable, but many co-authors are usually credited as authors in the positions between the second and penultimate; what they should do more often is take the initiative of being the first or main (last) authors, and thus develop their own direction of scientific research. While some teachers have conducted thematically well-defined and focused scientific research, some are co-authors on thematically diverse publications without a clearly defined scientific field.

It is also worrying that, out of many scientific projects, especially those funded by the University of Osijek and the Department of Biology, not a single scientific paper has been published in journals indexed in WoS (*projects and papers.xlsx*). This indicates that funds are not spent efficiently. In the last five years, the Department earned HRK 10,662,892

(EUR 1,421,719) for scientific activities, and additional HRK 5,900,468 (EUR 786,729) for professional activities (table 5.3, attached). In relation to the realised income, scientific output can be assessed as poor. It should be emphasized that the two projects with the largest amount of funding (HRK 8,408,365 and EUR 1,121,115) are still ongoing, so it is to be expected that their scientific output will be visible only in the coming years.

The Department's projects and publications show that its scientific activity is oriented towards applied biology (biotechnology, agronomy, toxicology and environmental issues), which is commendable, while scientific activity in basic biological topics (research on biodiversity, evolution, genetics, microbiology) is less pronounced or does not exist, and often does not result in scientific papers indexed in WoS. There is a good scientific output concentrated within several research groups/teams, while other groups do not achieve adequate scientific production. Also noticeable is the Department's weak scientific networking within the international framework (table 4.5 in the Appendix), while cooperation with scientific institutions within Croatia is better.

Numerous teachers have participated in the organizing committees of scientific and professional conferences (table 5.4 in the Appendix), and some are members of editorial boards of six international scientific journals indexed in WoS (table 5.5 in the Appendix). Teachers also took part in national and international scientific and professional conferences, where they presented 200 conference papers (Self-evaluation, p. 67). This is an average of 1.3 conferences per teacher (31) per year. This activity is average, but the number of scientific papers resulting from it is unsatisfactory.

Recommendations for improvement

It is necessary to increase the scientific activity of some associates and encourage the publication of research results in international journals with greater impact.

The Department should restructure its sub-departments to ensure the development of all major scientific branches in biology. Establishing appropriate scientific teams would also favour the balanced development of all biological disciplines. Many teachers are co-authors of thematically very diverse publications, which shows that they do not have their own scientific orientation. Orientation towards certain scientific issues would favour the improvement of quality, and the creation of research groups with a clear scientific focus would contribute to scientific excellence. This does not exclude the possibility of cooperation between teams that would recognize their complementariness in solving certain problems. Restructuring the sub-departments would also have a positive effect on teaching, as it would enable better connection and coordination of associates who teach courses within the same branches.

The Department should develop more effective procedures to encourage quality scientific publication. For example:

- Older and more experienced teachers, who already have a good scientific portfolio, should offer support to those with weak or non-existent scientific output.
- The deputy head for science or the heads of chairs should hold regular (monthly) meetings with their colleagues in order to review the achievements in the previous period and plan future activities.
- Organizing journal clubs, along with analysing publications and stimulating scientific thinking, would encourage research ideas among younger scientists and stimulate them to take more responsible roles in writing scientific papers.
- Within the chairs, one of the members should present a scientific manuscript each month (it can be only a part of the manuscript, e.g. and introduction and materials & methods or M&M and results), and get critical comments from their colleagues.
- It is necessary to raise the internal criteria for improvement in terms of scientific output.
- More efforts should be made to recruit quality scientific staff, and not hire people without previous scientific achievements.
- There is a need for more active involvement in national and international scientific teams (e.g. by taking advantage of international congresses for networking and cooperation agreements).
- Project applications for internal (departmental and university) projects should include a preliminary introduction to a scientific paper with clearly defined objectives and hypotheses, and an outline of the materials & methods that would demonstrate the project's potential to result in a scientific publication.
- It is recommended to encourage the best students to publish the results of their dissertation in the form of scientific articles.

Quality grade

Minimum level of quality

5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.

Analysis

The Department cooperates with the economy and the public sector at the regional level, carries out professional projects and studies with them, and conducts various environmental studies (mosquitoes, invasive species, inventarisations). The goals of these activities are defined in the Strategic Programme of Scientific Research, but the Department did not develop a more permanent system for the evaluation and monitoring of the needs of the economy and public sector, so this cooperation seems stochastic, based

on personal acquaintances or cooperation with companies of the alumni. The collaboration with the alumni is very commendable.

The cooperation with the Kopački rit Nature Park is extremely good, where scientists from the Department participate in the preparation of inventarisations and expertise related to biodiversity and the environment, as well as the monitoring of mosquitos. Scientists from the Department of Biology also carry out numerous professional projects, although this might leave them less time for scientific research. The results of professional projects are also published in professional articles. Some of the professional projects could be organized as start-up/spin-off companies, which could improve the employment of biological personnel in the region in the future.

As already mentioned (in 5.1), the participation in socially relevant applied research in the fields of agronomy, food science and biotechnology is commendable. Such research should be continued in the future, but they need to be balanced with basic biological research.

Teachers and associates of the Department are actively involved in 14 national and 8 foreign professional associations (Self-evaluation, p. 68), as well as in the organization of scientific and professional conferences. They are also actively involved in the popularization of science, especially by organizing various events, lectures and workshops for the promotion of science that are open to the general public or various interest groups.

Recommendations for improvement

Develop a system for evaluating and monitoring the needs of the economy and the public sector, and regulate professional cooperation with companies through contracts.

More teachers should be actively involved in professional / scientific associations.

Some of the larger professional projects could be channelled to start-ups.

Cooperation on projects with external partners should be continued and further developed.

Quality grade

Satisfactory level of quality

5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.

Analysis

The poor visibility of the Department in the national, and especially international context, is the result of average to poor scientific production, as analysed in point 5.1. This corresponds to a large number of departmental and university awards (44) and scientific and professional projects, but with a very small number of national and international awards and recognitions, invited lectures at national and international conferences (only 9 in five years!) and a small number of major national and international projects.

In the last five years, the Department has earned HRK 10,662,892 (or EUR 1,421,719 through 44 projects) for its scientific activities, and an additional HRK 5,900,468 (or EUR 786,729 through 28 projects) for professional activities (table 5.3 from the Appendix), which is commendable. Congratulations also go to the recipients of two major scientific projects funded by the Central Finance and Contracting Agency and the Environmental Protection and Energy Efficiency Fund, with the hope that these will result in an adequate number and level of scientific publications.

Teachers and associates were members of several (19) organizing committees of scientific conferences, and participated in the editorial boards of (7) scientific journals, which could be improved.

Recommendations for improvement

The Department should intensify its applications for large international and national projects. It would also be good to apply for smaller bilateral scientific projects in order to gain international experience and establish cooperation that could result in larger projects and joint scientific work, with the transfer of knowledge and the adoption of new, modern methods. Such cooperation would provide access to laboratories and apparatus not available at the Department/University.

Professional/scientific projects funded by the University/Department should include the obligation to publish scientific papers, and project application should include a specific publishing plan. Creating research teams with a good vision and scientific ideas could lead to large and well-designed projects funded by the Department/University, unlike the current fragmentation of funds.

More active involvement of teachers in national and international associations, increased scientific excellence and international cooperation should also increase the number of

invited lectures at scientific conferences, as well as membership in the editorial boards of international journals.

The criteria for awards should be stricter, i.e. the number of awards given by the Department to its employees should be reduced.

Quality grade

Minimum level of quality

5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.

Analysis

In the evaluated period, the Department of Biology developed the Strategic Programme of Scientific Research for the period 2017-2021, which includes an analysis of the advantages and disadvantages of the Department's scientific activities, and defined goals and procedures for future improvement of those activities. However, this strategy is very general and does not include any specific directions, nor a long-term vision of scientific research that would include different branches of biology that are represented in the curriculum and for which the Department employs teaching staff (biology is not just ecology!). As already pointed out, the reorganization of the Department would contribute to this with the creation of thematically homogeneous sub-departments.

Of the three main objectives defined in the Strategic Programme: (1) improving the quality of scientific research and (2) professional work, and (3) increasing the Department's international mobility and visibility, improvements are visible only in terms of the quality of professional work. Significantly greater efforts will be needed to improve scientific production and internationalization (details elaborated under items 5.1 and 5.3).

In terms of resources for scientific research, the Department has enough space and laboratories are relatively well equipped, but could be supplemented with more modern equipment. It has enough administrative staff, which is certainly a great advantage because such a large number of administrative staff can take over financial and administrative tasks, for example in the implementation of projects. The Strategic Programme envisaged the establishment of a Financial Fund to support project applications and implementation, but no such fund has been established (Self-evaluation, p. 71). In any case, the number of administrative and support (professional) staff represents a good potential for project applications and implementation.

The library is dislocated and poorly equipped with scientific literature. The Department of Biology does not subscribe to any scientific journals and has access only to databases and journals provided at the state level. In terms of financial resources, the Department and the University financially support scientific research (funding 19 internal projects in 2019), but it is not clear how the scientific output of these projects is evaluated. The University rewards its employees for publishing papers in Q1 journals (44 awards in 5 years). Such rewards (financial stimulation of publishing) is unusual in the international research space. In some places, publishing in really the best journals, such as Science and Nature, is rewarded, but these rewards can only be used to promote scientific activities, such as attending symposia or participating in workshops to improve one's knowledge (such as learning new methods). It would be appropriate for the Department of Biology to change its rewards system in this manner.

Recommendations for improvement

The strategy for the development of scientific activity should be made more specific (clearly define the main directions of scientific research, which would be in line with the main branches of biology and the curriculum), and its implementation should be regularly evaluated (at least twice a year). It would be highly desirable to reorganize the sub-departments and create a new structure that would reflect the major branches in biology.

Given the cost of laboratory equipment (apparatus), it would be good to connect with other University departments and faculties that use the same methods (e.g. agronomy, food technology, medical sciences, chemistry), for the purpose of its joint procurement and use.

The library needs to be modernized, with access to additional electronic scientific journals.

Ways of rewarding scientific achievements should be reconsidered: only the best papers should be awarded in a way that supports scientific activities (attendance of international workshops, membership in international scientific organizations, subscriptions to scientific journals, procurement of equipment and materials for scientific research).

Quality grade

Satisfactory level of quality

5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.

Analysis

Students are involved in scientific research projects, and have had 69 congress attendances and participated in writing 27 scientific and 2 professional papers in the period from 2016 to 2020 (Self-evaluation, p. 71). Furthermore, the Department's 2017 internal call for *Students in Science* resulted in the approval of 10 student projects, with the anticipated results being a published scientific paper or conference reports.

As part of writing their final and graduate theses, students are involved in scientific research processes in which they use the Department's laboratories and equipment. Some of these papers have been published in professional or scientific journals (Self-evaluation, p. 73). The Department also encourages students' research work in other ways (e.g. by co-organizing the International Students' GREEN Conference, Days of Young Researchers) and supports the Biology Students' Association ZOA, through which students can get involved in professional and scientific projects.

However, it is worrying that many teachers have not published any scientific publications in WoS in the field of biology within which they teach in the past 5 years. Thus, teachers who teach courses in (systematic) botany, geobotany, evolution, genetics and embryology (these are just some of the examples) do not have publications in these areas, and are mostly involved in eco-physiological, virological, ethnobotanical and/or floristic papers. The situation is similar with some other courses, which raises the question of teachers' competencies for the courses that they teach. The university is an institution that must base its teaching on scientific facts, and teachers at such an institution must actively contribute to the development of scientific discipline that they teach and pass on to younger generations. Without their own recorded (published) scientific experience in a particular field, it is not possible to integrate their research knowledge into the teaching process.

Recommendations for improvement

The most important recommendation is that teachers, especially younger ones, but also others who have not yet done so, define their own scientific activity in the fields of biology in which they teach.

It is necessary to motivate students to publish scientific papers based on issue covered in their graduate theses.

Organize more calls like the 2017 *Students in Science*.

Motivate students to get involved in scientific work at institutions outside Croatia (e.g. as part of the Erasmus internship) and enable them to use the results of this research in graduate theses.

Quality grade

Minimum level of quality

APPENDICES

1. Quality assessment summary– tables

<i>Quality grade by assessment area</i>				
<i>Assessment area</i>	Unsatisfactory level of quality	Minimum level of quality	Satisfactory level of quality	High level of quality
<i>I Internal quality assurance and the social role of the higher education institution</i>			X	
<i>II Study programmes</i>			X	
<i>III Teaching process and student support</i>			X	
<i>IV Teaching and institutional capacities</i>			X	
<i>V Scientific/artistic activity</i>		X		

<i>Quality grade by standard</i>				
<i>I. Internal quality assurance and the social role of the higher education institution</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
1.1. The higher education institution has established a functional internal quality assurance system.			X	
1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.		X		
1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.			X	
1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).				X
1.5. The higher education institution understands and encourages the development of its social role.			X	
1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.		X		

<i>Quality grade by standard</i>				
<i>II. Study programmes</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.			X	
2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.			X	
2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.			X	
2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.		X		
2.5. The higher education institution ensures that ECTS allocation is adequate.		X		
2.6. Student practice is an integral part of study programmes (where applicable).			X	

<i>Quality grade by standard</i>				
<i>III. Teaching process and student support</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.			X	
3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.			X	
3.3. The higher education institution ensures student-centred learning.			X	
3.4. The higher education institution ensures adequate student support.			X	
3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.				X
3.6. The higher education institution allows students to gain international experience.			X	
3.7. The higher education institution ensures adequate study conditions for foreign students.			X	
3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.			X	
3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.				X
3.10. The higher education institution is committed to the employability of graduates.			X	

<i>Quality grade by standard</i>				
<i>IV. Teaching and institutional capacities</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
4.1. The higher education institution ensures adequate teaching capacities.		X		
4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures, which include the evaluation of excellence.		X		
4.3. The higher education institution provides support to teachers in their professional development.			X	
4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.			X	
4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.			X	
4.6. The higher education institution rationally manages its financial resources.			X	

<i>Quality grade by standard</i>				
<i>V. Scientific/artistic activity</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.		X		
5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.			X	
5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.		X		
5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.			X	
5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.		X		

2. Protocol of the site visit

Re-accreditation of the Department of Biology of J. J. Strossmayer University of Osijek

Site visit protocol

Online training of members of the Expert Panel

	Tuesday, 23 March 2021
09:55 – 10:00	Connecting to Zoom
10:00 – 11:00	Training of members of the Expert Panel <ul style="list-style-type: none">• Introduction to ASHE• Presenting the higher education system in Croatia• The re-accreditation procedure• Standards for the evaluation of quality
11:00 – 12:30	Internal meeting of the Expert Panel - preparation for the site visit <ul style="list-style-type: none">• How to write the Final report• Preparing the Expert Panel for the site visit (discussing the Self-evaluation and additional documents)

Preliminary visit of the Expert Panel to the HEI

LOCATION: Department of Biology, Ul. cara Hadrijana 8/A, 31000 Osijek

	25 March 2021
09:45 – 10:00	Connecting to Zoom, internal meeting of the Expert Panel
10:00 – 10:30	Meeting with the Department management (Rector, Department head, deputy head and secretary)
10:30 – 11:00	Meeting with the Department management (Department head, deputy head and secretary), without the rector
11:00 – 11:15	<i>Break</i>
11:15 – 12:15	Meeting with the Committee for Advancement and Assurance of Quality in Higher Education
12:15 – 13:15	<i>Document analysis</i>
13:15 – 14:30	Tour of the Department (lecture halls, IT classrooms, library, student lounge, teachers' offices, student registrar's office), attending lectures and if possible
14:30 – 15:30	<i>Lunch</i>

15:40 – Return to Zagreb

**Virtual meeting of the Expert Panel members,
discussing impressions from the preliminary visit**

	29 March 2021
10:55 – 11:00	Connecting to Zoom
11:00 – 13:00	Meeting of Expert Panel members, discussing impressions from the preliminary visit, preparing for meetings with HEI stakeholders

First day of on-line re-accreditation

	15 April 2021
08:30 – 08:55	Connecting to Zoom, internal meeting of the Expert Panel
08:55 – 09:00	Connecting with the HEI on Zoom
09:00 – 09:45	Meeting with the Department management (Department head, deputy head and secretary)
09:45 – 10:00	<i>Internal meeting of Expert panel members</i>
10:00 – 10:30	Meeting with: <ul style="list-style-type: none"> • The president of the Committee for Advancement and Assurance of Quality in Higher Education, • ERASMUS Coordinator • ECTS Coordinator
10:30 – 10:45	<i>Break</i>
10:45 – 11:45	Meeting with students of all study programmes
11:45 – 12:45	<i>Break</i>

12:45 – 13:15	Meeting with the alumni (former students not employed at the HEI)
13:15 – 13:30	<i>Break</i>
13:30 – 14:15	Meeting with external stakeholders (representatives of professional associations, business community, employers, industry experts, organisations of civil society...) and external associates
14:15 – 14:30	<i>Break</i>
14:30 – 15:00	Additional meeting on outstanding issues - <i>if needed</i>
15:00– ...	<i>Internal meeting of Expert Panel members – discussing impressions from the first day and preparing for the second day</i>

2nd day of on-line re-accreditation

	Friday, 16 April 2021
09:00 – 09:25	Connecting to Zoom, internal meeting of the Expert Panel
09:25 – 09:30	Connecting with the HEI on Zoom
09:30 – 10:30	Meeting with full-time and cumulatively employed teachers, except those on management positions
10:30 – 10:45	<i>Break</i>
10:45 – 11:30	Meeting with the heads of the departments for undergraduate and graduate studies
11:30 – 11:45	<i>Break</i>
11:45 – 12:15	Meeting with the Deputy Head for Education and Students
12:15 – 13:15	<i>Break</i>
13:15 – 13:45	Meeting with assistants and postdoctoral researchers
13:45 – 14:00	<i>Break</i>

14:00 – 14:45	Meeting with the heads of research projects
14:45 – 15:00	<i>Break</i>
15:00 – 15:30	Meeting with the Deputy Head for Research
15:30 – 15:45	<i>Break</i>
15:45 – 16:15	Additional meeting on outstanding issues - <i>if needed</i>
16:15 – 16:45	<i>Internal meeting of the Expert Panel</i>
16:45 – 17:00	Final meeting with the HEI management (Department head, deputy head and secretary)

SUMMARY

The Department of Biology has developed a formally satisfactory system of internal quality assurance, focused on the teaching process and student support as well as monitoring the work of teachers, but not on scientific excellence. Its effectiveness is questionable in all its aspects, for example in reactions based on the results of student surveys. The biggest objection relates to the implementation of recommendations from the previous accreditation procedure, with special emphasis on the restructuring of the graduate study of *Biology and Chemistry Education*. Enrolment quotas for study programmes exceed the interest of candidates and labour market needs, which is most pronounced in the graduate study of *Nature and Environmental Protection*. The offered content should be optimized, its quality improved and additionally promoted. The contents of some courses need to be harmonized with trends in modern biology and current scientific insights. The revision of learning outcomes should include professional practice as well as fieldwork. The number of active teaching hours should be adjusted to the prescribed values and, as part of the revision of ECTS credits, the course syllabi should be supplemented with information on the number of hours of independent student work. The teaching process and student support seem to be the most positive aspect within the thematic areas of accreditation standards, and it is made even better by the informative website. Support is equally appropriate for all categories of students, and includes the Education and Students Committee, study year leaders, psychological counselling services, workshops to promote study stays and internships abroad, and the Student Career Development Committee. Improvements are possible and necessary to achieve through more specific participation of student representatives in the work of the Department Council, and more specific reactions of the Department to student comments, including the sanctioning of irregularly held classes on some courses. In terms of teaching capacity, the objections of the previous accreditation panel were not met, and some aspects have deteriorated. The number of doctoral students and other junior associates has been halved. The problem of the chemistry teachers' competencies now also applies to some biological courses. In a short time, the institution hired a large number of new assistant professors whose publications indicate minimal scientific contribution and a lack of profiling in line with a particular scientific discipline, which makes their teaching competencies minimal or unsatisfactory. Scientific productivity is low or mediocre, both in the number and quality of scientific papers and in the number of large scientific projects. With satisfactory institutional capacities and low-level, but acceptable funding, scientific work could and should be a strength of the Department. Significantly higher criteria, insistence on excellence, expectations regarding international cooperation, study stays and specializations should lead the Department towards a higher level of scientific quality. The reorganization of the sub-departments with the aim of covering all major branches of biology would also contribute. The Department is recognized by the public

for its scientific, and especially professional and educational activities focused on environmental issues. In addition to intensive cooperation with regional agricultural entities and University constituents in the biotechnical area, the Department is also expected to contribute to the development of the economy. The recommendations of the previous and current Expert Panels should encourage the further development of the Department of Biology as an established constituent of the University, focused on educating biology experts.