**DEVELOPMENT OF DOCTORAL EDUCATION**

**BASED ON HIGH LEVEL RESEARCH**

PREVIOUS TWINNING MISSION conducted by Professor Mati Heidmets and Karl-Erik Michelsen: *No time should be wasted, because scientific environment today is challenged by fundamental changes in society, economy and environment. Hence, the* ***capability to produce new knowledge*** *is and will be tremendously valuable asset and it cannot be replaced by transfer of knowledge or any other means*.

NIZAMI project: *There is an* ***urgent need*** *for Azerbaijan universities* ***to revise the rules and content of organizing doctoral studies in Azerbaijan within the Bologna process*** *documents in terms of their consistency, especially in ensuring science and research provisions in relevance with EU standards, to fulfill the students' mobility - one of the basic provisions of Bologna process.*

A. OVERVIEW OF THE CURRENT SITUATION FOCUSING ON MAIN AREAS OF IMPROVEMENT

1. Functioning of the system:

* Currently the doctoral education in Azerbaijan is too fragmented and provided by very diverse types of institutions. In 2015, 116 institutions were offering PhD studies. Academy of Sciences employs more than 11 000 staff members and additionally there are 53 universities (21 of them offering PhD studies) and several research institutions. In 2015, there were 145 organisations carrying out research.
* There is a lack of research infrastructure and support services.
* There are several governmental institutions that govern and micro-manage universities. This creates overlapping activities that eat up scarce resources. Higher attestation commission has strong powers to control dissertation process and to provide diplomas.
* Only about 10% of PhD students graduate in time.

2. Human resources:

* The heterogeneous system of research results in-efficient use of financial and human resources. Salaries are low and PhD studies are also suffering from low status. Universities and Academy of Science have difficulties in attracting best talents and brains.
* Supervisors for PhD candidates must have Doctor of Science degree (3.19). This is an outdated requirement, because about 70% of potential supervisors are older than 65 (2014 total 2510 academic staff members having Doctor of Science degree and involved in research, total number of persons involved in doctoral studies 2014 – around 3000)

3. Structure of doctoral programmes

* The system of two level doctoral degrees, PhD and Doctor of Sciences, is not in accordance with Bologna principles and doesn’t have a clear reasoning.
* PhD programs have no clear structure and don’t use credit system.
* For the level of Doctor of Sciences there is no “study programme” – this consists of research conducted by an academic professional individually or in a research group, comparable with the work of the post-doctoral researcher. Thus, it should be considered as the continuation of the academic career rather than part of formal education.

4. Internationalization

* There is weak international component in the PhD studies, involvement of foreign scientists/professors in teaching process, research projects or as co-supervisors is not common
* Dissertations are written in the form of monograph instead of articles in pre-reviewed international journals. Students (and the supervisors) publish mostly in national language.
* There is no free access to electronic databases and foreign scientific journals.
* Very few doctoral students participate in foreign exchange programs.
* Doctoral studies don’t provide a doctoral candidate with the skills of acting in an international work and study environment on their own and develop the ability to express themselves in their field of specialisation in at least one foreign language both in writing as well as orally.
* Recognition of doctoral qualifications from foreign countries in order to apply for the position of the professor is not possible (?)

B. RECOMMENDATIONS

1. A precondition for doctoral education should be high level research capacity and internationally recognised research output of the institution in the area/specialty of the concrete doctoral programme. In order to define institutions eligible for offering doctoral studies, first, **the evaluation of research output and capacity is needed**.

Training of high level researchers is currently done in too many institutions (116!). Therefore, we find it necessary that doctoral programs should be concentrated in the large and well equipped universities that have passed rigorous quality assurance evaluations. Quality assurance of doctoral education has been “outcome-based” (provided by the High Attestation Committee), there are no strict requirements regarding the scope, level and capacity of research for opening/developing a doctoral programme.

An example of assessment criteria for research evaluation can be found in Annex.

1. **Criteria for research universities should include criteria for quality of research as well as quality of educational process**, bearing in mind the main goal of integrating research and education. Publishing in High Impact Journals shall not replace but support student centred and learning outcome based teaching and learning.
2. **Cooperation between universities and research institutes** of the Academy of Sciences and other’s needs to be enhanced and motivated with the means of funding. Higher education and research in the Republic of Azerbaijan should be able to compete at the global level, not nationally. Building strong research universities by bringing together the best talents and brains and high level infrastructure would make it possible.
3. The **differentiation** should be made between **PhD** as doctoral degree acquired after the completion of doctoral studies, and **Doctor of Sciences** as a result of an individual research effort. Inherited from the Soviet system, candidate for Doctor of Sciences can partly be compared with the post-doctoral researcher in westerns countries, but it should be considered as the continuation of the academic career rather than part of formal education.
4. The **academic content** of the doctoral programs should be re-design to assist PhD students to conduct high quality research. For instance, current mandatory course on philosophy should be replaced by courses that enhance skills in research design, methodology and writing a peer review article in English language.

Doctoral studies should also provide students with management, teamwork and project development skills as well as the knowledge of legal protection of intellectual property.

1. Dissertation work should evolve from monographs into **article based dissertations**. At least four peer-review articles + intellectually stimulating summary is needed to complete doctoral studies. Article based dissertation connects PhD students in the international scientific networks. In addition, objective peer review process validates dissertations and improves supervision.
2. Universities should be given full **autonomy in scientific matters**. They are the place where scientific research is done in the future. This process requires quality assurance system that will evaluate scientific functions in the universities. Those institutions that pass the rigorous evaluation should be granted rights to design and conduct programs that aim at BA, MA and also PhD degrees. **High Attestation Commission** could be reorganized into research evaluation **authority offering regular research evaluation procedures** rather than re-checking the quality of every single dissertation.
3. Research infrastructure and environment should be improved by providing all PhD students and professional researchers a free access to electronic databases and foreign publications. In addition new laboratory and research facilities should be built and contracts with other countries signed to get access to national and transnational research infrastructure.
4. PhD students should have good and **open access to international exchange programs** and at least six months training abroad should be required from all students. In addition supervision of PhD studies should be given to domestic as well as international scientific experts.
5. To promote the internationalization of doctoral programs there should be considerable investments in **improving English language skills** of students and staff. Additionally **foreign experts** need to be invited to serve **as opponents and members of the defence panels**.

**ANNEX: Description of assessment criteria and rating scale**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Scientific impact of research** | **Sustainability and potential of research** | **Societal importance of research** |
| Very good | Most of the R&D outcomes are of high international standard: the results generate considerable international interest in the field. Publications have been issued by leading international publishers and/or in highly recognized international journals. The number of publications per research staff member and the bibliometric indicators of the publications indicate consistently high level of R&D. Additional information provided by the institution confirm the great impact of the R&D. | The organization and management of R&D are clear and effective and take into account the specifics of the field. Measures for assuring funding in the field and the amount and structure of funding as well as the gender, age, and ethnic/national diversity among staff are testimony to the sustainability of the R&D from a future perspective.  The institution has a clear and focused vision in relation to the development of the field which strengthens the sustainability and potential of the field. Research directions have clear potential from a scientific, socioeconomic, and/or environmental perspective.  Infrastructure is in very good condition and provides very good conditions for R&D in the field and for doctoral studies (in the case of universities).  (For universities) The R&D on which all of the doctoral programmes in the field are based, is at high international level. | R&D in the field takes into account societal development trends and needs (e.g. through research in vital issues or commission applied research, research staff participating in external development and decision-making committees, significant societal developments based on the results of R&D, etc.). Research staff in the corresponding field is proactively involved in societally and globally important research, raising issues and initiating discussions.  The institution clearly values, in its R&D management, the role and responsibility it has in society and takes into account the societal importance of its R&D. |
| Good | Majority of the R&D outcomes are of good international standard: the results generate international interest in the field. Publications have been issued by internationally recognized publishers and/or in internationally recognised journals. The number of high-level publications per research staff member indicates some disparity in the level of R&D within research directions and/or structural units.  Additional information provided by the institution confirm the scientific impact of R&D. | The organization and management of R&D are generally clear and effective and take into account the specifics of the field where possible. Measures for assuring funding in the field, the amount of funding as well as the composition of staff are testimony to the sustainability of the R&D from the future perspective, however it may be necessary to implement measures to strengthen the structure of funding and the diversity among staff.  The institution has a clear vision of strengths and development needs of the corresponding R&D field and the desire to strengthen the potential of the field.  Research directions from a scientific, socioeconomic, and/or environmental perspective are at times clear but also at times unapparent and require more attention.  Infrastructure is in good condition and provides good conditions for R&D in the field and for doctoral studies (in the case of universities).  (For universities) The R&D on which all of the doctoral programmes in the field are based, is generally at good or very good international level but uneven across different programmes. (In this case, the committee indicates which programmes are at satisfactory level). | Various R&D directions in the field take into account societal development trends and needs (e.g., through research in vital issues or commission applied research, research staff participating in external development and decision-making committees, significant societal developments based on the results of R&D, etc.).  The choice of research in the field is partly based on societally and globally important topics. Discussion on vital issues is initiated.  The institution values the role and responsibility of its R&D in society and it endeavours to align its activities with the needs of society and takes into account the societal importance of its R&D. |
| Satisfactory | The R&D outcomes are in general of satisfactory international standard: they provide international interest in certain areas. Publications have been issued by international publishers or recognised by domestic publishers or in domestic scientific journals. Research staff members are active in publication of outcomes but the level of publication is very uneven across staff members and/or sub-fields. | The organization and management of R&D are generally clear, however there are areas that require more focused reflection, including opportunities for taking into account the specifics of the field. Measures for assuring funding in the field and the amount of funding as well as the composition of staff permit conducting R&D and doctoral studies, however require significant effort from the institution to ensure sustainability and strengthen the potential from the future perspective.  Institution has room for improvement in defining strengths and development needs of the corresponding R&D field.  Research direction potential from a scientific, socioeconomic, and/or environmental perspective is at times unapparent and requires greater attention. Some directions of research are exhausted/becoming exhausted and there have been no demonstrable efforts in expanding these.  Infrastructure is in satisfactory condition for carrying out research and providing doctoral studies (in the case of universities) but improvement is needed to increase quality.  (For universities) The R&D on which most of the doctoral programmes in the field are based, is at least at a satisfactory international level, however the level of R&D in case of some programmes is unsatisfactory. (In this case, the committee indicates which programmes are at an unsatisfactory level) or the variation in levels is so large across programmes that a rating of “good” cannot be given. | Development of R&D in some directions takes into account societal development trends and needs (e.g., through research in vital issues or commission applied research, research staff participating in external development and decision-making committees, etc.).  The direction of R&D at the institution deals with its role and responsibility in society and takes into account the societal importance of its R&D in some aspects. |
| Unsatisfactory | Satisfactory R&D at an international level is practically non-existent or few high-level outcomes do not provide evidence of being at satisfactory level overall. There is a failure to implement measures to raise the level of research in the field. | Funding in the field is very uneven or insufficient. The composition of R&D staff does not indicate sustainability of the R&D from a future perspective. R&D development lacks potential from a research and/or socioeconomic perspective.  Institution has not been able to define clear strengths and development needs of corresponding R&D field.  Research direction potential from a scientific, socioeconomic, and/or environmental perspective is exhausted/becoming exhausted in various research directions; significant restructuring is necessary in order to generate further potential.  Infrastructure is in very uneven or in poor condition (does not meet current standards in the field in large part, or depends on another institution’s infrastructure in large part).  (For universities) The R&D on which most of the doctoral programmes in the field are based, is at a weak international level. | The institution lacks a clear and focused approach of development of the corresponding R&D field according to societal development trends and needs, and lacks an understanding of consideration of these aspects. Societal impact of R&D is not being evaluated. |
| Areas of special note | *Specified by the evaluation committee as appropriate* | *Specified by the evaluation committee as appropriate* | *Specified by the evaluation committee as appropriate* |
| Areas in need of improvement | *Specified by the evaluation committee as appropriate* | *Specified by the evaluation committee as appropriate* | *Specified by the evaluation committee as appropriate* |