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ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ
ΠΟΙΟΤΗΤΑΣ
ΑΝΩΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

HELLENIC REPUBLIC
H .Q .A .A .
HELLENIC QUALITY ASSURANCE
AGENCY
FOR HIGHER EDUCATION

EXTERNAL EVALUATION REPORT (final report 05-12-2011)

DEPARTMENT | AGRICULTURAL BIOTECHNOLOGY |

UNIVERSITY | AGRICULTURAL UNIVERSITY OF ATHENS |

Version 2.0
October 2011

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External Evaluation Committee

The Committee responsible for the External Evaluation of the DEPARTMENT OF AGRICULTURAL BIOTECHNOLOGY, AGRICULTURAL UNIVERSITY OF ATHENS consisted of the following five (5) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005:

1. _Prof._____***Christos A. Ouzounis***_____Principal Investigator – CERTH and Professor, CCBR, University of Toronto, Canada_____(Coordinator)_____
2. _Prof._____***Spyridon Agathos***_____Professor of Biotechnology, University of Louvain, Louvain, Belgium_____
3. _Dr._____***Mattheos Koffas***_____Associate Professor, Center for Biotechnology & Interdisciplinary Studies, Rensselaer Polytechnic Institute (RPI), USA____
4. _Dr._____***Anastasios Papageorgiou***_____Professor of Structural Biology, Biocity Turku, University of Turku, Turku, Finland_____
5. _Prof._____***Athanasios Theologis***_____Professor Emeritus, Department of Plant & Microbial Biology, University of California - Berkeley, USA_____

N.B. *The structure of the "Template" proposed for the External Evaluation Report mirrors the requirements of Law 3374/2005 and corresponds overall to the structure of the Internal Evaluation Report submitted by the Department.*

The length of text in each box is free. Questions included in each box are not exclusive nor should they always be answered separately; they are meant to provide a general outline of matters that should be addressed by the Committee when formulating its comments.

Introduction

I. The External Evaluation Procedure

▸Dates and brief account of the site visit

The site visit was conducted between the 3rd and the 7th of October 2011. It involved briefings by the Rector Prof. K. Fengeros, vice-Rector of Academic Affairs Prof. E. Paplomatas, vice-Rector of Financial Affairs and Research Prof. G. Papadakis, and Department Chair Prof. D. Bouranis. A formal presentation by the Department Chair was subsequently provided in the presence of members of the Internal Evaluation Committee (IEC), Prof. S. Kintzios, Assoc. Prof. N. Labrou, Assist. Prof. G. Zervakis, Assist. Prof. E. Flemetakis and Lecturer S. Rigas.

▸Whom did the Committee meet?

The EEC met with the following:

- all members of the faculty (ΔΕΠ),
- scientific technical staff,
- undergraduate and postgraduate students,
- administrative staff.

Monday October 3, 2011

9:30. The EEC was briefed at ADIP headquarters by Profs. Economou and Amourgis on the goals and the procedure of the external evaluation process.

13:00. Meeting at the Agricultural University of Athens Rector's office, Prof. K. Fengeros.

The EEC was briefed by the University's Rector Prof. Fengeros, the vice-Rectors Profs. Paplomatas and Papadakis, and the Chairman of the Department of Agricultural Biotechnology (DAB) Prof. D. Bouranis. They provided information on the University's mission, teaching, educational, and research activities, and answered questions from the committee members. Furthermore, a presentation of the history, evolution, structure and current state of the DAB was given by Prof. Bouranis in the presence of the IEC.

Specifically, the following items were presented in greater detail:

- - Historical background,
- - Undergraduate program of study,
- - Postgraduate program of study,
- - Research activities, including performance metrics, funding and strategies.

▸List of Reports, documents, other data examined by the Committee

The EEC was provided with the IEC report, the powerpoint presentation by the Chair, an updated list of publications and funding record per faculty member, citation impact statistics, facts and figures regarding teaching, outreach and social activity materials, plus additional documents by individual faculty, which selectively described the teaching and research activities of their groups.

▸Groups of teaching and administrative staff and students interviewed

The EEC had formal discussions and informal meetings with most of teaching and administrative staff. An ad-hoc meeting with graduate students was also requested and organized, without the participation of staff so that students voiced their various issues with teaching, research and facilities.

▸Facilities visited by the External Evaluation Committee

The External Evaluation Committee (EEC) subsequently visited most of the University facilities, teaching and research laboratories, administrative offices, lecture halls and classrooms, the library, and had a tour of the campus, including the Agricultural Museum and Archives, and the University's Conference Centre.

II. The Internal Evaluation Procedure

Please comment on:

▸Appropriateness of sources and documentation used

The EEC received most of the documents and information required for the evaluation process. The documentation provided to the EEC was adequate and well presented. The documentation spanned

the period 2004-2008. However, upon request by the EEC, additional information covering the years 2009-2011 was provided.

‣Quality and completeness of evidence reviewed and provided

The DAB staff have provided high-quality and comprehensive evidence for the evaluation process. They have also responded rapidly to additional requests by the EEC during the on-site visit.

‣To what extent have the objectives of the internal evaluation process been met by the Department?

The objectives of the internal evaluation process were met. However, the range of the requested documentation has exceeded substantially the contents of the internal evaluation report.

GENERAL COMMENTS

Overall, the evaluation process was smooth and the visit well-organized.

A. Curriculum

To be filled separately for each undergraduate, graduate and doctoral programme.

APPROACH

‣What are the goals and objectives of the Curriculum? What is the plan for achieving them?

Overall, the curriculum aims to prepare agricultural biotechnologists with a strong background in the fundamentals in plant molecular biology, chemistry and physics. The faculty members are making efforts to achieve this through a well-planned and broad curriculum.

‣How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?

The objectives are fully consistent with the Department's mission and are collectively decided among the faculty during regular Departmental meetings. Factors that were taken into account were the faculty's intention to implement a stronger biological curriculum and their desire to enhance the graduates' laboratory skills, in view of the applied nature of their future employment. This is evidenced by the five-year program duration and the high number of laboratory courses.

Stakeholders that may have influenced the decision-making process regarding the curriculum preparation include the DAB alumni. However, the Department strives to maintain its distinct identity of Agriculture Biotechnology within the national context.

‣Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?

Yes. One issue that has arisen is a tighter connection with the local and national industry requirements.

‣How was the curriculum decided? Were all constituents of the Department, including students and other stakeholders, consulted?

The EEC understands that the curriculum has developed based on needs, requirements and also limitations imposed by staff and timetables. Overall, it appears that all constituents of the Department have positively contributed to this goal.

‣Has the unit set a procedure for the revision of the curriculum?

There doesn't seem to be a formal procedure for curriculum revision. The Department's assembly discusses academic issues relating to the curriculum regularly. The DAB has a committee on curriculum monitoring, while an inter-departmental committee on Undergraduate curricula deals with the implementation of the currently reformed curricula (subject matter, ECTS values, etc.). The biotechnological and agronomical aspects of the undergraduate curriculum have been recently more balanced, even though there is still debate as to the optimal mix between the two. An attractive feature of the curriculum is the fact that a 4-month practical exercise is required as well as a final-year research dissertation, which includes the preparation of a final written document and an oral presentation.

IMPLEMENTATION

‣How effectively is the Department's goal implemented by the curriculum?

- How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?
- Is the structure of the curriculum rational and clearly articulated?
- Is the curriculum coherent and functional?
- Is the material for each course appropriate and the time offered sufficient?
- Does the Department have the necessary resources and appropriately qualified and trained staff to implement the curriculum?

The existing curriculum serves the goals of the Department, is of high standards and is executed efficiently. The curriculum is coherent and focused on preparing graduates with experimental skills in laboratory and applied biological processes for agricultural practice, industry and other sectors.

Most of the faculty members are well-trained and committed to teaching, research, and outreach activities. This is evident by the quantity and quality of laboratory exercises the students perform in the various courses throughout their studies.

The presence of well-trained and experienced laboratory assistants meets the needs for teaching the various subjects, both theoretical and especially laboratory courses. The EEC realized that because these staff members, most with PhD degrees, are really dedicated and inspired by the academic environment, they do an excellent job in implementing the teaching curriculum of the DAB. Considering that they need to break the huge classes in two or even three groups for laboratory exercises, they spend a substantial amount of hours with the students in overtime. Some are also engaged in research projects, keeping their CVs at a competitive level. However, some of them feel that their contributions are not fully appreciated, especially with respect to being recognized as PIs in research proposals, and their career development prospects appear limited. More should be done towards this direction and the DAB might consider reward mechanisms for laboratory assistants.

RESULTS

- How well is the implementation achieving the Department's predefined goals and objectives?
- If not, why is it so? How is this problem dealt with?
- Does the Department understand why and how it achieved or failed to achieve these results?

The undergraduate students seem to prefer an earlier exposure to biotechnology-oriented subjects already during the first two years of the curriculum, during which more basic courses are provided and there is a lack of momentum for junior undergraduates. One possibility might be to give an introductory survey course on Agricultural Biotechnology in each of the two first years. Some organizational difficulties were apparent, due to the conflicting schedules of optional or elective courses in later semesters.

A good practice should include the posting (also on-line) of the syllabus of each course at the beginning of every semester, if possible with the exact dates for midterm and final exams. The same should be practiced with laboratory courses.

The faculty members seem to respond to the students' feedback on curriculum issues.

Regarding the postgraduate curriculum, there is a perception among several students that there is significant overlap between subject matters of undergraduate and postgraduate courses.

IMPROVEMENT

- Does the Department know how the Curriculum should be improved?
- Which improvements does the Department plan to introduce?

The DAB is fully aware of the need to achieve the right balance between agricultural and biotechnological subjects. This is important in view of the "branding" of the program and its graduates for subsequent career choices. Also, in view of the anticipated restructuring of the Department into a larger School, the curriculum might benefit from a two-way exchange with curricula from other Departments.

The Committee appreciates the experimental/laboratory orientation of the Department.

The issue of equivalence of the 5-yr ptychio with a Master's level degree across Europe (giving direct access to Ph.D. studies) should be further investigated by the Department in view of the post-graduate degree offered locally, which is a prerequisite for further Ph.D. studies in Greece.

The DAB is aware of the need for further improvement and streamlining of the undergraduate curriculum and plans to charge the undergraduate curriculum committee with the mission (a) to replace some of the common trunk courses of the first 6 semesters that are mostly unrelated to the Department's orientation with more relevant courses and (b) to introduce new electives in later semesters. The EEC concurs to the above plans but cautions against the swelling of the overall number of undergraduate courses, which is judged already as borderline excessive.

The members of the faculty are encouraged to take measures towards respecting the flow of the curriculum (i.e., prerequisites to be filled prior to moving to subsequent courses).

In addition, a tighter coordination between faculty members and departmental teaching assistants (ΕΕΔΙΠ) is deemed desirable.

Finally, the EEC finds, in broad agreement with the DAB, that the post-graduate and doctoral studies, although already at a good level, could profit from a better definition and implementation of quality criteria for candidate selection in these programs.

GENERAL COMMENTS

The curriculum is well-organized, at times excessive, yet providing significant value for the students' success in their next steps. A certain long-term vision might be required in the near future, given the eminent changes in the educational system nationally.

B. Teaching

To be filled separately for each undergraduate, graduate and doctoral programme.

APPROACH

Does the Department have a defined pedagogic policy with regard to teaching approach and methodology?

Please comment on:

‣Teaching methods used

Power point, blackboard and demonstrations, field trips, access to electronic material on-line.

‣Teaching staff/ student ratio

The teaching staff is basically adequate and it includes the faculty plus other scientific personnel, permanent and non-permanent (ΕΕΔΙΠ), plus some PhD students. However, a major problem arises from the much higher number of admitted students each year, compared to the number the Department can realistically host and train. Thus, the personnel need to offer the same laboratory exercises several times, often during the same day, which significantly increases their workload

According to the information provided, the ratio of students to faculty can be up to 40:1 in some courses, a level unacceptable by any international standard; it should be much lower.

‣Teacher/student collaboration

Faculty and students seem to be getting along very well. The instructors are easily accessible even though there is no official policy for office hours.

‣Adequacy of means and resources

Very good.

‣Use of information technologies

Resources such as classrooms, teaching equipment and information technologies are generally adequate and are used effectively for achieving their teaching goals. The committee was impressed not only with the abundance of optical microscopes used for teaching but also with the electron microscopy facility which serves as a powerful teaching resource. All faculty and other supporting personnel appear enthusiastic and up-to-date in pursuing their educational aims.

Extensive use of the internet, library resources and presentation facilities is the norm. A better use of IT classrooms and other technologies might be recommended.

‣Examination system

Apparently, there is some flexibility in the manner each faculty member examines their students but mostly emphasis is placed on final exams. However, we recommend that as a rule, each student should be examined on at least two different occasions, for example one midterm exam and one final exam. The grades for the courses should be based preferably on written exams with a concerted effort to curb the practice of cheating ("antigrafi") by basing the exams on questions of judgement.

The final grade for courses comprised of theory and lab exercises is based on separate exams. Each instructor selects the type of examination and the relative weight between theory and lab. The EEC

recommends that a general guideline for streamlining the examination should be implemented. The weight of the lab course and the theory should be specified, should be known to the students from the beginning of each semester and should be adhered to by all parties.

IMPLEMENTATION

Please comment on:

‣Quality of teaching procedures

Very high and in accordance to international standards, except cases where student number can be excessive.

‣Quality and adequacy of teaching materials and resources

The Committee approves of the teaching procedures, material and resources.

‣Quality of course material. Is it brought up to date?

The faculty members generally make a strong effort to use high quality textbooks that are widely acceptable by the international scientific community, several of which have been translated into Greek. Other textbooks of equally good quality in terms of content and illustrations have been directly developed by some faculty members. In general, the EEC saw an effort to use textbooks that are up-to-date, although in a few cases the notes and other material used were out-of-date.

‣Linking of research with teaching

The best evidence for linking teaching with research is the fact that the program provides the final-year diploma research thesis; thereby each student has the opportunity to put into practice in the lab most or part of their theoretical training. Even though it is optional, every faculty member supervises about two undergraduate students per year, pursuing research projects that in many occasions result in original peer-review publications. Nevertheless, lack of adequate research funding imposes severe problems and limitations in this activity, which will be discussed further in another section.

The post-graduate students would benefit from an exposure to brief rotations in laboratories outside their own.

More extensive use of English in post-graduate teaching could be beneficial for both Greek and international students. The EEC, during student interviews, found that this would be a welcome development with minimal cost, given that English is widely spoken by both staff and students. This can also be an advantageous element in attracting more foreign students at all levels.

‣Mobility of academic staff and students

Although the opportunities exist and are announced properly within the Department, not many students take advantage of these exchange programs, primarily because of limited or non-existent international accords between AUA and foreign universities. An effort should be made to encourage mobility further. The faculty is engaged in multiple collaborations outside the Department and encouraged to be more extroverted.

‣Evaluation by the students of (a) the teaching and (b) the course content and study material/ resources

There is an official mechanism for the students to evaluate both the faculty and the course content. This is clearly an excellent way for receiving feedback by the students. The EEC believes that there is a need to include the option of additional comments on the distributed questionnaires. We presume the results of teaching evaluations are taken into consideration in a comprehensive way for course revisions and various other issues.

RESULTS

Please comment on:

‣Efficacy of teaching

The faculty members are efficient in meeting their teaching goals. A good assortment of teaching methods is applied, including class and lab teaching, lab practicals, literature reviews, project presentations, site visits. It is important that faculty members have ample assistance from the scientific personnel, which is helping in the teaching duties, and for running the practical classes/ laboratories for various courses. Therefore, the goals here are achieved effectively.

‣Discrepancies in the success/failure percentage between courses and how they are justified

The EEC was not provided with detailed data on this issue. However, the overall success rates seem to increase as students progress to senior semesters (courses of distinct orientations/electives) compared to the early semesters of study (trunk courses common to all agronomy students). This might reflect the increased motivation (and maturation) of the students for courses that are closer to their interests (i.e., those that prompted them to choose this Department in the first place) and the pressure they feel for finishing their studies. In contrast, most post-graduate students achieve course grades of 9 or more, which reflects their motivation (a factor being that they pay tuition). The discrepancy issue for junior/senior undergraduates might be addressed with the proposed introductory survey course on Agricultural Biotechnology in each of the two first years(see above).

‣Differences between students in (a) the time to graduation, and (b) final degree grades

The average time to graduation is a little over 7 years, which is quite long for a 5-year program. According to the data provided to the EEC, the average graduation grade hovers around 7.5. Although these metrics are not unusual in the Greek system of higher education, it is desirable to improve them. A possible solution to the problem is for the students to be given incentives to attend regularly and conscientiously the lectures. Although currently the students are not obligated to attend the theory part of courses (only laboratory attendance is mandatory), the EEC encourages the faculty to take appropriate measures towards increasing lecture attendance (quizzes, mid-term evaluation, change of examination system).

‣Whether the Department understands the reasons of such positive or negative results?

As mentioned above, a major explanation for the less satisfactory results in student grades and performance is attributed to the poor class attendance, which according to the law is not obligatory. The EEC makes a clear recommendation to the faculty to find ways for remedying this weakness.

IMPROVEMENT

‣Does the Department propose methods and ways for improvement?

‣What initiatives does it take in this direction?

The EEC did not discuss any such methods with the faculty. Apparently, it was not something that the faculty was aware of. As a matter of fact, though, in case the Department achieved 100% attendance in all classes they would be faced with a classroom space problem, as many classrooms cannot accommodate all the students at once. This is already a problem with the mandatory laboratories, which must be given on multiple sessions (see eslewhere).

Another issue is related to the consumables used for teaching laboratories. Because of the diminishing trend in the centrally allocated budget, there is money shortage for materials/reagents used for laboratory exercises, which compromises the quality of teaching.

GENERAL COMMENTS

Overall, the teaching process is of high standards and all parties involved appreciate this. Graduate students were encouraged by the EEC to be more actively involved in providing feedback to faculty and optimize staff-student interactions.

C. Research

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

APPROACH

‣What is the Department's policy and main objective in research?

Most faculty members have the ambition to publish high quality peer-review papers, in the area of their expertise. The quality and quantity of research output are both important for faculty promotion and constitute determining factors in each laboratory's visibility and attractiveness. Undergraduate, postgraduate, and PhD students as well as postdoctoral fellows are contributors of research in the area of the faculty expertise. The final-year students have the option to carry out a one-semester research project, while the postgraduate students are required to complete a one-year Master's level research project in one of the Department's laboratories. In some cases, members of specialized laboratory and teaching staff (ΕΕΔΙΠ) who are Ph.D. holders are also valuable contributors in research projects. Given the chronic shortages of research funds, the involvement of

these constituencies in research activities assures student training in a research environment and provides quality technical skills to the faculty members.

‣Has the Department set internal standards for assessing research?

There are no internal departmental standards (such as number of publications per year, average IF of publications, number/percentage of publications with high impact factors, etc). However, faculty promotion is based on research output. The EEC did not have the time and the opportunity to discuss adequately faculty promotion. However, based on CVs, it was obvious that some faculty are clearly more productive than others in research output and publications. Nevertheless, the actual contribution of some faculty members in publications cannot be clearly ascertained.

IMPLEMENTATION

‣How does the Department promote and support research?

The Department supports and promotes undergraduate and post-graduate students as well as doctoral candidates and some post-doctoral personnel to engage in research. It is always desirable, however, to adopt a tighter, more focused research policy that can optimize the use of resources and the international presence of the Department in a few, key areas.

‣Quality and adequacy of research infrastructure and support

The quality of research infrastructure varies among laboratories. In some sections there is adequate equipment that supports reasonable research, which enables faculty to set goals leading to solid publications. However, some other laboratories are less well-equipped. With some notable exceptions, the lack of research funding prevents them from obtaining enough consumables for their everyday research needs. This has a bearing on recruiting good PhD students as they rarely secure money for elementary stipends of these students. It is very difficult to accept that there are PhD students who carry out research for 3-4 or more years without any financial support. In addition, the assertion of at least one faculty member that a lack of external grants is not a major impediment for high-quality research has been puzzling the EEC.

‣Scientific publications

‣Research projects

‣Research collaborations

The publication output is considered at an adequate level, but with ample room for improvement, given the current average level of 0.8 – 1.8 publications per faculty member and per year. There are several funded research projects in progress that are conducted by about one-half of the faculty members. At the same time there is a good number of collaborations and networking within and outside Greece. There are publications of a few groups with co-authors from several other centers and Universities, which shows that a core of dynamic faculty members is pursuing high quality and excellence.

The EEC considers that changes such as the reduction of the teaching load will free up time to invest in research and grant writing, although it is already obvious that several faculty have engaged in intense grant writing in the recent years. The EEC also recommends that a major effort is made by the Department in collaboration with the Rector's office to obtain more money from central University sources in order to support with start-up funds newly-appointed lecturers.

RESULTS

‣How successfully were the Department's research objectives implemented?

‣Scientific publications

‣Research projects

‣Research collaborations

‣Efficacy of research work. Applied results. Patents etc.

‣Is the Department's research acknowledged and visible outside the Department? Rewards and awards

A few faculty members have been able to excel in their research goals. The DAB aspires to engage in high quality research but due to research fund shortages it is difficult to realistically achieve its set goals. Especially, the young and recently appointed faculty members, unless they are supported by internal funds for a while, they will be reduced to good teachers with poor publication output in a few years, due to difficulties in securing independent external research funding. Therefore, as mentioned before, the Departmental council should seek more support from central funds in order

to maintain their potentials until better opportunities arise and optimize use of resources towards that goal.

Several faculty members are internationally known and visible, as judged by invitations to review manuscripts for peer-review journals, membership in journal editorial boards, and organization of conferences.

The faculty has seven patents awarded to the Laboratory of Plant Physiology and Morphology (6) and Enzymology (1).

IMPROVEMENT

- Improvements in research proposed by the Department, if necessary
- Initiatives in this direction undertaken by the Department

A central move to improve research conditions at the Department is (a) to consolidate research in one functional building and reduce the geographical dispersion of the different laboratories and (b) to introduce the scheme of start-up funding for newly elected and appointed faculty members for all ranks. Currently, some faculty members do not even have a private office space for themselves, their students, and their postdocs. This is totally unacceptable.

Similarly, another unacceptable situation is when PhD students pursue their research with no stipend. Every effort should be made, including reaching out to the society and industry, for obtaining scholarships and other research support (corporate philanthropy).

GENERAL COMMENTS

Despite a slightly mixed picture, research is of high standards and internationally competitive. More effort should be made to maximize the use of human and laboratory resources.

D. All Other Services

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

APPROACH

- How does the Department view the various services provided to the members of the academic community (teaching staff, students)
- Does the Department have a policy to simplify administrative procedures? Are most procedures processed electronically?
- Does the Department have a policy to increase student presence on Campus?

There was a general feeling among the members of the EEC that delays in the purchasing of consumables and other materials are compromising research in the Department.

Faculty members were generally satisfied with the secretariat assistance at all levels. Moreover, the library services are also good, including remote access to online journals.

Finally, it was obvious that the Departmental buildings need basic maintenance for repairs and damage prevention.

IMPLEMENTATION

- Organization and infrastructure of the Department's administration (e.g. secretariat of the Department)
- Form and function of academic services and infrastructure for students (e.g. library, PCs and free internet access, student counseling, athletic- cultural activity etc.)

In addition to what is written in the previous section, the EEC realized there is no formal mechanism for continuous student academic counseling. This is a significant drawback and must be remedied as soon as possible. The EEC recommends that every student must have an academic advisor, who advises on career goals and directions, enrollment in classes, etc.

In general, infrastructures are of high standard while the location and structure of the AUA is quite unique and should be clearly recognized as an asset.

RESULTS

- Are administrative and other services adequate and functional?
- How does the Department view the particular results?

They are adequate. Specific recommendations have been made throughout.

IMPROVEMENT

- Has the Department identified ways and methods to improve the services provided?
- Initiatives undertaken in this direction

Overall, there is a clear perception of ways to improve services provided.

Collaboration with social, cultural and production organizations

Please, comment on quality, originality and significance of the Department's initiatives

Some faculty members are involved in culture and outreach initiatives. Also, there are occasional dedicated events for interfacing with schools, industries and other stakeholders. The University's Museum and Historical Archives are a remarkable resource. The publication of the quarterly magazine "Triptolemos" constitutes a valuable vehicle for maintaining and expanding outreach to society, including the Department's and AUA's alumni.

GENERAL COMMENTS

The infrastructure and location of campus should be appreciated as a value-added asset and better promoted for outreach and other activities.

E. Strategic Planning, Perspectives for Improvement and Dealing with Potential Inhibiting Factors

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

Please, comment on the Department's:

- Potential inhibiting factors at State, Institutional and Departmental level, and proposals on ways to overcome them
- Short-, medium- and long-term goals
- Plan and actions for improvement by the Department/Academic Unit
- Long-term actions proposed by the Department

The inhibiting factors and the parameters that pose obstacles in the development of the Department have been discussed throughout; these are mainly related to inadequate funding and lack of space. There are measures in progress for short term remedying the space problem but it is unpredictable how the research funding will be addressed in the following years. Some recommendations by the EEC are provided below.

GENERAL COMMENTS

A long-term planning and vision for improvement might be necessary to anticipate forthcoming changes at the national and international levels.

F. Final Conclusions and recommendations of the EEC

For each particular matter, please distinguish between under- and post-graduate levels, if necessary.

- The EEC recommends the following:

1. Tuition fees for postgraduate students (MSc students), which may be used in supporting PhD students in the form of scholarship funds and/or funding research activities.
2. Voluntary student work on campus (academic and non-academic), thus releasing University money, which could be used elsewhere.
3. Graffitti on the walls should be removed and University property must be respected and its image should not be mired by those; the AUA is uniquely endowed with a great campus and location, both valuable assets.

Conclusions and recommendations of the EEC on:

- the development of the Department to this date and its present situation, including explicit comments on good practices and weaknesses identified through the External Evaluation process and recommendations for improvement

The Department should continue the hiring of excellent candidates, which add value to itself and the University as a whole.

- the Department's readiness and capability to change/improve
- the Department's quality assurance

It is very important that the Department has obtained diploma certification and secured the professional rights of their graduates, recognizing their qualifications to work in various capacities. Their professional rights enable them to seek positions in the public and private sectors.

The EEC was convinced that the Department has some well established and some promising faculty members at all ranks who are willing to continue investing their share in the curriculum and in the research activities of the Department. There is readiness and there are capabilities. Based on the very nature of the DAB and its goals, the Department should try and guide more graduates towards the business sector in agricultural and other bioeconomy activities.

Based on data provided by the Department, faculty members have engaged in grant writing to different extents, although the average preparation of two proposals per year per faculty member is not particularly high.

Despite the genuine efforts of all faculty members to excel under these difficult circumstances of the economy, some faculty members were more productive than others, having earned a name of their own internationally, mainly through high-impact publications and participation in important international activities.

Finally, further extroversion and engagement into collaborations for grant applications (EU FP7, Interreg, Mediterranean grants etc.) should be encouraged. To this effect, the University's Research Committee and Liaison Office should take a more active role in assisting the faculty members to identify funding opportunities and prepare effective grant proposals.

In addition, we make the following recommendations for further improving of the teaching and research abilities of the DAB:

1. The Department should appoint a 3-member committee to evaluate every two years the content of the various courses offered by the DAB to ensure that all of them are updated and remain current with the scientific advancements.
2. The first three years (six semesters) of the curriculum should be reduced by one quarter in order to allow more time for electives.
3. All the courses might be evaluated by the students at the end of the semester and the evaluation results should be posted on the web in order for the students to see the final results of the evaluation. In addition the evaluation form should contain space for student comments.
4. The Department should offer a course on plant genetics that will include teaching of *Arabidopsis* and corn genetics, plant breeding and applications of genomics on plant breeding. A laboratory should also be offered. The teaching of *Arabidopsis* genetics (theory and practice) is of paramount importance because major advances in plant sciences over the last 30 years were due to the introduction of *Arabidopsis* as a model plant organism. This course can be included in the curriculum by reducing, e.g., the teaching of population genetics, which is highly extensive.
5. The DAB should offer two elective courses, one on prokaryotic genetics (*E.coli* and *photosynthetic bacteria/algae*) and another on the genetics of model organisms (*Drosophila, C elegans, zebrafish, Arapidopsis and mouse).* The laboratories of plant physiology/morphology/ biochemistry should include exercises with mutants of *Arabidopsis* and corn. The lectures of these courses should include the teaching of the use of *Arabidopsis* mutants in advancing our knowledge of Plant Anatomy/Morphology, Plant Physiology and Biochemistry.
6. The state should invest in the construction of a new state-of-the-art greenhouse with separate rooms for growing different plant species, currently missing, for the research needs of the Department. This greenhouse can be used by the other Departments of the AUA.
7. The Department should focus on hiring new faculty on various aspects of plant and microbial biology and avoid the hiring of animal biologists. The focus of the Department should be on plant biology and plant biotechnology. The Department should maintain the broad spectrum of courses offered. This is one of the great strengths of DAB. The teaching of Mathematics, Physics and Chemistry during the first two years of the curriculum should be maintained because these three disciplines are becoming an integral part of Plant Biology and Biology in general. Biology is becoming a more quantitative science. For example, Modeling of plant growth and development requires deep knowledge of these disciplines.

8. The Department should establish an annual seminar series to be attended by the faculty and students. In addition, the various laboratories should have group meetings to discuss their progress on various aspects of their activities. This will greatly enhance the interdepartmental communication and strongly benefit the training of the students.
9. The Department should consider establishing a 4-member advisory committee with prominent plant biology and biotechnology experts from abroad and from the Greek mainland. This committee has the potential to help the DAB to formulate its long-term goals.
10. The DAB and the University should consider combining the Laboratory of plant pathology (currently within the Department of Plant Production Science) with the DAB. This will be beneficial to both because plant pathology is a major part of plant biology, which is the focus of DAB.
11. The Department should seriously consider housing all its laboratories within the same building, instead of three separate ones. This will greatly enhance the interdepartmental communication and benefit the teaching of both under- and post-graduate students.
12. The Department should enhance the safety of all laboratory spaces. Ventilation should be greatly improved as well as procedures for the disposal of the chemicals used. The disposal of chemicals in the sinks should not be allowed. Old computers and monitors not in use should be removed from the premises and recycled.
13. The Department should allow the post-graduate students to rotate in other laboratories.
14. The DAB and the AUA in general should improve the bureaucratic procedures for the students in order to improve the everyday student life.
15. We recommend that the lecturer rank should be eliminated and be converted to postdocs. Each assistant professor should be assigned a defined laboratory space and carry out his/her research program independently.
16. The major problem regarding the research productivity of this and other Departments in the Greek universities is the availability of constant, predictable funding streams: we recommend that the state establishes a funding agency with an annual budget and the various PIs receive grants competitively.
17. We recommend that the space be distributed relatively evenly depending on the amount of funding and productivity.

The Members of the Committee

AGRICULTURAL UNIVERSITY OF ATHENS
DEPARTMENT OF AGRICULTURAL BIOTECHNOLOGY

Dr. Christos Ouzounis
King's College London, United Kingdom

Dr. Spyridon Agathos
University of Louvain, Louvain, Belgium

Dr. Mattheos Koffas
Rensselaer Polytechnic Institute, New York, U.S.A.

Dr. Anastasios Papageorgiou
University of Turku, Turku, Finland

Dr. Athanassios Theologis
University of Berkeley, San Francisco, U.S.A.