



**NATIONAL CENTER FOR PROFESSIONAL EDUCATION QUALITY ASSURANCE,
FOUNDATION**



EXPERT PANEL REPORT

ON PROGRAMME ACCREDITATION CARRIED OUT AT YEREVAN STATE UNIVERSITY:

Bachelor in Biology

and

Master in Genetics

YEREVAN – 2013

Foreword

The pilot programme accreditation procedure conducted at the Faculty of Biology, Yerevan State University, was made possible through the grant projects under the auspices of the World Bank and was implemented by the Ministry of Education and Science of Armenia, Project Implementation Unit. Two projects – *ARQATA* under the coordination of the Dutch-Flemish Accreditation Organisation (NVAO) and *Pilot Accreditations* under the coordination of the National Centre for Professional Education Quality Assurance, Foundation (ANQA) – have contributed to its implementation.

The current pilot is implemented as a joint procedure with expert panel members from the Netherlands, Flanders (Belgium) and Armenia.

The universities and programmes having participated in the pilots are:

- 1 Yerevan State Medical University (YSMU): institutional audit;
- 2 Bachelor and Master in General Medicine, YSMU: programme assessment;
- 3 Yerevan State University (YSU): institutional audit;
- 4 Bachelor in Biology and Master in Genetics, YSU: programme assessment.

Four panels chaired by NVAO experts performed two tasks: (1) a pilot audit at institutional level and a pilot assessment at programme level according to ANQA criteria, and (2) a peer review according to international standards as a result of the ambition of the universities to be partners in the European Higher Education Area. The ARQATA pilots on institutional and programme accreditation are meant to help Armenian stakeholders to implement an effective quality assurance system. The pilot procedures are similar to the formal accreditation procedures, but there are also differences. First of all it was meant and executed as a pilot with formative elements. For one thing the duration of the site visit was shorter (two to three days). During the site visit panel members at the same time operated as 'critical friends' in a peer review from the international perspective. In the end, the pilots will therefore result in panel reports of a partial accreditation procedure. Hence, these reports cannot be used as a basis for a formal accreditation decision.

This particular report covers the pilot programme assessment of the Bachelor in Biology and Master in Genetics at Yerevan State University. The pilot academic programme accreditation was done according to the criteria and standards for academic programme accreditation of the ANQA accreditation manual. The criteria and procedures used are approved by the Armenian Government on the 30th of June, 2011.



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1. EXECUTIVE SUMMARY

At present, the quality of the Bachelor Biology and Master Genetics programmes offered by Yerevan State University is largely sufficient but needs further improvement. The programmes meet five and six, respectively, of the seven criteria. The requirements related to Academic programme design and approval (criterion 1) is not met by the Biology programme, whereas the requirements related to Quality assurance (criterion 7) are not met by both programmes (yet). Please note that in every positive situation, improvements are possible, and that every negative situation includes some shortcomings that are perfectly understandable in the actual context.

Strengths

1. The bachelor programme Biology and the master programme Genetics comply with academic standards and are offered in a collegial, stimulating and productive atmosphere.
2. The staff is well aware of the shortcomings and the Faculty forms a good basis for improvement.
3. The staff provides for the achievement of the presently set goals. However, the panel wishes to make a distinction between the local situation and the international situation.
4. The programmes promote productive teaching and learning practices. The novel approach of learning outcomes-based education has to prove its value in the near future.
5. The Faculty ensures appropriate evaluation of the students' level of achievements against the intended learning and educational objectives and promotes academic integrity, with study guidance as a good practice.
6. The programmes promote research as an essential part of academic education. The atmosphere in the Faculty is research-minded and the staff is creatively using its limited possibilities.
7. The panel encountered a stimulating learning environment, forming a sound basis for academic education. The quality of educational provisions is gradually improving and the staff knows what to do for further development.

Weaknesses

1. Major shortcomings concern the design of the Biology programme, the absence of a specialisation in Biomedical Sciences and the limited amount of research possibilities for students in relation to the required learning outcomes.
2. The present Biology programme does not reflect the unity of the living system, including common principles and concepts. The programme is fragmented (as has been recognized in the SER and during the interviews) and it is not coherent.
3. The staff does not yet sufficiently participate at the international research front in a broad range of disciplines of biology.
4. The Faculty presently lacks an internal quality assurance system that promotes its maintenance and continuous improvement.



5. The feedback possibilities from external stakeholders are not very rich given that the labour market is not well developed.

Main recommendations

1. The Faculty should increase the possibilities for students to be directly involved in research, for example by a better cooperation with the National Academy of Sciences and other universities in Armenia including Yerevan State Medical University, to underscore the objectives of the programmes.
2. Obviously, the educational effect of the only recently revised programmes of the Faculty of Biology is not clear yet. The panel stimulates the staff to use the novel didactic approach as a valuable set of tools to improve academic education rather than as a set of bureaucratic measures. The panel advises the Faculty to involve the students in the development of this process from the very start of their studies, among others by proper guidance with regard to their duties and rights in this educational system.
3. An additional suggestion concerns a general introduction in the general concepts of Biology at the start of the first year of the bachelor programme, such as unity and variation, self-regulation and self-organization, reproduction, signaling and interactions, and evolution.
4. The panel encourages the teaching staff to share good practices in educational methods and hopes that the Faculty will be successful in acquiring more equipment for visualization and problem/research-based teaching.
5. The novel approach of learning outcomes-based education has to prove its value in the near future. The development of this approach needs a productive dialogue with the Educational-methodological department of YSU. Hopefully, staff and students of the Faculty can play a structural role in this dialogue.
6. The Faculty may like to design an introductory course on research and research methods in biology for all students early in the bachelor programme. This is the more appropriate because at present not all students have access to proper research training.
7. To improve and modernize the programmes, more efficiency and decisiveness will be required. A structural input from students will be required, and students and teachers should work together in monitoring and periodic review processes of academic programmes.

International Standards

The panel made observations related to the ambition of the YSU Biology and Genetics Programmes to be a partner in the European Higher Education Area. A number of these observations have been highlighted below, in order to function as a starting-point for discussions in the Faculty with the aim to strengthen the international position of the Faculty.

Observations

1. The ambitious learning outcomes in research can not be realized in the programmes for every student and thus, according to the Dean, an incoming student can not be promised that all learning outcomes will be reached unless the student is optimally motivated. International standards require that the programme is able to warrant the achievement of the intended learning outcomes of all its graduates.

2. Modern biology is about the unity of the living system and about common principles and concepts. The present programme does not reflect this unity. The programme is fragmented (as has been recognized in the SER and during the interviews) and it is not coherent. Rather than teaching separate aspects of life in a large number of modules, the panel advises the academic staff to seriously consider the (stepwise) organization of the programme on the basis of central themes, such as "the tree of life". Such a modernized programme has additional advantages. It will stimulate internationalization and interdisciplinary cooperation.
3. The Faculty will have noticed that in the European Higher Education Area the quality of teaching staff is also determined by the number and impact of research publications in primary peer-reviewed journals in the English language. A good international publication and citation portfolio points at recognized research experience, and this experience underlies research-based education. In various departments, the panel has noted good practices in this respect. The panel stimulates the academic staff to follow these examples, whenever possible.
4. A structural evaluation of the quality of staff members based on annual "Results and Development" talks with the head of the department or the Dean and/or a structural evaluation by external peers appears to be lacking. Such practices may also help to monitor whether the training activities for the staff have a substantial positive effect. The Faculty will profit from a more structural assessment of the quality of the academic staff, with criteria compatible with those in the European Higher Education Area.
5. YSU currently undertakes a reform process of the assessment system in order to comply with the requirements of European standards and guidelines. Please note that continuous changes in assessment practices severely hamper a proper evaluation of their effectivity.
6. To improve and modernize the programmes, more efficiency and decisiveness will be required. A structural input from students will be required, and students and teachers should work together in monitoring and periodic review processes of academic programmes. As an example, better formalization of the process will result in less variety in the structure of bachelor graduation works, in line with the formalized structure of research articles, and in a more and better specified evaluation form for the master thesis.

The chair of the expert panel and the coordinator declare that this report is made up based on the panel members' reports. The panel has analysed the report and agrees with the judgments included in the report. The panel members confirm that the evaluation was conducted in accordance with the requirements of the principle of independence.

11.09.2013թ.



Prof. Jan Kijne, chair

Varduhi Gyulazyan, secretary to the panel



2. EXPERT PANEL COMPOSITION

The external evaluation of the Biology and Genetics programmes was conducted by the following expert panel¹:

- Prof. Jan Kijne, Leiden University, The Netherlands (chair)
- Prof. Yuri Tadevosyan, Institute of Molecular Biology National Academy of Sciences (NAS), Republic of Armenia (RA)
- Prof. Gohar Mushegyan, Armenian State Pedagogical University, RA
- Prof. Gayane Vardanyan, Yerevan state medical University after M. Heratsy, RA
- Tsovinar Qechechyan, Yerevan State Linguistic University (student representative) , RA

The composition of the panel was agreed upon by the university and appointed by the decree of the ANQA Director.

The panel activities were coordinated by junior coordinator Varduhi Gyulazyan under the supervision of ANQA senior coordinator Susanna Karakhanyan (from the Armenian part) and Michèle Wera and Frank Wamelink from NVAO (from the Dutch part).

The minutes were taken by Srбуhi Janjughazyan.

The translation was provided by Lilya Chilingaryan.

All panel members and the secretary signed a statement of independence and confidentiality.

¹ Annex 1, 'The Curricula Vitae of the panel members'

3. EXPERT PANEL WORK DESCRIPTION

3.1 The application for state accreditation

The Faculty of Biology, YSU, applied for pilot programme accreditation by submitting to ANQA the application form, the copies of the license and respective appendices on February 29, 2012.

The ANQA Secretariat checked the application package against the ANQA requirements: the data presented in the application form, the appendices and the ANQA electronic questionnaire completed by the university.

According to the decision on accepting the application request made on March 26, 2012, a tripartite agreement was signed between ANQA, the Centre for Education Projects (Ministry of Education and Science PIU) and Yerevan State University.

The timetable of activities was prepared and approved, respectively.

The self-assessment implementation team, formed by the decree of the top management of the YSU undertook the self-assessment process from March 26, 2012 to April 2, 2013.

The English and Armenian versions of the self-evaluation report (SER) were submitted to ANQA on April 2, 2013.

The ANQA junior coordinator conducted a technical review against the ANQA requirements. On April 15, 2013 the SER was sent to the expert panel for desk-review. The desk review lasted from April 15, 2013 to June 15, 2013 resulting in a preliminary report, including the list of issues to be further explored during the site-visit as well as the target groups to be met.

3.2 The intake phase

On October 10, 2012 the representatives from the YSU "Biology" bachelor and "Genetics" master academic programmes participating in programme pilot accreditation attended two-day training on internal quality assurance. The training covered the understanding of the framework, starting the process of writing the self-evaluation report and actually writing it, organising the actual audit, and developing a handbook for EQA.

On December 19, 2012 the representatives of YSU and the ANQA coordinators responsible for the pilot participated in final one-day training on EQA. Feedback was given on the first draft of the self-evaluation report on programme level. A panel of NVAO staff scrutinized the draft report and commented on the outline and the text covering the first criteria of the framework. Their written comments were discussed in more detail.

From November 2012 to March 2013 NVAO offered technical assistance and guidance YSU "Biology" bachelor and "Genetics" master academic programmes in writing SER on the programme level. This technical assistance was basically offered on line with the exception of one feedback session in December 2012.

In stage 1 (December 2012) of 'Taking writing SERs to the final step', it still seemed that little had been done with the feedback given when discussing the draft SER.

In stage 2 (February 2013), YSU seemed to have taken the earlier comments on board. In general, the text was more relevant, better selected and above all, better matched with criteria and standard under review. Obviously, there was room for improvement but overall progress had been made.

Stage 3 (March 2013) showed that although the quality of the text had improved, the gap between the current state of affairs and the high ambitions of the criteria remained visible.

The ANQA coordinator followed the feedback sessions on the SER, both via mail and during the final training session in December 2012. The ANQA coordinator was also responsible for organizing the pilot following the ANQA manual, starting with the contract and the composition of the panel.

On February 13, 2013 in The Hague, the international panel members met to discuss the SER and some organisational issues concerning the site visit.

On May 10, 2013 the ANQA coordinator prepared the first panel meeting by analysing and commenting on the SER. The analysis was submitted to the panel.

On May 16, 2013, the peers met again in order to discuss the SER and the final programme for the site visit. ANQA organized several meetings with the Armenian panel members in order to discuss the SER and the issues for the site visit. The panel received the compiled list of issues and comments on May 30, 2013.

3.3 The preparatory visit

On June 10, 2013 the ANQA junior coordinator together with the senior coordinator, one of the panel members and the ANQA director paid a visit to the university to finalize the site-visit agenda².

Arrangements were made about the facilities for the visit, including the provision of simultaneous translation.

3.4 The site visit

The day prior to the actual visit to the university, all panel members convened at the Faculty of Biology. The panel members exchanged initial impressions, established a list of major issues, divided the supervision of criteria among each other, and discussed the items for the sessions with the target groups. Furthermore, the panel members discussed the evaluation framework, which culminates in a two-level evaluation scale: (1) meets the criteria, (2) does not meet the criteria.

Overall, the panel considered the critical reflection in the SER to be an honest, informative and valuable document to allow interviews with the Faculty members. However, some aspects of the document were not sufficiently precise and required further clarification during different sessions.

The expert panel visited the Faculty of Biology from June 19 to 22, 2013.

²ANNEX 2, "Agenda of the site-visit of the expert panel for pilot programme accreditation"



The site visit started with a welcome meeting, in the presence of the Rector of the university and ended with a meeting with the top level management of university and Faculty. In between, meetings were held with the dean, chair holders, teaching staff, supporting staff and students. Interview partners were selected on basis of their expertise in relevant issues.

The expert panel operated consistently with the agenda. Apart from the meetings with different target groups, during the site visit the panel conducted document review and observed the facilities³.

Major observations and advices resulting from the document review and the interviews were summarized in a preliminary report during the meeting at the end of the site visit. This report has not been discussed, in part to allow adaptations on second thought.

Overall, the expert panel managed to clarify the issues at hand during the site visit to come up with an objective evaluation.

3.5 The accreditation report

After the site visit, the junior coordinator prepared a first draft of the accreditation report in one and a half months' time, and sent it to the experts for feedback on August 1, 2013. All the panel members gave feedback and their comments were taken into consideration when finalizing the report. The accreditation report summarizes the present situation, the major findings, the advices and the assessments. The initial report was submitted to the university on September 15, 2013. A feedback session via Skype was organised on 26 September 2013 with the chair. The session allowed YSU to ask for clarification about issues raised in the reports that needed further elaboration.

Comments of YSU were received on 16.10.2013 and the final version of the report was endorsed by the panel on 18.10.2013. The final report was sent to the university on 22.10.2013.

³ ANNEX 3, "Resources reviewed by the panel"



4. BRIEF INFORMATION ON THE FACULTY OF BIOLOGY, YEREVAN STATE UNIVERSITY

4.1 THE FACULTY OF BIOLOGY

The Faculty of Biology, Yerevan State University (YSU), has been established in 1933. Currently, the Faculty is the main educational centre in Armenia to train high-quality specialists in various fields of Biology. At present, the Faculty consists of the following eight departments: (1) Botany, (2) Zoology, (3) Human and Animal Physiology, (4) Ecology and Nature Protection, (5) Microbiology and Biotechnology of Plants and Microorganisms, (6) Genetics and Cytology, (7) Biochemistry and (8) Biophysics.

Main directions of scientific research at the Faculty relate to the fields of molecular and cell biology, molecular biophysics, biophysics of membranes, comparative and evolutionary biochemistry, plant biochemistry, botany and mycology, microbiology, plant biotechnology, human molecular genetics and cell genetics, botany and histology, physiology of human and animal higher nervous functioning, psychophysiology, ecology of biogenesis, study and conservation of biodiversity and different aspects of nature protection.

Each department consists of research groups. These groups are incorporated into five research laboratories: General Biology, Biochemistry of Nitrogen-containing Compounds, Fungi Biology and Biotechnology, Biophysics of Subcellular Structures, and the Laboratory of Structural Biophysics (in cooperation with the Faculty of Physics of YSU). The laboratories are funded by the state and by international projects.

The self-evaluation report (SER) states that the Faculty is adequately and professionally staffed: two academicians and three associate members of the National Academy of Sciences of Armenia, 27 Doctors of Sciences and more than 100 PhDs. Together, the staff of the research laboratories consists of more than 100 people. In this respect, the faculty has a leading position among the 18 faculties of YSU.

The main building of the Faculty is located at the YSU campus in Yerevan, close to the facilities of other departments of sciences.

4.2 Education

At the Faculty of Biology, a three-level educational cycle is currently carried out: bachelor's level (4-year study), master's level (2-year study) and post-graduate level (3 or 4 years of study depending on the form of the study, present courses or correspondence courses). In general, this educational cycle is being implemented for four specialties namely Biology, Biochemistry, Biophysics and Bioinformatics.

The Faculty offers one bachelor-degree programme, Biology (240 EC), and eleven master-degree programmes: Botany, Zoology, Genetics, Human and Animal Physiology, Biotechnology, Ecology, Food Biology, Biochemistry, Medical Biochemistry, Biophysics, and Bioinformatics (each 120 EC). The Biology programme serves as a broad introduction to each of these master programmes. The programmes in Biology and Genetics are the subjects of this report.

At present there are more than five hundred students at the Faculty, among which four hundred are bachelor students and hundred are master students (including thirteen students of Genetics). The



total number of post-graduate students is thirty. Starting from the academic year 2007/08, there is a group of twenty five students of the first year of study for Bachelor's degree on correspondence.

At the Bachelors level, experimentation by the students can be trained in research laboratories at various departments of the Faculty and at the "Marmarik" student camp in the Kotayk region of Armenia.

Applicants to the bachelor programme of the Faculty should pass the first entrance examination on Biology for three specialties while the second examination for these specialties (Biology, Biochemistry and Biophysics) is facultative – either Physics or Chemistry. For the fourth specialty of Bioinformatics the applicant may choose two exams between Biology, Physics and Mathematics. Applicants for the master programme in Genetics must have a Bachelor's diploma in any natural science specialization and appropriate knowledge of biology, with the admission to be conducted through an interview.



5.1. CRITERION 1. ACADEMIC PROGRAMME DESIGN AND APPROVAL

The program is in concord with the Armenian National Qualifications Framework (ANQF), national qualifications descriptors, and state academic standards as well as is in line with the institution's mission.

5.1.1.-Goals and objectives

YSU aims at offering its students "educational programmes ensuring broad knowledge and skills, based on advanced research, creative work and innovation". The educational programmes of the Faculty of Biology comply with this ambition. The Biology programme is broad and covers most aspects of the living system, whereas the Genetics programme covers the major fundamental and applied aspects of Genetics. Theoretical and experimental education is increasingly supplemented by research activities during the course of the study. The educational objectives of both programmes are internationally recognized. The staff is motivated and increasingly successful in engagement in international cooperation. Funding and equipment obtained in international projects is directly available for innovative education.

However, the panel observed that the possibilities for students to be directly involved in research are limited and can be improved. The Faculty should increase these possibilities, for example by a better cooperation with the National Academy of Sciences and other universities in Armenia including Yerevan State Medical University, to underscore the objectives of the programmes.

5.1.2. Planning and allocation

The Faculty of Biology forms part of the regular planning and allocation system of YSU. The YSU development strategic plan determines distribution of human, educational and technical resources. By the end of each academic year YSU plans the admission quantity for all full –time and part-time academic programmes at the Faculty of Biology for bachelor, master and post-graduate levels based on the analysis of admission rates of previous years. Thus, YSU plans the admission by learning modes, degrees and specializations taking into consideration the foreseeable demand in specializations and required recourses for their implementation, including the teaching staff, technical and financial resources. The required financial resources necessary to provide the infrastructural facilities are calculated and allocated for each year to ensure proper implementation of the academic programmes.

During the meeting with the YSU Rector, deans and heads of the chairs, the panel was informed that the demand for biology specialists is large, that students actively take part in thematic and base financed projects in research laboratories and that grants are spent on obtaining new equipment and techniques. On the other hand, the panel noted that graduates have serious difficulties in finding jobs. The problem of employment is very actual in Armenia, not only for graduates of the Faculty of Biology of YSU, but also of other faculties and universities.

The amount of research money in YSU is limited and financial allocation does not keep up with the rapid developments in modern biology ("One biologist costs 40 economists"). Obviously, the panel



appreciates the efforts of the Faculty to stepwise improve the infrastructure of laboratories and to modernize expensive equipment, for example by attraction of external funding by the President and matching by YSU. During a well-organized tour through the main building of the Faculty, the panel has observed several successful results of these efforts.

5.1.3. and 5.1.4 Academic programme and learning outcomes

The Faculty is working hard to enter the European Higher Education Area. The bachelor-master structure has been implemented, the European Credit Transfer System has been introduced, the learning outcomes match the Dublin descriptors, and the master programmes, including Genetics, have been restructured into a modular form. This all fits in the policy of YSU.

Since the academic year 2011/12, the programmes Biology and Genetics have been revised and designed according to competence-based learning outcomes. Programme goals and learning outcomes have been defined (expressed in knowledge, skills and competences, in accordance with the European Diploma supplement format) and corresponding teaching and learning methods have been selected. As a result, a curriculum map was developed for each educational programme, in which curriculum content and learning outcomes have been linked. In addition to the State Educational Standards and Higher Education Qualifications of RA, other programme guidelines have been used as an inspiration, such as the European Qualifications Framework for Lifelong Learning and two recent pilot programmes developed at the Faculty of Biology, the master programme in Applied Biosciences (in the framework of the TEMPUS programme) and the bachelor programme Bioinformatics (in the framework of the Open Society Foundations-Armenia project).

The Faculty plans to evaluate the efficiency of the implemented activities through surveys among employers, already conducted surveys of graduates' satisfaction from their education, as well as through the assessment of the achieved learning outcomes during the graduation exams. When asked whether the learning outcomes are guidelines or prerequisites for a good assessment result, the Dean explicitly answered that the learning outcomes are used as guidelines. The panel invites the Dean to discuss this matter in detail with the staff in order to produce a transparent and unequivocal assessment system. This also relates to the fact that the ambitious learning outcomes in research can not be realized in the programmes for every student and that, according to the Dean, an incoming student cannot be promised that all learning outcomes will be reached unless the student is optimally motivated. International standards require that the programme is able to warrant the achievement of the intended learning outcomes of all its graduates.

According to the SER, the Faculty is well aware of the fact that the academic staff needs additional training to successfully develop and implement learning-outcomes-and- competence-based education. This need has also been recognized by YSU, and the panel welcomes the willingness of the Faculty staff to fully profit from the open days, seminars courses organized by YSU in the area of academic didactics. The staff is well aware of the shortcomings and has ideas about solutions.

Obviously, the educational effect of the only recently revised programmes of the Faculty of Biology is not clear yet. The panel stimulates the staff to use the novel didactic approach as a valuable set of tools to improve academic education rather than as a set of bureaucratic measures. The panel advises the Faculty to involve the students in the development of this process from the very start of their studies, among others by proper guidance with regard to their duties and rights in this educational system



5.1.5. Programme design

The improvement of the bachelor programme Biology and the master programme Genetics was inspired by a number of factors such as collaboration with a number of European universities, study of similar programs and reference points, and the exchange of experiences in joint projects. The panel got a good picture of the activities during the interviews with heads of the chairs and with students who were doing research at the laboratories during the expert site-visit.

As already mentioned earlier, the Biology programme is broad and covers most aspects of the living system, whereas the Genetics programme covers the major fundamental and applied aspects of Genetics. The panel has noticed that the improvement of the Biology programme mainly concerned the educational process rather than its contents. Modern biology is about the unity of the living system and about common principles and concepts. The present programme does not reflect this unity. The programme is fragmented (as has been recognized in the SER and during the interviews) and it is not coherent. Rather than teaching separate aspects of life in a large number of modules, the panel advises the academic staff to seriously consider the (stepwise) organization of the programme on the basis of central themes, such as "the tree of life". Such a modernized programme has additional advantages. It will stimulate internationalization and interdisciplinary cooperation. And by structurally including students in the design of the programme, the staff can provide them with a valuable educational experience. It may well be possible that a "unified" programme in Biology has stimulating consequences for the structure of the Faculty. An additional suggestion concerns a general introduction in the general concepts of Biology at the start of the first year of the bachelor programme, such as unity and variation, self-regulation and self-organization, reproduction, signaling and interactions, and evolution.

A second notion, which regards both programmes Biology and Genetics, is the conspicuous absence of a specialization in Biomedical Sciences (despite the cooperation in medical biochemistry and the development of clinical mycology). This is the fastest growing area in Biology and especially in this area a growing number of biology graduates find a job. In many countries, the medical centers welcome biologists to join in biomedical research. Absence of such a specialization, to start within the bachelor programme, limits the developmental possibilities of biology students and hinders employability and internationalization. In this respect, the panel sadly noted that students of the Faculty have to work in all kinds of jobs to get enough money to fund additional education to qualify for entering the medical area. In this context, inclusion of some theoretical medicine subjects, such as clinical biochemistry, pathological physiology, etc. in the educational programme can promote achievement of success in this field. The panel learned that this situation is caused by a local gap between the medical and the biological worlds and invites YSU to stimulate a dialogue between the Ministries of Health and of Education and Science to remove this outdated and unproductive barrier.

5.1.6. Requirements of students and stakeholders

In line with YSU guidelines, the Faculty of Biology uses student surveys as well as graduate satisfaction surveys to evaluate the quality of teaching. The Student Council functions in the proper way. Student surveys are conducted every six months and the results are discussed by the Faculty Dean's Office and the department heads. According to the SER, the results of such surveys suggest that the selected learning outcomes generally satisfy the students' requirements (4 or more on a 5-point evaluation scale). Unfortunately, the panel has not been able to check these data during the site-visit, despite requests. Data on the evolution of these surveys and on their analysis are lacking.



The SER states that in the future survey questionnaires on the academic programme structure and content, balance of lectures and practical laboratory classes and other issues are planned to be developed and implemented. A deadline has not been presented. During the meeting it turned out that regularly class recordings by the heads of the chairs are conducted, as well as anonymous surveys among students after which discussions are organized to reveal shortcomings and to define improvements.

Competences of individual graduates and employer satisfaction are regularly discussed with the main employers-stakeholders in the Faculty. However, these discussions are not documented and do not have a structural nature. As a consequence, the panel could not recognize a specific influence of the requirements of external stakeholders in the programmes. The Faculty is aware of this problem and will address it in the process of revision of the survey system. A systematic analysis of the needs of external partners such as schools may result in an appropriate adaptation of the learning outcomes. In this respect, the Faculty may consider to include an additional chapter in a bachelor thesis in which the student discusses how the results of the bachelor work can be adopted for use in teaching and secondary education. Good teachers from the Faculty of Biology will yield pupils with a better preparation for the study in Biology and as such they form the real basis of academic education. The panel stresses that the practice of inclusion of teacher training in the bachelor programme contrasts favourably with the situation elsewhere in Europe.

It should be mentioned that the feedback possibilities from external stakeholders are not very rich and that the labour market is not well developed. Present collaborations with, for example, the food industry are immediately linked to education and lead to a better definition of learning outcomes.

5.1.7. Quality control

The Faculty of Biology has a collegial atmosphere in which many educational matters including programme quality are frequently and informally discussed. The staff values this atmosphere as a good alternative for the absence of formal structures. Nonetheless, the educational programmes are regularly discussed in the sessions of the Educational-methodological council of the Faculty, resulting in improvements with regard to the logical succession of courses and modules, updates in course content and literature and the distribution of student workload. Recently, a Quality Assurance Committee has been formed in the Faculty in anticipation on the stimulation of the quality culture in YSU. This committee will deal with the Procedure of Monitoring and Periodic Review of YSU Study programmes, in order to implement procedures to ensure quality assurance and continuous improvement in compliance with labour market requirements and social demand, subjected to mandatory annual monitoring and periodic review. These activities have started in the academic year 2012/2013. Finally, the panel appreciates the application of the Faculty of Biology for programme accreditation as good evidence for its quality culture. Taking into consideration that the staff is well aware of the shortcomings and has ideas about solutions, the problems can be solved. Moreover, the collegial, professional and stimulating atmosphere in the Faculty will contribute to this process.

In short, the bachelor programme Biology and the master programme Genetics the Faculty of Biology comply with academic standards and are offered in a collegial, stimulating and productive atmosphere. The staff is well aware of the shortcomings and the Faculty forms a good basis for improvement. Major shortcomings concern the design of the Biology programme, the absence of a specialisation in Biomedical Sciences and the limited amount of research possibilities for students, in



relation to the required learning outcomes. Given the constraints of the judgment system of choice ("yes or no"), the panel arrived at the following judgment.

5.1.8 JUDGMENT

- The Bachelor programme Biology does not meet the requirements of the criterion
- The Master programme Genetics meets the requirements of the criterion.



5.2. CRITERION 2. TEACHING STAFF

A high quality staff provides for the achievement of the setgoals for the academicprogramme.

5.2.1. Qualified staff

During the start session, the Rector of YSU motivated the application of the Faculty of Biology for programme accreditation by pointing at her research tradition in education and the quality of the staff. The academic staff (see also Chapter 3) consists of skilled specialists including twenty four lecturers holding the title of Professor and thirty five Assistant-professors. The student-staff ratio is about six, which compares favourably to the situation in the European Higher Education Area. The staff comprises a mixture of old and young scientists. The SER contained a comprehensive list of staff members and their qualifications. The panel found it helpful that names, expertise and activities of the academic staff members of the Faculty are also available at the English website of YSU. Major specialities required for offering broad programmes in Biology and Genetics are covered.

Of the eight departments of the Faculty, six are involved in teaching within the bachelor programme Biology. The majority of these staff members is included in the research laboratory "General Biology". The master programme Genetics is primarily staffed by the department of Genetics and Cytology. The stability of human resources for teaching is secured by "The workload calculation for YSU teaching staff". Furthermore, YSU possesses a normative base for the establishment of the workload of the supporting staff.

The majority of the teaching staff is trained both abroad and in the university within the framework of educational scientific programme by the department of Additional Post-graduate Education (see 4.2.2).

There is a distinct policy of teaching staff recruitment at the university based on the competitive procedures stated in the YSU Charter. In all these affairs, the Faculty follows YSU rules and practices. It should be noted that the order on "Competitive selection and appointment of YSU teaching staff" has recently been revised.

The Faculty will have noticed that in the European Higher Education Area the quality of teaching staff is also determined by the number and impact of research publications in primary peer-reviewed journals in the English language. A good international publication and citation portfolio points at recognized research experience, and this experience underlies research-based education. In various departments, the panel has noted good practices in this respect. The panel stimulates the academic staff to follow these examples, whenever possible. It will enlarge the attraction of the Faculty for students (Armenian and foreign) and for funding agencies. The Faculty should note as well that the preferred academic degree for university teachers in the European Higher Education Area is the PhD degree, as a proof of research experience and scientific independence.

Furthermore, the panel hopes that modernization of the Biology programme will enhance the recruitment of young scientists whose expertise and attitude support the new developments in the Faculty.



5.2.2 and 5.2.3 Staff evaluation, development and promotion

Evaluation of the quality of staff members takes place after expiration of a contract term and in the process of staff recruitment for vacancies. Furthermore, since September 2011, YSU adopts an educational programme on professors qualification improvement in which teaching staff evaluation is carried out. The Department of Additional Post-graduate Education of the university is responsible for the activities, under supervision of the YSU Scientific Council. The programme has thirty-credit content with two structural parts, scientific and educational. Appropriate trainings are organized to enhance teachers' knowledge in computer science, English, pedagogy and psychology. Twenty professors of the Faculty have applied for participation in the programme. During the meetings it turned out that some of the teachers have already taken their exams and were waiting for the results. However, in the SER the Faculty states that especially the methodological component of these trainings is not effective enough and she takes steps to correct them. Nonetheless, during the interviews the teachers said to welcome the programme, being primarily interested in modern teaching methods and in sharing good practices.

Additional quality improvement activities include lectures organized by the heads of the departments and by experienced lecturers, and student satisfaction surveys. These anonymous surveys among students, applied in YSU for already ten years, promotes the professional development of the teachers, as students freely evaluate and criticise the activity of the teachers. However, as stated in the SER, results of these surveys can be used more effectively. Class recordings of the head of the departments and of experienced teachers also foster the enhancement of the quality of the teaching staff but the panel did not find available data about these, such as protocols and notes.

The Faculty asserts that the courses and pedagogical practice in the bachelor programme as well as the scientific-pedagogical practice in the master programme promote the formation and development of pedagogical skills among the graduates which in turn fosters the accomplishment of the teaching staff. The changes periodically implemented in the courses of academic programmes and the participation of staff members of the Faculty in international grant projects also promote the professional development of the teaching staff. Unfortunately, the profits of international collaboration are limited due to financial constraints and, in part, to a lack of proficiency in English.

A structural evaluation of the quality of staff members based on annual "Results and Development" talks with the head of the department or the Dean and/or a structural evaluation by external peers appears to be lacking. Such practices may also help to monitor whether the training activities for the staff have a substantial positive effect. The Faculty will profit from a more structural assessment of the quality of the academic staff, with criteria compatible with those in the European Higher Education Area.

5.2.4 Sustainable programme

Sustainability of teaching staff involvement in education is ensured by a number of measures, such as the mid long term of job contracts, invitation of guest teachers and teachers working on an hourly-pay basis and the quality of the academic staff which enables replacement of temporarily-absent professors. In this respect, the favourable student-staff ratio is helpful as well. The panel noted that, in spite of insufficient conditions, teachers with their own initiative and with the help of the Faculty



implement the academic programme with stability. Academic freedom of teachers fits well into the requirements of a coherent quality programme.

In short, the staff provides for the achievement of the presently set goals. However, the panel wishes to make a distinction between the local situation and the international situation. The staff does not yet sufficiently participate at the international research front in a broad range of disciplines of biology. Since, according to the vision of YSU, in the near future "international competitiveness is a benchmark for all its activities" (YSU Strategic Plan, p. 9), an effort has to make in this respect. This may well go hand in hand with an update of the curricula. The panel arrived at the following judgment.

JUDGMENT

5.2.5 Both the Bachelor programme Biology and the Master programme Genetics meet the requirements of the criterion.



5.3. CRITERION 3. TEACHING AND LEARNING PRACTICES

The programme promotes productive teaching and learning practices based on the evidence of student learning outcomes as well as provides for the faculty effectiveness in achieving its educational objectives.

5.3.1. Teaching and learning approaches

The teaching and learning methods used in the bachelor programme Biology and the master programme Genetics have been described in the SER, with examples of their use. They include different types of lectures (passive and active/problem-based), seminars, practical and laboratory works, educational, pedagogical practices/trainings and internships, debates, collective thinking activities and fieldwork. Modern additions are online learning and advanced DNA-work. A good practice is the on-line course in Ecology in the programme Applied Biosciences. In addition, the Faculty envisages the use of lectures containing planned-in-advance errors. The SER shows a notable shift in the past years from classical lectures to problem-based lectures and lecture-visualization. Obviously, the staff is flexible in its use of teaching methods, with the Educational-methodological council as a coordinating committee. As the meeting with the teaching staff showed, the teachers change their methods in accordance with the teaching materials and their contents. Where ever possible, the staff uses international collaborations and visits abroad as an inspiration for improvement of teaching. The meeting with the students of both programmes showed that the students mainly prefer the method of visualization which, however, is not used in all subjects. The master students Genetics liked their participation in scientific work, including the production of posters and movie shows, the presentations, the study of articles and the possibility to contribute to scientific publications.

The panel encourages the teaching staff to share good practices in educational methods and hopes that the Faculty will be successful in acquiring more equipment for visualization and problem/research-based teaching.

5.3.2. Progressive approaches in education

The bachelor programme Biology and the master programme Genetics are carried out taking into consideration traditions and experience of the Faculty as well as good teaching practices and approaches used on institutional level and in many other educational institutions. The Educational-methodological council of the Faculty takes care of a progressive vertical structure of the programmes. International inspiration comes, for example, from the TEMPUS European Master's Programme on higher education development, from staff visits of foreign universities, participation in international methodological conferences and participation in international scientific symposia. These experiences are regularly discussed at the departments and in the Faculty Research Council. Unfortunately, the profits from international input are limited due to a lack of financial resources. The panel noted that the collegial atmosphere in the Faculty supports the sharing of novel



experiences. Furthermore, the panel was happy to read in the SER that the Fulbright programme enables now a guest lectureship at the Faculty of two-four months for a number of leading professors from different universities.

5.3.3. Quality evaluation

The main set mechanisms for assessment and improvement of teaching and learning processes in the Faculty of Biology are (i) student surveys, (ii) class observations, and (iii) lecturer's professional training, to which great attention is paid in the Faculty. As the experts' site-visit showed, teachers are satisfied with students' works. However, the Faculty is well aware of the fact that these mechanisms need improvement. Student surveys need to be updated in the light of learning-outcome based education and with regard to the assessment of the effectiveness of teaching and learning methods. Class observations need more consideration, and the methodology part of teacher's training is unsatisfactory. Since the Faculty knows what can be improved and how it should be improved, the panel has full trust in the appropriate adaptation of the mechanisms evaluating the quality of teaching and learning approaches.

In short, the programmes promote productive teaching and learning practices. The novel approach of learning outcomes-based education has to prove its value in the near future. The development of this approach needs a productive dialogue with the Educational-methodological department of YSU. Hopefully, staff and students of the Faculty can play a structural role in this dialogue. In view of the positive attitude of staff and students towards the improvement of education, the panel arrived at the following judgment.

5.3.4 JUDGMENT

Both the Bachelor programme Biology and the Master programme Genetics meet the requirements of the criterion.



5.4. CRITERION 4. STUDENT ASSESSMENT

The institution ensures impartial and consistent evaluation of students' level of achievement against the intended learning and educational objectives and promotes academic integrity.

5.4.1, 5.4.3 Assessment and improvement

The Faculty of Biology applies the most recent version of the repeatedly revised assessment system of YSU. According to this procedure, the final rating of bachelor and master students is formed by a number of component assessments such as attendance, two midterm test results, results of subtasks and the final examination of the module. The specificity of learning outcomes of the bachelor programme Biology and the master programme Genetics determine assessment of additional requirements of knowledge, including the use of different research methods in the laboratory and other specific practical skills. Evaluation criteria and forms are available for teaching staff and students. The information on efficiency and objectivity of the current assessment system of students is obtained by students and alumni's feedbacks from surveys. The Educational-methodological council discusses and evaluates the compatibility of assessment criteria and learning outcomes of a given module which automatically shares good practice and knowledge among teachers. In general, the students are satisfied with the assessment system. Most students prefer oral exams "because you can fully express yourself", others feel more comfortable with multiple choice exams. It is not clear how the mechanism of feedback from alumni works.

YSU currently undertakes a reform process of the assessment system in order to comply with the requirements of European standards and guidelines.

5.4.2. Assessment transparency

Students are provided with a Study Guideline and Course Catalogue containing module descriptors and detailed knowledge about the assessment procedure and criteria. General criteria for the assessment of bachelor's graduation and master thesis works are the novelty, the quality of presentation and formulation, and the level of independency of the student. The Educational-methodological council of the Faculty is developing internal "sub-standards" for comprehensive assessment of graduation papers and thesis works, to implement in the coming academic year.

The panel was enabled to review a selection of bachelor's graduation papers and master's theses. Given the request for a cross-section of results, the marks for these works were found to be unrealistically high. During the interviews, it became clear that the Faculty was under the impression to have to select good practices. The panel was reassured by the demonstration of marking averages of student works.



5.4.4., 5.4.5. Student guidance and integrity

Study guidance is a strong element in the Faculty of Biology with highly motivated curators (all teachers of the Faculty), teaching staff with a positive attitude towards students' needs, and consequently a low number of drop outs caused by poor academic performance (although physics and mathematics cause problems bachelor programme Biology). The personal connection between the curators and the Educational-methodological council guarantees a direct link between students and educational policies. Curators meet regularly with the Dean's office. This is relevant because the Dean's office keeps files of all students with information on background, specific needs and achievements.

Most guidance work has to be done for first-year students, which is reflected in regular meetings of the Student Council with first-year students. The panel notes that these students will profit from more attention paid to an effective introduction into the assessment system.

During the interviews, an important issue concerned the motivation of biology students. The SER signals a low motivation, due to the problems on the labour market. The biology students disagreed strongly and pointed out that only a low percentage of the students have motivation problems.

The surveys for students held within the frames of TEMPUS programme "Development and Integration of University Self-Assessment Systems" have shown that the students and teachers/lecturers find the appeal system imperfect and have evaluated it 3.44 and 3.8 in 5 point assessment scale. The Faculty recognized this problem in the SER and points at the "Student Assessment Guide" developed by YSU in 2012, to be implemented in the coming academic year.

To maintain academic honesty and to struggle against plagiarism in the assessment system, the written exams of the bachelor programme Biology and the master programme Genetics are held in stamped special copy-books, oral examinations and re-examinations are held by board of examiners and the final examinations are being audio and video recorded. When asked, the biology students were well aware of the instruments to fight plagiarism but noted that every student knows some examples. In contrast, the master students did not observe plagiarism ("We have oral exams. How is it possible to cheat?"). Since plagiarism is a general university problem, the panel encourages the Faculty to cooperate within YSU for the exploration of the use of specific anti-plagiarism software.

An interesting innovation in 2012 is the creation and further development of a student international electronic journal of "Applied Biology/Biosciences" (in the framework of the TEMPUS MAPB programme). It publishes research papers, power point presentations, videos, graduation works and master theses. This journal encourages student's scientific independence and fosters the struggle against plagiarism. An independent academic attitude is stimulated as well by the seminars, conferences and publications of the Student Scientific Council. These activities are supported by the teaching and administrative staff of the Faculty.

In short, the Faculty ensures appropriate evaluation of the students' level of achievements against the intended learning and educational objectives and promotes academic integrity, with study guidance as a good practice. Hopefully, YSU soon finalizes the reform process of the academic



assessment system. Continuous changes in assessment practices severely hamper a proper evaluation of their effectivity. The panel arrived at the following judgment.

5.4.6 JUDGMENT

Both the Bachelor programme Biology and the Master programme Genetics meet the requirements of the criterion.



5.5. CRITERION 5. RESEARCH AND DEVELOPMENT

The programme promotes its research objectives and projects ensuring links between teaching and learning and research.

5.5.1. Research strategy

In the framework of bachelor programme Biology and the master' programme Genetics, the goal of short term and midterm projects is to link the early years of learning with the scientific research carried out at the departments. The Faculty aims at a substantial increase in the volume of long planned research, expansion of the teaching staff and student's involvement in research projects, and shows a variety of examples of successful research and development. The strategic objective of the research activities of the Faculty is the introduction of new research themes using international standards with use of appropriate modern equipment. The Faculty is creative in this respect, given the financial constraints, and the panel has noticed a gradual and steady improvement in the research structure. The academic staff publishes the results of research work both in national and international journals (however, see 4.2.1). During the last three years, the Faculty carried out four state-funded thematic grant projects as well as a number of international grant projects. YSU mechanisms designed to promote research activities enable the addition of premiums to the salary of successful staff members.

The educational programmes offer a gradual increase in research activities. The first two years of the bachelor programme Biology are dedicated to knowledge and skills. In the third year of study, students get acquainted with research methods, with the analysis of research literature and with the presentation of papers. During the last fourth year of study, students directly participate in scientific experiments under supervision. The results of experiments conducted by the students are completed as a graduation work, which is presented and discussed at the department and eventually accepted for public defence. Fourth-year students can attend student scientific conferences and present their scientific work results. The results are summarized in the proceedings; the most interesting reports are awarded with prizes. The aim of these mechanisms is to generate interest among students to modern, efficient execution of research work and development of proper skills to apply their own research and contribute to their professional growth.

The master programme Genetics consists of two main components, an educational component of 72 EC and a research component of 48 EC. It is highly desirable for students to have published articles before master thesis defence. During the visit of the department of Genetics and Cytology, the panel noted that students directly profit from new research projects and from the use of new equipment. In this respect it is significant that the Faculty does not restrict herself to fundamental scientific research but also has entered collaborations with sectors such as agriculture and health.

In the SER, the Faculty correctly mentions the lack of research space and fully equipped facilities, including computers, as a shortcoming. The panel was happy to experience a creative and positive attitude to cope with this situation. However, attention should be paid to the fact that investments should not be restricted to laboratories and that a proper understanding of the interactions in the



living system also asks for a good insight in natural conditions and thus asks for properly equipped field work and scientific camps.

5.5.2. Development and innovation

Policy and procedures for research activities are based on programme documents following State laws and YSU regulations which clarify the principles of distribution of funds allocated for the development of science. In addition, the Faculty is active in searching for international grants. According to the panel, an admirable example of innovation offers the department of Ecology and Nature Protection, whose infrastructure and research facilities have been impressively updated. The panel noted that not only students directly profit from these developments but that the department directly increased its potential for the attraction of new projects.

5.5.3. Internationalization

Internationalization of research activities is of great importance in the Faculty of Biology. The Faculty recognizes that innovation and development are primarily dependent on international contacts. Publication in high-impact international scientific papers is encouraged and the number of Faculty staff members invited to editorial boards of international journals is increasing. Membership of the academic staff as well as the students in international scientific societies and academies is another manifestation of internationalization. Attendance of international symposia by young scientists and the best students is promoted, although the financial possibilities are constrained. Limited funding is available from YSU and from the Ministry of Education and Science, and consequently staff and students seek funding by national and international foundations and organizations. Obviously, internationalization of research activities within the frames of the academic programmes is a priority for the Faculty of Biology.

As a good practice, the panel noted that since 2010, fourteen Ecology students could participate in an international exchange programme.

5.5.4. Research-intensive education

The role of research in the bachelor programme Biology and the master programme Genetics has been summarized above. Improvement of research and creative activities in the educational process is of great importance, and in accordance with YSU policy.

Research is an essential educational method in scientific programs. It trains the students in critical thinking, in problem solving, in scrutinizing results of other people and own results, and much more. As such, research-oriented education asks for sound didactic base preferably visible from the first year on. At the moment, this base is lacking in the Faculty (and in the large majority of Science faculties in the world). As a start, the Faculty may like to design an introductory course on research and research methods in biology for all students early in the bachelor programme. Introductory course of research methods is too important for implementation of scientific-based education and



formation of scientific outlook in students. This is the more appropriate because at present not all students have access to proper research training.

In short, the programmes promote research as an essential part of academic education. The atmosphere in the Faculty is research-minded and the staff is creatively using its limited possibilities. The panel arrived at the following judgment.

5.5.5 JUDGMENT

Both the Bachelor programme Biology and the Master programme Genetics meet the requirements of the criterion.



5.6 CRITERION 6. LEARNING ENVIRONMENT

The quality of educational provisions are ensured through creating favourable environment for learning

5.6.1 Facilities and resources

Six departments in the Faculty of Biology (Biology, Zoology, Genetics and Cytology, Human and Animal Physiology, Microbiology and Biotechnology of Plants and Microorganisms, Ecology and Nature Protection) are responsible for the learning environment for the bachelor programme Biology. Each department contributes with specific rooms and equipment. The facilities comprise the usual standard equipment, which is used as a teaching aid and for laboratory and practical purposes, including yearly projects and essays. The educational complex "Marmarik" is available for field work. Additional facilities are available in other departments of YSU, especially in those of Physics and Chemistry.

The department of Genetics and Cytology covers the learning environment of the master programme Genetics. The educational and research parts of the programme are supported with research equipment specific for this scientific field.

During the last two years the Faculty of Biology significantly improved its facilities by getting new equipment and chemical reagents for the proper implementation of educational processes, and development and improvement of necessary resources is a matter of constant attention. This is important in view of the rapid developments in biological sciences.

Next to appropriate technical resources, the Faculty offers an intellectually stimulating environment. Several illustrations have already passed in the preceding chapters. The panel got a positive impression of the learning environment during a well-appreciated tour through the main building. Obviously, the struggle for funding is a constant theme throughout this report. However, the learning environment in the Faculty is developing in the right direction. During the site visit, it turned out that given the limited possibilities of the financial resources and some outdated facilities, many essential scientific activities continue to be carried out, with good use of YSU support and international grants. Given the limited possibilities, the panel is positive about the efforts of the staff to create stimulating and favourable conditions for an academic study.

5.6.2 Programme information

Students of both bachelor and master programmes are appropriately provided with information concerning the structure and contents of the educational programmes as well as the organization of the educational process, and the students' obligations and rights. They get the information in three main ways, i.e. from the manual or the electronic version of "Training guide and course reference book", from the Study Guide, from material uploaded in web sites, as well as from the consultants and supervisors of the programmes. Curators, the Dean's office, the vice-Dean and staff from YSU, all cooperate to supply the students with adequate information. Programme specifiers of both programmes will be available for all students from the start of the academic year 2013/14.



Despite the availability of all this information, especially some bachelor students are not always fully informed about requirements and organizational peculiarities, partly because of lack of motivation and partly of lack of computer literacy. On the other hand, some lecturers still do not effectively use online facilities for education and information. YSU is solving this problem by including computer training in the staff development programme.

The panel underscores that the website should play a larger role in the student information system and urges the Faculty to remove the mentioned shortcoming that the department administration does not always carry out proper control and monitoring of complete provision of the teaching material by the lecturers.

5.6.3. The educational-methodological basis

The Faculty offers the teaching and methodological basis to successfully implement the educational programmes of Biology and Genetics. These programmes are worked out according to the criteria of state educational requirements including plans, courses and practices. The programmes are provided with methodological manuals and instructions, as well as multi environmental video/audio materials and illustrative guides. Various educational and production practices are organized for students in different types of organizational legal companies, enterprises and institutions in order to help them obtain experience and skills for their perspective workplace. Both, bachelor and master students are involved in this process.

The implementation of the educational programmes in Biology and Genetics includes laboratory work and practical seminars carried out by students in their specialty. Students have to fulfil practical tasks by means of computer applied programme packages which are viewed as obligatory in their studies. Creation of a data base is also compulsory ensuring preparation of high performing specialists. Professors and other teachers compile textbooks, educational manuals and methodological guidelines in the mother tongue, published with the help of the YSU governing body which provides the necessary amount of money. These publications are complimentary to the methodological literature available in the YSU library.

As a result, a bachelor is sufficiently trained to apply for a master programme. About seventy five per cent of the Biology graduates continue to a master study. Master students get an adequate level of scientific training to enter the professional world. The students Genetics told the panel to be contented with the education they get. During the last five years, twenty eight master students graduated from the department of Genetics and Cytology, most of them finding work in their specialty in scientific research institutions. Four of these have become post-graduates and two works in foreign scientific centres.

In short, the panel encountered a stimulating learning environment, forming a sound basis for academic education. The quality of educational provisions is gradually improving and the staff knows what to do for further development. The panel arrived at the following judgment.



5.6.4 JUDGMENT

Both the Bachelor programme Biology and the Master programme Genetics meet the requirements of the criterion.

5.7 CRITERION 7. QUALITY ASSURANCE

The programme has an internal quality assurance system that promotes its maintenance and continuous improvement.

5.7.1. Structure and functions

In general, biology institutes are characterized by an informal and collegial quality culture. The Faculty of Biology, YSU, is not an exception. The panel values this aspect of quality culture: shared values and a common understanding of what academic education and the educational role of research are about. However, this culture does not match with the present demand for clarity with regard to rights, duties and responsibilities. Presently, the internal quality assurance system of the Faculty of Biology is based on the YSU quality assurance strategy. Various elements of the system have been mentioned in the SER and in the preceding chapters of this report, such as the Educational-methodological committee, the curators, the review system and the Student and Scientific Councils. Still, it is obvious that a coordinated system is in the stage of development, and at present the effectivity of the system can not conclusively be evaluated. The Faculty is well aware of this and has anticipated on the present situation by setting up a Quality Assurance committee, in order to coordinate the various actions. Its coordinating influence may be visible soon. The commendable initiative of the Faculty to apply for programme accreditation will yield a fruitful framework for the activities of this committee. Hopefully, the Faculty realizes that the SER is in the first place a valuable internal strategic document rather than a bureaucratic prerequisite for accreditation.

To improve and modernize the programmes, more efficiency and decisiveness will be required. A structural input from students will be required, and students and teachers should work together in monitoring and periodic review processes of academic programmes. As an example, better formalization of the process will result in less variety of the structure of bachelor graduation works, in line with the formalized structure of research articles, and in a more and better specified evaluation form for the master thesis.

5.7.2. Policies and procedures

Not all procedures and mechanisms of quality assurance developed by the YSU quality assurance department are sufficiently used by the Faculty of Biology. The Faculty of Biology plans to implement all procedures starting from the academic year 2013/2014, with specific attention for the annual monitoring and periodic review of bachelor and master programmes and, obviously, for work in line



with the experiences of the programme accreditation process. In the Plan-Do-Check-Act (PDCA) cycle of quality control, the cycle must be closed. Given the good quality attitude of the Faculty, the panel has good hopes that this will happen soon.

5.7.3., 5.7.4., 5.7.5. Feedback, stakeholders and good practices

Participation of students, alumni and other internal and external stakeholders is of high importance to ensure quality assurance of the bachelor programme Biology and the master programme Genetics. It should be noted that in the Quality assurance committee, except teachers and other administrative staff members, a student representative is also involved who presents students' feedback on the raised issues. The Quality assurance committee also involves in its work invited heads and members of final examination and final work papers committees, as external stakeholders. The panel notes that input from other external stakeholders such as employers in the areas of agriculture and health and input from alumni, as tools in quality control, can be better utilized as part of the Check in the PDCA cycle, despite the weak professional labour market in the country.

The Faculty Quality assurance committee, as well as the Educational-methodological council aim to discuss several new approaches to promote the development and quality control of study programmes at the Faculty of Biology. These new approaches were developed and piloted in collaboration with the Quality assurance centre of the University of West England within the frames of another Master's Degree programme in Applied Biosciences developed in the TEMPUS programme. The panel encourages the Faculty and the Quality Assurance committee to find and share good practices of quality control of academic programmes in the European Higher Education Area.

In short, the panel appreciates the collegial and informal quality culture in the Faculty, and considers it a good basis for the presently required formalization. YSU policy aims at closing the PDCA cycle at all levels of the university, including the faculties. This implies the availability of plans for vital educational issues, corresponding action lists with deadlines, transparent monitoring and analysis of results and a clear policy of decision-making based on the outcomes of the analysis. Obviously, Faculty and university should make a good division of tasks in order to avoid double work. The panel appreciates the quality output realized, the awareness of the shortcomings and the fact that these shortcomings are not specific for the Faculty but largely result from YSU culture. However, at present the Faculty formally lacks an internal quality assurance system that promotes its maintenance and continuous improvement. Consequently, the panel arrived at the following judgment.

5.7.6 JUDGMENT

Both the Bachelor programme Biology and the Master programme Genetics do not meet the requirements of the criterion.



6. OVERVIEW OF THE ASSESSMENTS

CRITERION	DECISION Bachelor Biology	DECISION Master Genetics
Academic Programme Design and Approval	No	YES
Teaching staff	YES	YES
Teaching and Learning Assessment	YES	YES
Student Assessment	YES	YES
Research and Development	YES	YES
Learning Environment	YES	YES
Quality Assurance	No	No



ANNEX 1. THE CURRICULA VITAE OF THE PANEL MEMBERS

Professor dr J.W. (Jan) Kijne - (1947), retired professor of Bioscience at Leiden University. J. Kijne was professor of Phytotechnology (1994–1997), Plant Physiology (1997 – 2006) and Bioscience (2006–2010) in Leiden, and guest professor of Microbiology at Tromsø University, Norway (1995–2000). He also was educational director of the biology programmes (1996–2002) in Leiden, vice-dean of the Faculty of Science (2002–2008), and scientific director of the Pre-University College, Leiden (2004–2008). J. Kijne has been chair of the evaluation committee for the degree programmes in Biology in the Netherlands and a member of various other evaluation committees.

Professor dr. Yuri Tadevosyan- leading researcher and the head of laboratory at Institute of Molecular Biology National Academy of Sciences (NAS), Republic of Armenia (RA) started from 1997 to present. His current research activities are investigation of the molecular mechanisms of signal transduction, lipid second messenger molecules rapid and reversible formation and membrane lipid modifications at norm and in cancer.

He also was a consultant-biochemist at the Department of Pharmacology (2000-2004) and at the Scientific Research Centre (1994-2004) of Yerevan State Medical University.

Yuri Tadevosyan is a professor of the Department of Biomedicine at Russian-Armenian (Slavonic) University (2011-present) and of the Department of Molecular and Cellular Biology at International Scientific Educational Centre, NAS RA.

He was awarded by the Higher Certification Committee of the Ministry of Education and Science of the Republic of Armenia as a full professor in the field of Biology (2008), in 1997 he was awarded by the Higher Certification Committee of the Ministry of Education and Science of the Republic of Armenia as a Doctor of Sciences in the field of Biochemistry. In 1978 Yuri Tadevosyan was awarded by the Higher Certification Committee of the USSR Ministry of Education as a PhD (Candidate of Biological Sciences) in the field of Biochemistry.

In 2008 Y. Tadevosyan invented the mode for diagnostics and/or state value of leukemia's (versions) (Patent, AM 2256, G01N 33/49:) and in 2009 he invented the mode for cancer diagnostics and/or estimation of pathological state (Patent, AM 2311, G01N 33/53:).

He is a member of Scientific Council of the Institute of Molecular Biology NAS RA (2006 to present) and Armenian Association of Biochemists affiliated to Federation of the European Biochemical Societies (FEBS), (2002 to present).

Y. Tadevosyan has 67 papers in refereed journals.

Professor Gayane Vardanyan, - is a professor of Department of Biochemistry at Yerevan state medical University from 1988 to present. Her current activities are teaching biochemistry, doing presentations and reading lectures, preparation of educational programme, management of scientific research, supervising of dissertations.

G. Vardanyan is a professor of Department of Biochemistry at Russian-Armenian (Slavonic) University from 2009 to present.

She is member of FEBS (Federation of European Biochemical Society) from 1999 to present.

Professor Gohar Musheghyan- from 1989-1992 completed postgraduate studies in human and animal physiology. In 1999 defended a scientific thesis on "Influence of brain noradrenergic system on the cerebellum's central nucleuses' background impulse activity" theme and in 2000 achieved biological sciences degree with the specialty (G. 00.09) of Human and Animal Physiology. In 2002



based on the results of secret voting she held in the scientific board meeting of the Biochemical faculty, was elected as an assistant to the chair. In 2009 she received the associate professor degree with the specialty of biology. In 2009 G. Musheghyan received Assistant–professor of department Ph.D in Biology.

2005-2008 G. Musheghyan studied at the doctoral candidacy of doctoral-biological international post Graduate chair center of UNESCO with the specialty of “Human and Animal Physiology” (G. 00.09) (full course) and gave credits from Neurology, Nerve Cell Physiology, Biophysics and Radiobiology subjects, participated and still participate in international seminars and scientific conferences.

Over 13 years she is teaching at Armenian State Pedagogical University after Kh. Abovyan, at the faculty of Biology, Chemistry and Geography. She is teaching Human and Animal Physiology, Pathological Organization and Physiology Basics, Hearing, Vision, Speech, Anatomy, Physiology and Pathology, Basics of Child Health, Physiology of central and vegetative nervous system.

G. Musheghyan is member of physiological company.

Tsovinar Qechechyan- 4th year student from Yerevan State Linguistic University after V. Brusov. Tsovinar Qechechyan participated in ARQATA Training students on IQA and EQA held in September 11, 2012.

ANNEX 2. AGENDA OF THE SITE-VISIT OF THE EXPERT PANEL FOR PILOT PROGRAMME ACCREDITATION

PART IV – Pilot Programme Assessment YSMU, BSc Biology and MSc Genetics – June 2013

- Wednesday 19 June – panel meeting programme assessment (afternoon)
- Thursday 20 June – interviews programme assessment
- Friday 21 June – interviews programme assessment & panel meeting
- Saturday 22 June – feedback session programme assessment (morning)

Chair: prof. dr. Jan Kijne (Leiden, Netherlands)

Wednesday June 19	panel meeting programme assessment (afternoon: 14:00-18:00)
14:00 – 18:00	Panel meeting (acquaintance, discussion of self-assessment, preparation of interviews, reading of documents)
	< dinner with panel & ANQA coordinator >
Thursday June 20	interviews programme assessment (full day: 09:00-18:00)
09:00 – 10:30	Chairman Faculty of Biology, Programme director Biology, Programme director Genetics, editors self-assessment
10:30 – 10:45	Panel meeting (discussion)
10:45 – 11:30	Bachelor students Biology (two from each year: total 8)
11:30 – 12:15	Master students Genetics (total 6 – 8)
12:15 – 13:00	Teaching staff Biology (total 6, from different sub disciplines)
13:00 – 13:45	Panel lunch
13:45 – 14:30	Teaching staff Genetics (total 6)
14:30 – 16:30	<i>Learning environment</i> Visit of teaching facilities (lecture rooms, laboratories, course rooms, library, computer facilities, interviews with technical assistants)
16:30 – 18:00	Panel meeting (impressions, reading of documents, e.g. master theses, study reports, written exams, programme evaluations)
Friday June 21	interviews programme assessment & panel meeting (full day: 09:00-18:00)
09:00 – 10:00	<i>Assessment</i> (tests, exams, reports, diplomas, study results) Examination committee, study advisors (Biology and Genetics)
10:00 – 11:00	<i>Quality control</i> Programme evaluation committee, student committee (Biology and Genetics)
11:00 – 11:15	Panel meeting (discussion)
11:15 – 12:00	Academic service staff (e.g. study information, mobility, help desk)
12:00 – 13:30	Panel meeting (preparation of concluding talk with programme directors, lunch)
13:30 – 14:30	Chairman Faculty of Biology, Programme director Biology, Programme director Genetics
14:30 – 17:00	Panel meeting (conclusions, outline report)
Saturday 22 June	feedback session programme assessment (morning: 10:00-12:00)
09:00 – 10:00	Presentation of initial findings by panel



ANNEX 3. RESOURCES REVIEWED BY THE PANEL

1. Chair of Genetics and Cytology, laboratory of "General biology", group of Genetics and Cytology
2. Chair of Microbiology and Biotechnology of Plants and Microbes, laboratory of "General biology", group of Microbiology and Biotechnology of Plants and Microbes
3. Chair of Botany and Mycology, laboratory of "Biology of Fungi and biotechnology"
4. Chair of Humans and Animals Physiology, laboratory of "General biology", group of Humans and Animals Physiology
5. Chair of Zoology, laboratory of "General biology", group of Zoology
6. Computer resources
7. Chair of Ecology and Nature Protection, laboratory of "General biology", group of Ecology and Nature Protection



ANNEX 4. LIST OF THE ABBREVIATIONS

1. **ANQA**-National Centre for Professional Education Quality Assurance, Foundation
2. **ANQF**- Armenian National Qualification Framework
3. **ARQATA**- Armenia Quality Assurance Technical Assistance
4. **ECTS**-European Credit Transfer System
5. **ESG**- Standards and guidelines for Quality Assurance in European Higher Education Area
6. **NVAO**-Dutch-Flemish Accreditation Agency Organization
7. **PDCA**- Plan Do Check Act
8. **QA**- Quality Assurance
9. **RA**- Republic of Armenia
10. **SER**-Self-evaluation report
11. **YSU**- Yerevan State University