AQAS
Agentur für Qualitätssicherung durch Akkreditierung von Studiengängen

Decision of the Accreditation Commission of AQAS

on the degree programme

- **Licenciate in Educational Science "Mathematics and Informatics"**

at the Alecu Russo Balti State University (Republic of Moldova)

Based on the report of the expert panel and the discussions of the Accreditation Commission in its 58th meeting on 23./24. February 2015, as well as in circulation procedure on 20. March 2015 the Accreditation Commission decides:

1. The Bachelors-level programme **"Mathematics and Informatics" (Licenciate in Educational Science)** offered by the **Alecu Russo Balti State University (Moldova)** is accredited according to the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).

   The accreditation is **conditional**.

2. The study programme essentially complies with the requirements defined by the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Qualifications Framework (EQF) in their current version. The required adjustments can be processed within a time period of nine months.

3. The conditions have to be fulfilled. The fulfilment of the conditions has to be documented and reported to AQAS no later then **30. November 2015**

4. The accreditation is given for the period of **five years** and is valid until **30. September 2020**.

Conditions:

1. It is necessary to describe the fundamental idea of the course program and to rewrite the documentation carefully. The concept of Informatics has to be clearly worked out in the general program outcomes to give future students a clear idea of the IT program of Balti State University.

2. The module handbook must be completed and descriptions the overall goal of the study program as well as every single course/module must be written in a competence oriented manner. It is necessary to document in module descriptions how software applications will be used in a course and in the program as a whole.

3. There has to be a clearly defined process how the update of the curriculum is organized involving the stakeholders.

The conditions were fulfilled within the given timescale.

The Accreditation Commission confirms the fulfilment of the conditions in it's decision of 22./23.02.2016.

The following **recommendations** are given for further improvement of the program:

1. Concerning curriculum:
    a. Lectures in Mathematics & Informatics and the respective didactics in the subject should give more insight into research.
    b. Active-participative methods in teaching mathematics should be strengthened. More independent learning, more group learning, and more project work should be offered.
    c. The university should present a plan how to combine the general course with the two subjects.
    d. A course in software engineering and project management should be included in the curriculum.
2. In the documentation of the program the overlapping of courses should be reduced.
3. Foreign language courses should be offered in a way that students can improve their language abilities more intense.
4. It should be documented how the evaluation of lectures takes place and how students are included in the process or quality improvement of courses. The evaluation should also include the aspect if the real workload of the students is in balance with the credits students can earn in a module.
5. The range of competence based exams should be broadened (oral, project/practical based, presentations).
6. There should be continuously strong efforts to increase the international mobility.
7. The documentation of staff resources should be updated.
8. It is recommended to document clearly software needs as well as hardware needs and to allocate a budget for software.
9. The university should focus the QM-system on the outcomes that are needed and how improvement measures can be reached. Based on the target a formal approach to collect and analyse the data provided by the QM-system could be implemented.

With regard to the reasons for this decision the Accreditation Commission refers to the attached assessment report.

Experts' Report

on the degree programme:

Licenciate in Education Science "Mathematics and Informatics"

offered by the Alecu Russo Balti State University

Visit to the University: 26./27. November 2014

Panel of Experts:

Prof. Dr. Ioan Bucataru	Faculty of Mathematics, Alexandru Ioan Cuza University, Iasi, Romania
Andrei Hohan	FiaTest, Bucharest, Romania (expert from professional field)
Frederic Menninger	Student of Financial Mathematics, University of Konstanz, Germany (student expert)
Prof. Dr. Michael Neubrand	Institute for Mathematics, Carl von Ossietzky University Oldenburg, Germany
Prof. Dr.-Ing. Frank Slomka	Institute of Embedded Systems / Real-Time Systems, University of Ulm, Germany

Coordinator:

Doris Herrmann / Ronny Heintze	AQAS e.V., Cologne, Germany

1. Introduction

This report results from the external review of the Licenciate in Education Science in Mathematics and Informatics programme offered by the Balti State University, Balti, Moldova. The review is based on the criteria that where developed jointly as part of a TEMPUS project under participation of the Ministry of Education of the Republic of Moldova. They are based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) that were developed by the European Association for Quality Assurance in Higher Education (ENQA) and presented to the Bologna Follow-Up group in 2005.

The University produced a Self Evaluation Report (SER). The accreditation procedure was officially initialized by a decision by the AQAS Accreditation Commission on 18./19. August 2014. The Accreditation Commission nominated the before mentioned expert panel and the University did not raise any objections against the composition of the panel.

After a review of the Self Evaluation Report on 26./27. November 2014 a site visit to the University took place. On site, the experts interviewed different stakeholders and consulted additional documentation and student work. The visit concluded with the presentation of the preliminary findings by the group of experts to the University representatives**.**

Alecu Russo Balti State University is a public institution, financed from the state budget, assigned as a structure of higher education in the Republic of Moldova that develops its activity according to the provisions of the Constitution of the Republic of Moldova. The academic structure of the Alecu Russo Balti State University counts four faculties and 13 chairs: the Faculty of Letters (Philology), Faculty of Real, Economic and Environmental Sciences, the Faculty of Educational Sciences, Psychology and Arts, and the Faculty of Law and Social Sciences.

The University has about 6000 students (undergraduates, Master students and PhD students) at 44 specialties and 26 specializations. The employees of the 13 specialized departments provide educational services in Romanian, Russian and at certain specialties, in English, German and French. Alecu Russo Balti State University organizes doctoral studies in eight specialties. The University Scientific Library, ranked by the Government of the Republic of Moldova as belonging to the highest category, has a book stock of about 290,700 titles in 1,013,293 copies (in 52 languages).

2. Profile / Outcomes of the Programme

A priority of Alecu Russo Balti State University is education, development and research in the area of Educational Sciences, ensuring the availability of qualified teaching staff for secondary and specialized secondary educational institutions. This long standing university tradition led to the development and existence of a Study Program for the general field of studies: Educational Sciences - professional training: Education and teacher training with the specialization Mathematics and Informatics. The goals and intended outcomes in the field of Education Sciences, the sphere of professional formation – Education and teachers' training at the specialty – Mathematics and Informatics are oriented towards the actual conditions in the Republic of Moldova. The program aims to train experienced didactic personnel for secondary and specialized secondary educational institutions. The combination of these two fields, mathematics and informatics is seen as successful due to the didactic and scientific features. Making use of the mathematic competencies it is possible to solve different problems in the sphere of science and technique, for exam-

ple, problems from the sphere of chemistry, biology, economy, engineering, etc. To solve problems in these fields mathematical modeling and computer use is required. Another argument to underline the benefit of simultaneous teaching of these two related specialties is the necessity to cover the requirements of labor market of didactic personnel and to simplify the procedure of graduates' job placements.

At the end of the program the graduates who will pass the licensed exam, will be given the title "Licentiate in Education Sciences". The owner of the licensed diploma will have the possibility to study at Magistracy and Institutions of Doctoral candidacy.

At the end of program the graduate will be able to:

- present knowledge and understanding of elementary mathematics and general informatics,
- explain the basic concepts on principles, theories and results of classical and modern mathematics, the architecture of computers and computer networks, purpose and basic functions of software systems and generic systems, and technologies of information and communication,
- understand and explain the sense of complex affirmations using mathematical symbols and language,
- apply general and field mathematical and informational knowledge during the process of educational training,
- reveal abilities of rational thinking, mathematical arguing, rigorous mathematical demonstration,
- present knowledge of classic and modern methods of teaching and research;
- solve mathematical problems similar to the already known,
- transfer problems formulated in a non-mathematical language in mathematical terms;
- show some mathematical affirmations, which are non identical to the already known, but are directly connected with them,
- solve problems from different mathematical fields, which demand a certain originality;
- present to public teaching/learning/evaluation activities in school framework applying adequate didactic strategies,
- improve continuously his/her professional qualification,
- use efficient procedures of selection and use of information.

The program is supposed to give the graduate the possibility to work as a teacher of mathematics and informatics at high schools, training centers, professional schools, as specialist of informatics at public organizations, NGOs, and information centers.

Experts' Evaluation

Alecu Russo Balti State University, founded 1945, is traditionally focused on teacher education. Mathematics is a classical subject, Informatics is relatively new. This focus with its long history is reflected in various observations during the visit:

(1) The program is notably broad, since it is intended for more the one purpose. It is a basis in the two subjects Mathematics & Informatics to become teachers in lower secondary schools ("Gymnasium"), and it lays foundations to continue the studies in the MA-programs for upper secondary teachers, for specialists in mathematics, and the MA- program in In-

formatics. The expert group appreciates this broad range of studies, however will also come to some suggestions to renew the curriculum.

(2) Apparently as kind of heritage from the teacher education orientation, Alecu Russo Balti State University also provides to the students some general courses in the humanities. This approach is valued by the expert group, too, but nevertheless the experts will give some hints concerning the further development of this part of the studies.

(3) A special quality of the Mathematics & Informatics program at Alecu Russo Balti State University seems to be the intensive contacts from the University into the schools, going far beyond the needs of the compulsory internships of the students.

Thus, the program as a whole seems well defined. However, some recommendations will come up when the experts look closer to the various content aspects of the curriculum. All suggestions may be achievable since Alecu Russo Balti State University has a very active quality control system which administers a lot of data and should be able to influence and assist the further development of the studies in Mathematics & Informatics. The circumstances of the general situation however are difficult. The university suffers from a certain decline in the number of students enrolling in the subjects Mathematics & Informatics. This is due to the demographic development in the country, but also due to the image of mathematics as being difficult and not so attractive. Alecu Russo Balti State University takes measures to improve the situation, e.g. training students before entering the university lectures is one attempt to make the start smoother, growing emphasis toward applied mathematics can be good for motivation, and visits of the university staff in schools may also help to get more students.

3. Curriculum

The admission to the study program „141.01 Mathematics and 141.02 Informatics" is made according to the Regulations on organization and admission to higher licensed education at Alecu Russo Balti State University. According to the mentioned regulations the admission is given based on a contest. The candidate selection happens on the basis of their school marks and field abilities in the chosen professional field.

The curricular structure of the study program corresponds to the framework plan for higher education (Order of ME no. 455 from June 03, 2011). The basic formational element is the course unit that is made in form of lectures, seminars, laboratory works, thesis, individual projects, and practical trainings.

The courses/modules are grouped into 6 types:

- a basic component;
- a component of abilities and general skills formation;
- a component of social and humanistic orientation;
- a social and humanitarian component;
- a basic specialization component;
- a secondary specialization component;
- and a component of orientation to another field of formation, or Master's Studies.

Using Information and Communication Technology the curriculum involves the development of digital competences for future teachers of mathematics and Informatics through a number of

courses: Educational software and educational platforms, Informational and educational technologies in education, Programming language Java etc.

The program is a full time education that takes 4 years with 60 credits each leading to a total of 240 ECTS credits.

Experts' Evaluation

The Balti State University provides a complete English version of descriptions of the study program (Module Handbook). The Table of Contents is missing in the module handbook as well as page numbers. Both are important using the handbook for students, instructors and teachers as well as for review. The Table of Contents is important to find information about the details of the curriculum more detailed and in shorter time.

Students are only supported in the most cases by course program plans and oral introductions by each lecturer at the beginning of the semester. In some cases a module description supported by in the eLearning Platform Moodle is available. Therefore a description for each module of the study program must be provided to the students. This should be the description handed in for the accreditation procedure (English), but due to the need of the students a version in Romanian would be recommendable. The idea of such a handbook is to support your students with information of the study program. It should be secured that the learning outcomes are carefully formulated. The English version has some mistakes in a few module descriptions. An example is the description of *Fundamentals of Programming* which seems it is the same as *Applications of Multimedia Technologies*. In the documentation a course overlap is given.

The description of the learning outcomes is incomplete for the curriculum. It is just given for each course. The documentation must clearly describe which skills can be reached till the end of the course program and how each module of the program is related to these overall goals. The informatics learning outcomes must be clearly described in the context to educate teachers as well as IT experts. It must be clear that the focus of the program is the education of teachers. However, the skills needed are not clearly described in the program description. The program structure is given by a didactic plan of the department. This plan was not provided during the visit. It is necessary to describe the fundamental idea of the course program and to rewrite the documentation carefully. The module handbook must be completed and descriptions the overall goal of the study program as well as every single course/module must be written in a competence oriented manner. The overlapping of courses must be reduced. **(Finding 1)**

Even when the program „Licenciate in Mathematics and Informatics" at Alecu Russo Balti State University has some well defined features, some suggestions arise when looking closer to the various content aspects of the curriculum. The expert group already found some engagement of the staff of the university in permanently redefining the curriculum, so that the following suggestions and recommendations can go together with own results and conclusions of the university. The following directions for change could be identified **(Finding 2)**

(1) The students ask for more specialized courses in Mathematics and Informatics as well, however emphatically in mathematics. They seem to be eager and ready to have more and deeper lectures in the subject. They wish for their lectures to gain more insight into research in all fields, the subjects Mathematics & Informatics and the respective didactics.

(2) In the field of mathematics education an interesting development can be observed. The module on active-participative methods in teaching mathematics, combined with modern educational technologies indicates a change from only subject oriented thinking towards the learning issues. This road should be taken further. Taking active approaches to learning serious, however, reacts to the university courses themselves. More independent learning, more group learning, more pro-

ject work, should be considered and planned. We recommend going this road as quickly as possible, and reporting about the first steps soon.

(4) The expert group notes with appreciation on the one hand that some general courses in the humanities are incorporated in the curriculum. However, as it turns out from the descriptions of the teaching staff, and as it was confirmed by the student responses, these general courses are not tied as much to the subjects Mathematics & Informatics as it seems desirable and necessary. As a recommendation, the Alecu Russo Balti State University should work on that issue and present a plan how to combine the general course with these two subjects.

There is an official agreement between the university and the School Board in Balti that allows students to perform the internship (pedagogical field experience) in good schools. There are four periods of internship, one in pedagogy, one in psychology, one in informatics and one in mathematics. After completing the internship, each student has to fill a report containing all its activities. The internship is finished with an exam. Students finish the internship by acquiring good abilities for teaching. It would be desirable for students to be in contact with the internship program at same earlier stage to decide for themselves if they really want to become teachers.

Informatics

Balti State University's approach to informatics is application oriented. The program starts with a course on standard software applications and goes then more to details and teaches the programming skills later in the program. Therefore a few courses deal more with the application level (e.g. *Educational Software and Learning Platforms* as well as *Applications of Multimedia Technologies).* This concept has to be clearly worked out in the general program outcomes to give future students a clear idea of the IT program of Balti State University. A disadvantage of this clear application oriented approach is a connection missing between mathematics, mathematics education and informatics. A course introducing standard mathematic applications (numerical and analytical software is missing). Computers are at first calculators and could be used in this way very powerful. However, if it is a strategic decision to have a focus on learning platforms and only to support didactics by computers this must be clearly described in the learning outcomes of the course program. **(Finding 2)**

The university describes that teaching programming languages as *Java* and giving a course in *Web Programming* shall enable students to work later as IT specialists. However, to support these outcomes a sufficient education in programming is missing. This means a course in software engineering and project management does not exist. A software engineering course will help also to teach project oriented problem solving in a team. In such a course students should design and develop a larger project in informatics defined by the teachers in a team of 3-5 students. The experts recommend offering such a project in two semesters **(Finding 2)**. With a supporting lecture in software engineering students will learn more extensive programming as well as project skills within one course. A second missing point is a tight link between mathematics and computer science. It is very important to integrate modern mathematical tools as computer algebra systems (CAS) and commercial numerical solvers in the study courses as well. It is necessary to document in module descriptions how software applications will be used in a course and in the program as a whole. **(Finding 2)** Balti State University has such a program on master level. The faculty has to revise carefully how computers can be used as mathematical tools at bachelor level. In the course *Computer Architecture* hardware skills are taught by using simulation programs. This is an interesting approach. However, the experts recommend an assembler programming course on cheap embedded platforms as RasberryPi for example. The advantage is to teach a second technical platform complement to the existing PC platform. The university should have in mind that software is also a resource as well as hardware. The documentation must clearly describe which software applications are available at Balti State University.

The program reflects the European standards for mobility, as module descriptions with learning outcomes as well as ECTS credit points. Learning agreements should be provided. However, due to historical facts it is hard for students to move to Western Europe. To start an exchange program Moldavia has to improve the education in English language as a key to participate in globalization. However, it seems important to support cultural diversity and the roots of Moldavia by preserve the Russian language skills as well. This requirement was also made by students of Balti State University. The students would like to learn more English or other foreign languages compared to what is now offered by the program. They asked for courses that are offered continuously in the program. The experts recommend to give up the one(or two)-hour-a-week approach and to create alternative ways to immerse in the foreign language. **(Finding 3)**

The workload of students is not monitored at Balti University. Yet, it is not transparent how workload is determined. Therefore a process to evaluate credit points (ECTS) must be established and documented. It should be documented how the evaluation of lectures takes place and it should be clearly described how students are included in the process of quality improvement of courses. **(Finding 4)**

4. Student Support

Since the program combines the studies in two specialties it also requires effort from students, and a higher number of hours of direct contact than of independent work is foreseen. The curriculum for the study program "141.01 Mathematics and 141.02 Informatics" specifies the number of hours of direct didactic activities, the amount of hours needed for independent preparations and the number of credits for each course unit. Initially, the curriculum starting in 2005 provided 3,942 hours of direct contact and 3,258 hours of independent study. Subsequently, in 2012 the plan was modified, and according to the new plan, the total number of direct contact of hours of is 3,825, and the total of hours of independent study constitutes 3,375. The total workload of students remained at 7,200 hours

Each professor decides the forms of assessment used within the recommended current regulations depending on the specifics of the course unit. The current assessments are commonly written tests, but some course units, such as pedagogy, psychology, didactics of Mathematics, Informatics didactics etc. use also other forms of assessment, such as portfolios and projects. Teachers plan in advance both the number and the forms of current assessment, and the time when the assessment will be performed. An examination schedule is established by the Dean's Office, which states the time and location of the assessments. An important evaluation form is the public defense of a course paper. It is presented in front of a committee consisting of three professors of the department.

The graduation examination is available to students who have fulfilled the provisions of the curriculum and have accumulated 226 credits of study and have passed the preventative presentation of the graduation paper in front of the Department Staff. The graduation examination includes a written test - test of knowledge of basic mathematical disciplines; an oral test - test of knowledge of the basic disciplines of mathematics and Didactics of Mathematics; another oral test - an examination of knowledge of secondary specialty subjects - Didactics of Informatics and Informatics; and a public presentation of a course paper.

Responsible for consulting services during the academic year is the Head of Department, who approves the schedule of the consultations and aims the realization of the consulting hours. For counseling concerning exams the responsibility lies with the vice-dean of the faculty. During the

first two years of study, the academic groups have tutors, with whom the students discuss various aspects of the educational process. If necessary, the tutor may ask the holder of the course to provide, at the request of students, additional consultations.

Experts' Evaluation

The assessment regulations are clearly defined in advance of every semester. The assessment is divided in tests and homework during the semester and 4-7 exams at the end of the semester. In the discussions with students they stated that the time to prepare for exams is sufficient. The relation between ECTS and workload is problematic for some classes. These deviations happen in both directions, but should be targeted by the faculty in the future. Based on the discussions with students, the workload within the semester is manageable. If the workload is excessively high, students can discuss this in an open atmosphere with the professor. Students confirmed that this process is efficient and the total workload does not reach unfeasible levels. Despite this informal way to measure the workload there should be a concrete evaluation in how far the real workload of the students is in balance with the credits students can earn in a module. The quality management system of Alecu Russo Balti State University seems to be able to such an evaluation. **(see Finding 4)**

The design of the exams seems sufficient to measure the achievement of the intended learning outcomes. The experts read a couple of first year mathematics exams of the program and the exams demonstrate an understanding of the basics of mathematics tough at universities. Failure rates in exams are low in the first semester and zero afterwards. The professors stated that beginners fail at the beginning of the studies, so only the better students stay and they manage to succeed in the exams. If students fail, additional tutorials are offered to them to prepare them for additional attempts. Two further attempts are possible. The third attempt is evaluated by a board of professors to ensure fairness. If students fail all three exams, they have to repeat the class. The mixture of oral and written exams seems strongly biased towards written exams. The students of USB are not opposed to this unbalance, but the experts think that more oral exams might help to better assess the learning outcomes of the program. In addition the number of project/practical based learning units as well as corresponding examinations such as presentations currently is quite low. The experts see room for improvement in this field, too. **(Finding 5)** The students in the discussion shared these opinions. The students did not complain about any unfair grading or extensive time periods until they receive feedback on their exams.

The department responsible for the study program provides the counseling activity for students. The information provided to students at the beginning of the program is sufficient. A mentor is assigned to each semester and provides the students with rules of the university, the curriculum and other administrative information. This also includes information about possibilities to study abroad. Teachers introduce the course at beginning of a semester. In addition to information about the study program, students can get information about career possibilities, side jobs as well as scholarships. The discussions with the students showed that there is no shortage of information and university staff as well as professors are available for questions at all times. This is also the case for questions regarding details of single courses, including comprehension questions. Students have online access to information (Moodle platform) but not to all documents are available. The module handbook is not available as a whole. There is not an official tutoring program offered to the students.

In contrast to many positive aspects at the Balti State University, other aspects leave room for improvement. While information on semesters abroad is given and a clear positive trend is visible, the number of outgoing students is still very low. This is partially based on limited language skills in English. The experts see progress in this field in the last years, but further effort is essential to send more students abroad. **(Finding 6)**

Another aspect recognized by the experts is a national issue and not specific for this University or study program: The module 'Physical Education' is a required course for all students and no ECTS points are awarded for this effort.

The expert group appreciates establishing preparatory courses for the pupils coming from school to the University. This is one of the elements of the support system Alecu Russo Balti State University provides to the students. A second element is that the university has a mentoring system from the beginning of studying. It could maybe supplemented by a system of tutoring the younger students by elder students.

5. Career orientation

Based on the information provided by the university graduating students of the program are demanded in their field of training, and the employment rate of graduates is 100%. At the end of the study program all graduates are employed as teachers of mathematics and Informatics.

The program offers to the graduates the employment possibility as a teacher of mathematics and Informatics at the gymnasium level, in education centers, in vocational schools; but also to work as a programmer in public organizations, NGOs or information centers.

When setting up the program it was taken into account that future teachers also need a psycho-pedagogical training. These course units (Psychology and Pedagogy) make up a quarter of the expected credit of the program (60 ECTS credits).

Beyond this graduates have access to master's programs in education science, in didactics of mathematics and informational and communicational technology, and in educational management. Likewise, in order to give graduates the opportunities to do a master program in another field, included in the study program are orientation course units from the area, of Exact Sciences 443 Mathematics or 444 Informatics.

Experts' Evaluation

Taking into account the primary profile of the Programme – preparing mathematics and informatics teachers – full information on the requirements and availability of employment in teaching positions is collected, analysed and duly disseminated on a formal basis.

We have found strong evidence of strong involvement of the direction of the University / Programme with the Ministry of Education, local authorities and alumni in order to:

- identify and influence the national frame curriculum, that sets the guidelines and limits of the programme's objectives
- identify trends and alternatives in employability of graduates; in such respect, we have found evidence that graduates were supported to find a complementary employment as primary school teacher and to access state incentives for relocation in the countryside;
- provide internship / practice opportunities.

Students in the teacher's education program pointed out that practical studies in schools should start earlier in the course of the curriculum.

The students find after finishing their study at Alecu Russo Balti State University nearly all good jobs. Not only teachers leave the university, but a broad spectrum of different professions was shown in the discussion with students and alumni. They all stated that Alecu Russo Balti State University gave good preparation and tries to keep in contact with the alumni.

The experts found clear evidence of involvement with private sector employers in order to identify alternative employments for graduates in the IT sector, as well in aligning informatics topics with the requirements of the labour market. Still, taking into account the marked decline in enrolments in the past years, correlated with a significant stock of unoccupied teaching positions, a more structured approach to communicating alternative employment opportunities towards students and potential candidates might increase attractiveness of the programme for candidates, students and graduates.

Also, the programme and the university as a whole could benefit from a formal structure to the interaction with the representatives of the labour market, such as “curriculum workshops”, official partnerships, joint scholarships, periodic meetings / feedback. **(Finding 7)** Such benefits can come in terms of increasing the attractiveness of the programme to potential graduates, increased employability for graduates, joint projects with companies that can improve infrastructure, and research opportunities.

The Diploma Supplement handed to the student at the completion of the programme follows a national template, that in its turn mirrors the Outline Structure for the Diploma Supplement, developed by the European Commission, Council of Europe and UNESCO/CEPES, as identified in the official document http://ec.europa.eu/education/policy/higher-education/doc/ds_en.pdf: 1 Information identifying the holder of the qualification, 2 Information identifying the qualification, 3 Information on the level of the qualification, 4 Information on the contents and results gained, 5 Information on the function of the qualification, 6 Additional information, 7 Certification of the supplement, 8 Information on the national higher education system.

6. Resources

The chair of mathematics and informatics has 40 employees. The chair is filled with a full professor holding a PhD. Included are seven doctors as lecturers, six doctors as senior lecturers, six senior lecturers, thirteen lecturers, an engineer as programming coordinator, a head of laboratory, and additional support staff. The share of teaching staff with scientific degrees and didactic titles within the chair is 42.4 %. In the study program no lecturers on a short-term contract basis are involved, as all positions are filled with regular tenured positions. A full list of teaching staff including their short academic CVs and qualifications is part of the application for accreditation.

All courses offered in the program are taught exclusively for the program „Mathematics and Informatics“ and are not used for other subjects. However, the staff involved in the program also teaches in other specialties as the chair covers all mathematic courses that are taught at the university.

The scientific symposium „Tradition and innovation in scientific research“, that is also open to students, is an example for the link between teaching and learning beyond the research of the staff that feeds directly into the lectures and courses.

In 17 different computer rooms the chair offers more than 250 computer workstations for teaching and learning. The encyclopedic collection of the Library offers approx. 290,000 titles in 57 languages. 25% of these titles are in Romanian language, 63% in Russian language and 12% in other foreign languages as English, French and German.

Experts’ Evaluation

The academic staff involved in the study program consists of 32 lecturers, 14 of whom have a Ph.D. degree. There are no part-time teachers; the full-time academic staff covers all teaching activities. The program can be covered by the actual personal. Most of the academic staff is bilingual (speaking Romanian and Russian) and this is very helpful for students not very proficient in

one of the two languages. A not so well acceptable aspect is related to the teaching load for the academic staff, which is very high (at least 16 hours/week), and does not leave too much room for research activity. The level of the research activity is low; only one professor has papers published in journals of good impact factor. However, reducing the teachers workload and to increase the number of teachers could improve the quality of education because the education of teachers is nearer on actual research results.

The information on lecturers provided by Balti State University in the SER is incomplete in a way that only the number of publications is provided to present the teaching profile. To review how teaching in the course program is supported by research the documentation of each lecturer should include a list of the most 5 significant papers, including authors, title and kind of publication. It's also unclear if appropriate didactical qualification is secured. The university should update and rewrite the documentation considering this aspect. **(Finding 8)**

Professors from the Department of Pedagogy cover the general courses on pedagogy/didactics. The specific of the disciplines within the study program are covered only at the seminar levels, which might be acceptable at some low level.

In Republic of Moldova, all academic positions have to be reconfirmed every five years. There are two sides regarding this. The positive aspect refers to the permanent care of the academic staff to improve their teaching and scientific activity. The negative aspect refers to the lack of security for having a permanent position. After every five years each, each academic staff has to report on its didactic and research activity to be reconfirmed or be promoted for a higher position. It is very good that for renewing the contract, there is a very detailed list of indicators at the university level, which includes about 400 items regarding didactic activities, research, teaching quality and extracurricular activities. A positive and motivating aspect is that these indicators are used also to provide differentiate salaries within the academic staff. After each course, students give feedback about teaching by filling in questionnaires. The results are drawn into attention when contract has to be renewed as well as for the differentiate salaries.

The faculty does not have a separate budget. At the university level, 20% of the research budget goes for co-financing the research projects. It is good that at the university level, there are internal competitions for research projects and a special one for young researchers.

At the department level there is a timetable informing the students about the office hours for each professor. A positive aspect for encouraging the individual study of the students is represented by the two reading rooms ("Cabinet methodological"), which are equipped with mathematical textbooks that are available to students.

Balti is the only university in Moldova that is a campus university. There is a good IT infrastructure: modern PCs are supported to the students at Balti State University and a refresh program is also given. During the evaluation of the program it was shown that modern mathematical software applications are used. However, the documentation of resources only reflects the hardware part. It is not transparent which software applications are available, how many licenses are given and how they paid. It is recommended to document clearly software needs as well as hardware needs and to allocate a budget for software. **(Finding 9)**

A hardware computer laboratory is missing. Technical computer skills are one corner stone of modern teaching informatics. During the future development of the program Balti State University may develop a plan setup a small hardware lab using cheap embedded platforms.

The library has more than 1,000,000 copies and provides 800 workplaces. Class rooms are available for the number of students. Access to the internet is given. Student should have access to internet based journals as well as standard literature in a state of the art library.

70% of the students, whose studies are financed from the budget, receive also various types of scholarships (for good school performance but also to assist students with very low family income).

7. Quality Assurance

In November 2008 the university started activities to implement a university wide quality management system that is also applied for the study program under review. Quality assurance procedures regarding the curriculum are discussed during chair sessions at least two times during a year of study. All the professors of the chair participate at the session.

The teaching activities within the program is managed and coordinated by the head of the chair. Each professor and lecturer is obliged to develop the curriculum of the discipline in accordance with the "Curriculum Framework-Structure" approved by the Senate the university. The description of the curriculum must contain at least the following components: course identifying information (discipline), integration of the course in the study program, prior skills, competencies and skills developed within the course, aims of the course, contents, individual work activities, evaluation, and informational resources. Each curricular element is discussed and proposed for approval at the meeting of the chair, where it is reviewed by the faculty Methodical Commission and approved by the Faculty Scientific Council.

A first graduate survey is offered directly after graduation while graduates are still on campus using an electronic and anonymous survey in the computer room of the university. Additional graduate surveys are done electronically using emails. The survey covers questions concerning the graduates job profile and competencies required for the positions. The results of these surveys are discussed in the first meeting of the Senate, where the vice-rector for part-time education and continuous training presents a comprehensive survey of all graduates of the university.

Experts' Evaluation

The quality assurance system seems to be quite well developed. The Alecu Russo Balti State University has established a Quality Management System on an institutional level. The quality management system, implemented and certified against the ISO 9001 standard, defines rules and mechanisms to collect detailed information related to student progression and success rates, students' satisfaction with their programmes, employability of graduates and evaluation of the programme by graduates, the institution's own key performance indicators, results of teaching-staff and course evaluation and de facto student workload. The mechanisms (questionnaires) are clearly effective and provide for data objectivity and accuracy, and the data collected is analysed yearly in the framework of the quality management system.

Although there is extensive data collection, there are still unused opportunities of data analysis as a trigger for improvement. For instance, data collected from graduates with regard to actual workload can be used to refine correlation between workload and credits, and also to accurately evaluate and report teaching load.

Relevant information is collected on an informal basis by teaching and management staff with regards to student profile and employability of graduates in alternative fields (other than teaching).

Still, the programme and the university as a whole could benefit further from implementing a formal approach to collection, analysis, dissemination and using such information to stem improvement initiatives. **(Finding 10)**

8. Recommendations of the panel of experts

The panel of experts recommends to accredit with conditions the Licenciate in Education Science "**Mathematics and Informatics**" program (Bachelor Level) offered by **the Balti State University in Balti, Republic of Moldova.**

Findings:

1. It is necessary to describe the fundamental idea of the course program and to rewrite the documentation carefully. The module handbook must be completed and descriptions the overall goal of the study program as well as every single course/module must be written in a competence oriented manner. In the documentation of the program the overlapping of courses must be reduced.
2. Concerning curriculum:
    a. Lectures in Mathematics & Informatics and the respective didactics in the subject should give more insight into research.
    b. Active-participative methods in teaching mathematics should be strengthened. More independent learning, more group learning, and more project work should be offered.
    c. The university should present a plan how to combine the general course with the two subjects.
    d. The concept of Informatics has to be clearly worked out in the general program outcomes to give future students a clear idea of the IT program of Balti State University.
    e. A course in software engineering and project management should be included in the curriculum.
    f. It is necessary to document in module descriptions how software applications will be used in a course and in the program as a whole.
3. Foreign language courses should be offered in a way that students can improve their language abilities more intense.
4. It should be documented how the evaluation of lectures takes place and how students are included in the process or quality improvement of courses. The evaluation should also include the aspect if the real workload of the students is in balance with the credits students can earn in a module.
5. The range of competence based exams should be broadened (oral, project/practical based, presentations).
6. There should be continuously strong efforts to increase the international mobility.
7. There has to be a clearly defined process how the update of the curriculum is organized involving the stakeholders.
8. The documentation of staff resources should be updated.
9. It is recommended to document clearly software needs as well as hardware needs and to allocate a budget for software.
10. The university should focus the QM-system on the outcomes that are needed and how improvement measures can be reached. Based on the target a formal approach to collect and analyse the data provided by the QM-system could be implemented.