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Developing Interdisciplinary Postgraduate Programmes and Strengthening Research Networks in Geoinformation Technologies in Armenia and Kyrgyzstan

Erasmus+ Capacity Building in Higher Education

Education, Audiovisual and Culture Executive Agency

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Curriculum development workshop



Three overarching concepts

- doctoral education has a particular place in the European Research Area and the European Higher Education Area. It rests on the practice of research, which makes it fundamentally different from the first and second cycles
 - doctoral candidates must be allowed independence and flexibility to grow and develop.
 - doctoral education must be developed by autonomous and accountable institutions taking responsibility to cultivate the research mindset. Institutions need flexible regulation to create special structures and instruments and continue advancing European doctoral education.
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**Conclusions and Recommendations from the Bologna Seminar on
“Doctoral Programmes for the European Knowledge Society”
(Salzburg, 3-5 February 2005)**

- i. **The core component of doctoral training is the advancement of knowledge through original research.** At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.
- ii. **Embedding in institutional strategies and policies:** universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities.
- iii. **The importance of diversity:** the rich diversity of doctoral programmes in Europe – including joint doctorates – is a strength which has to be underpinned by quality and sound practice.
- iv. **Doctoral candidates as early stage researchers:** should be recognized as professionals – with commensurate rights – who make a key contribution to the creation of new knowledge.
- v. **The crucial role of supervision and assessment:** in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).
- vi. **Achieving critical mass:** Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries. These range from graduate schools in major universities to international, national and regional collaboration between universities.
- vii. **Duration:** doctoral programmes should operate within an appropriate time duration (three to four years full-time as a rule).
- viii. **The promotion of innovative structures:** to meet the challenge of interdisciplinary training and the development of transferable skills.
- ix. **Increasing mobility:** Doctoral programmes should seek to offer geographical as well as interdisciplinary and intersectoral mobility and international collaboration within an integrated framework of cooperation between universities and other partners.
- x. **Ensuring appropriate funding:** the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding



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SALZBURG II RECOMMENDATIONS

EUROPEAN UNIVERSITIES' ACHIEVEMENTS
SINCE 2005 IN IMPLEMENTING
THE SALZBURG PRINCIPLES



Clues for success

Critical mass and critical diversity

Recruitment, admission and status

Supervision

Outcomes

Career development

Credits

Quality and accountability

Internationalisation



2.1. Critical mass and critical diversity

Doctoral education is dependent on the research environment. Institutions must develop a **critical mass and diversity of research** in order to offer high quality doctoral education. Critical mass does not necessarily mean a large number of researchers, but rather the quality of the research. In line with the sixth Salzburg Principle, Europe's universities have developed diverse strategies to assure critical mass and diversity, building their areas of strength through focused research strategies and engaging in larger research networks, collaborations or regional clusters.



2.2. Recruitment, admission and status

Structured programmes should **develop recruitment strategies that correspond to their particular mission and profile**. Recruitment strategies should be connected to explicit outcomes, identifying clear profiles of the candidates wanted. Such profiles should build on the parity of esteem of a range of different qualities and ensure equality of opportunity. In this manner, recruitment policies could take into account criteria such as international recruitment, gender equality, social background or different age groups. Recruitment should value **the research potential of the candidates over past performance and above all the candidates' potential to succeed in the programme to which they are being admitted**.



2.3. Supervision

As stressed in the fifth Salzburg Principle, supervision plays a crucial role. **Supervision must be a collective effort** with clearly defined and written responsibilities of the main supervisor, supervisory team, doctoral candidate, doctoral school, research group and the institution, leaving room for the individual development of the doctoral candidate. **Providing professional development to supervisors is an institutional responsibility**, whether organised through formal training or informal sharing of experiences among staff. Developing a common **supervision culture** shared by supervisors, doctoral school leaders and doctoral candidates must be a priority for doctoral schools. **Supervisors must be active researchers.**



2.4. Outcomes

The main outcome of doctoral education are the early stage researchers and their contribution to society through knowledge, competences and skills learnt by undertaking research, as well as awareness and openness towards other disciplines. The outcome of their research must **testify to the originality of the research and be suitable for dissemination within the scientific community.**

Verb wheel based on the revised Bloom's Taxonomy



- Domain
- Verb (measurable, observable)
- Learner artefact/evidence

 Lower order

 Higher order

Remade by Dr Ashley Tan
 Twitter: @ashley



Reference: <http://bit.ly/oldbtref>
 This resource: <http://bit.ly/newbtref>

BLOOM'S TAXONOMY DIGITAL PLANNING VERBS

REMEMBERING



Copying
Defining
Finding
Locating
Quoting
Listening
Googling
Repeating
Retrieving
Outlining
Highlighting
Memorizing
Networking
Searching
Identifying
Selecting
Tabulating
Duplicating
Matching
Bookmarking
Bullet-pointing

UNDERSTANDING



Annotating
Tweeting
Associating
Tagging
Summarizing
Relating
Categorizing
Paraphrasing
Predicting
Comparing
Contrasting
Commenting
Journaling
Interpreting
Grouping
Inferring
Estimating
Extending
Gathering
Exemplifying
Expressing

APPLYING



Acting out
Articulate
Reenact
Loading
Choosing
Determining
Displaying
Judging
Executing
Examining
Implementing
Sketching
Experimenting
Hacking
Interviewing
Painting
Preparing
Playing
Integrating
Presenting
Charting

ANALYZING



Calculating
Categorizing
Breaking Down
Correlating
Deconstructing
Linking
Mashing
Mind-Mapping
Organizing
Appraising
Advertising
Dividing
Deducing
Distinguishing
Illustrating
Questioning
Structuring
Integrating
Attributing
Estimating
Explaining

EVALUATING



Arguing
Validating
Testing
Scoring
Assessing
Criticizing
Commenting
Debating
Defending
Detecting
Experimenting
Grading
Hypothesizing
Measuring
Moderating
Posting
Predicting
Rating
Reflecting
Reviewing
Editorializing

CREATING



Blogging
Building
Animating
Adapting
Collaborating
Composing
Directing
Devising
Podcasting
Wiki Building
Writing
Filming
Programming
Simulating
Role Playing
Solving
Mixing
Facilitating
Managing
Negotiating
Leading



Three main components:

Knowledge and understanding of relevant academic disciplines, psychomotor elements, interpersonal skills, moral values.

Skills to perform the psychomotor techniques, interact with members of the role.

Competences that result in a knowledge and commitment to professionalism, a willingness to play the role in a professional manner.



	<i>Knowledge</i>	<i>Skills</i>	<i>Competence</i>
Level 8	<ul style="list-style-type: none">• Must have knowledge at the highest international level within the field of research.• Must have made a significant contribution to the development of new knowledge and understanding in the field of research and on the basis of scientific studies.	<ul style="list-style-type: none">• Must master the scientific theories, methods and tools as well as other skills connected with research and development within the area.• Must be able to analyse, evaluate and develop new ideas, including designing and developing new techniques and skills in the field of study.• Must be able to participate in international discussions in the field of study and to disseminate research results and progress to a wider public.	<ul style="list-style-type: none">• Must be able to organise and conduct research and development tasks in complex and unpredictable contexts.• Must be able independently to initiate and enter into national and international cooperation on research and development with scientific integrity.• Must be able independently to initiate research and development projects and through this generate new knowledge and new skills that develop the field of research.



— Level 6 - learning outcomes

Knowledge

Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles

Skills

Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study

Responsibility and autonomy

Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups

— Level 7 - learning outcomes

Knowledge

Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research

Critical awareness of knowledge issues in a field and at the interface between different fields

Skills

Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields

Responsibility and autonomy

Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams



2.5. Career development

Career support for doctoral candidates must take into account individual goals and motivations and acknowledge the wide range of careers for doctorate holders.

While the doctoral candidate is responsible for their career choices given the situation on the labour market, **it is the institution's responsibility to provide support structures for professional development. Offering training in transferable skills, including understanding the ethics of research, is central,** and should be a priority for doctoral schools and programmes. Professional development of doctoral candidates includes **awareness about skills attained through doing research** as well as of the wide range of career choices for doctorate holders. Building ties to the other sectors contributes to bridging the communication gap with potential employers and recruiters.



2.6. Credits

Applying the **credit system** developed for cohorts of students in the first and second cycles **is not a necessary precondition for establishing successful doctoral programmes**. Some universities consider credits useful for the taught components of doctoral education, especially in cross-institutional (joint) doctoral programmes. Credits, however, do not make sense when measuring the research component or its associated dissemination outputs. Applied wrongly, rigid credit requirements can be detrimental to the development of independent research professionals. High quality doctoral education needs a stimulating research environment driven by research enthusiasm, curiosity and creativity, not motivated by the collection of credits.



2.7. Quality and accountability

It is necessary to develop **specific systems for quality assurance in doctoral education** based on the diverse institutional missions and, crucially, **linked to the institutional research strategy**. For this reason, there is a strong link between the assessment of the research of the institution and the assessment of the research environments that form the basis of doctoral education. Assessment of the **academic quality of doctoral education should be based on peer review** and be sensitive to disciplinary differences.

In order to be accountable for the quality of doctoral programmes, institutions should **develop indicators based on institutional priorities** such as individual progression, net research time, completion rate, transferable skills, career tracking and dissemination of research results for early stage researchers, taking into consideration the professional development of the researcher as well as the progress of the research project.



2.8. Internationalisation

Internationalisation strategies should be a tool in increasing the quality in doctoral education and in developing institutional research capacity. Internationalisation in doctoral education is understood and interpreted in different ways, ranking **from internationalisation at home** (using the international profile of the home institution such as international doctoral candidates, staff, events and guest researchers), **collaborative doctoral programmes** (with individual mobility – such as co-tutelle) to **international joint doctoral programmes** (joint, integrated curricula, joint committees and juries, and the joint degree). As stressed in the ninth Salzburg Principle, doctoral education should include the possibility for mobility experiences. The choice among these different models of internationalisation must be coherent with the research strategy of the institution and the individual needs of the doctoral candidate. **The mobility of doctoral candidates must be driven by the research project.**



Obstacles

Funding

Autonomy

Legal framework

Intersectoral collaboration

- New impulses for the further development of the HEI and its study programmes
- Opportunity to establish new professional contacts at the international level
- Enhancement of the perception and reputation of the offered study programmes and the institution as a whole
- Recognition of qualifications in European countries
- Greater opportunities for academic mobility
- And much more

- As an external quality assurance instrument, the international programme accreditation aims both at assessing the study programmes' existing quality and at recommending improvements. Accountability and enhancement are at the core of the accreditation.
- The accreditation is performed by independent external peer-review experts who evaluate and assess the study programmes against a specific set of criteria.
- The ACQUIN accreditation procedures fully comply with and are based on the ***Standards and Guidelines for Quality Assurance in the European Higher Education Area*** (ESG).



Conclusion of a bilateral agreement

Workshop on self-assessment report preparation

Preparation of a self-assessment report by the HEI

Discussions between the expert group and the HEI stakeholders

Drafting of the expert report

Submission of the report to the HEI for the opportunity to compose a feedback statement

Accreditation decision by the ACQUIN Accreditation Commission

Awarding of the accreditation certificates with the ACQUIN seal of quality

The study programme quality assurance and continuous development are the cornerstones of any programme accreditation procedure.

Over the course of the evaluations, the applicable mechanisms and structures are assessed at programme, faculty, and institution levels.

- Bundled approach
- Differentiation of Bachelor, Master, PhD study programmes
- ESG application in the national context
- “Putting yourselves in the shoes of others”

- The self-assessment report and supplementary materials are to be provided by the institution in English
- The international accreditation project managers review the first draft(s) of the report and, where appropriate, provide feedback and commentary
- The self-assessment report should follow the structure of the ESG
- Informative AND concise
- Statistical information in context
- Graphs, tables, illustrations, etc.
- The ACQUIN guidelines outline the framework for compiling the self-assessment report

Self-Assessment Report Structure: Cover Sheet

Location	
Date of introduction	
Faculty/department	
Standard period of study (semesters)	
Number of ECTS credits	
Number of study places	
Number of PhD students currently enrolled	
Average number of PhDs per year	
Target group(s)	
Admission requirements	
Form of study	
Tuition fee	

Self-Assessment Report Structure: Overview of the Curriculum (illustration)

1st semester	Methods in Biomedical Science 6 ECTS P/S	Data Analysis and Bioinformatics 6 ECTS P/S	Biolmaging 6 ECTS P/S	Model Organisms 6 ECTS P/S	Current topics in Biomedical Science 6 ECTS L/S
2nd semester	Main topic (1 of 2) Epigenetics • Molecular Microbiology 9 ECTS L/P/S	Research practical (1 of 2) Epigenetics • Molecular Microbiology 12 ECTS RP/S	Interdisciplinary Module 9 ECTS L/P/S		Transferable Skills 9 ECTS L/P/S
3rd semester	Main topic (1 of 3) Neurosciences • Molecular oncology • Cardio & Lung Research 9 ECTS L/P/S	Research practical (1 of 3) Neurosciences • Molecular oncology • Cardio & Lung Research 12 ECTS RP/S	Transferable Skills 9 ECTS L/P/S		
4th semester	Master Module 30 ECTS Thesis/S/C/D				
	Mandatory module	Elective module	Colloquium, Disputation, Lecture, Practical course, Research, Seminar		

1.1: Policy for quality assurance

- Institutions should have a policy for quality assurance that is made public and forms part of their strategic management. Internal stakeholders should develop and implement this policy through appropriate structures and processes while involving external stakeholders.

Official and published documents that define the HEI's QA system, both internally and externally.

1.2: Design and approval of programmes

- Institutions should have processes for the design and approval of their programmes. The programmes should be designed so that they meet the objectives set for them, including the intended learning outcomes. The qualification resulting from a programme should be clearly specified and communicated and refer to the correct level of the national qualifications framework for higher education and, consequently, to the Framework for Qualifications of the European Higher Education Area.

Guidelines for designing study programmes, learning outcomes matrix, curricula, syllabi, internship regulations, Diploma Supplement, etc.

1.3: Student-centred learning, teaching, and assessment

- Institutions should ensure that the programmes are delivered in a way that encourages students to take an active role in creating the learning process, and that the assessment of students reflects this approach.

Study and examination regulations, syllabi, blended learning concepts, etc.

1.4: Student admission, progression, recognition, and certification

- Institutions should consistently apply pre-defined and published regulations covering all phases of the student “life cycle”, e.g., student admission, progression, recognition, and certification.

Admission regulations, recognition regulations, mentoring/tutoring guidelines, graduation certification, Diploma Supplement, transcript of records, etc

1.5: Teaching staff

- Institutions should assure themselves of the competence of their teachers. They should apply fair and transparent processes for the recruitment and development of the staff.

Staff recruitment policy (including levels of competence and qualifications), staff development policy, overview of the faculty staff, etc.

1.6: Learning resources and student support

- Institutions should have appropriate funding for learning and teaching activities and ensure that adequate and readily accessible learning resources and student support are provided.

Overviews of infrastructure equipment, finances, IT infrastructure, library sources, study facilities, etc.

1.7: Information management

- Institutions should ensure that they collect, analyse and use relevant information for the effective management of their programmes and other activities.

Evaluation regulations, data collection policy, etc.

1.8: Public information

- Institutions should publish information about their activities, including programmes, which is clear, accurate, objective, up-to-date and readily accessible.

Information materials (e.g., flyer, website), annual reports, publicly accessible information on study programmes (e.g., admission criteria, learning outcomes, qualification awarded, teaching, learning, and assessment procedures, pass rates, learning opportunities, graduate employment information), etc.

1.9: On-going monitoring and periodic review of programmes

- Institutions should monitor and periodically review their programmes to ensure that they achieve the objectives set for them and respond to the needs of students and society. These reviews should lead to continuous improvement of the programme. Any action planned or taken as a result should be communicated to all those concerned.

QM policy, QA manual, QM report, evaluation regulations, etc.

1.10: Cyclical external quality assurance

- Institutions should undergo external quality assurance in line with the ESG on a cyclical basis.

Ditto.

- **Readability** -> volume of material and information, professional translation and layout (page and document numbering, abbreviations, references, PDF format)
- **Content** -> implementation of ESG, strengths and weaknesses, further development
- **Significance of the information** -> ratings, awards and medals of international or national importance and recognition
- **Brevity** -> avoidance of repetition of information
- **Traceability** -> corroboration of the information with examples (appendices)
- **Accuracy of the information** -> statistical data, figures always in relation
- **Topicality of the information** -> reference to a specific time period

- The expert group is nominated on the basis of the Guidelines for Nominating Experts and Compiling Expert Groups for Accreditation Procedures and the profile of the HEI and study programmes.
- The expert group consists of foreign experts: representatives of science, practice, and students.
- Experts are prepared for their role in the accreditation procedure by individual training or workshops and by an extended preliminary meeting and discussion with the programme manager of ACQUIN preceding the on-site visit/online discussions.

Conversations typically span over several days. They start with a preliminary internal discussion with all experts and the ACQUIN coordinator.

Subsequently, the expert group holds conversations with representatives of the HEI:

- the leadership
- administration staff
- management of doctoral schools
- supervisors and teaching staff
- PhD students and alumni
- Employers

The experts also get acquainted with the facilities and premises.

- The report contains information on the fulfilment of the assessment criteria as well as all identified positive and negative aspects of the doctoral programmes and teaching and learning processes based on the self-assessment report and extensive discussions.
- The expert report is provided to the HEI in English.
- The institution has the right to draft a statement of its opinion on the report before the accreditation decision is made.

In the assessment of each standard, peer experts distinguish between (full or substantial) compliance, partial compliance, and non-compliance. Depending on the level of fulfilment, the procedure of study programme accreditation can have three different results:

- Unconditional accreditation: Compliance with the standards
- Accreditation with conditions: Partial compliance with the standards
- Refusal of accreditation: Major irremediable non-compliance

The certificate is issued for a period of **six years**.





Accreditation in practice

It is important to keep an eye on the supervision of the research achievements of the students. How does the supervision take place? Do the students have enough time for research? How do the results flow into the design of courses? Is the workload appropriate for the program and is there adequate student support? What about international conferences? Is something like this encouraged? What financing options are there?

