

KAZAKHSTAN NATIONAL TECHNICAL UNIVERSITY AFTER K.I. SATPAEV

EVALUATION REPORT

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1. Introduction

This report is the result of the evaluation of Kazakhstan National Technical University after K.I Satpaev. The evaluation took place in spring 2011 in Almaty, Kazakhstan. In this report, the Evaluation Team offers its observations and recommendations regarding the Kazakhstan National Technical University after K.I Satpaev. The Team is sensitive to the constraints the University faces; nevertheless it believes that the following recommendations will assist the University in pursuing changes that will allow it to continue to advance towards its goals and ambitions.

1.1. Institutional Evaluation Programme

The Institutional Evaluation Programme (IEP) is an independent membership service of the European University Association (EUA) that offers evaluations to support the participating institutions in the continuing development of their strategic management and internal quality culture.

The distinctive features of the Institutional Evaluation Programme are:

- A strong emphasis on the self-evaluation phase
- A European and international perspective
- A peer-review approach
- A support to improvement

The focus of the IEP is the institution as a whole and not the individual study programmes or units. It focuses upon:

- Decision-making processes and institutional structures and effectiveness of strategic management
- Relevance of internal quality processes and the degree to which their outcomes are used in decision making and strategic management as well as perceived gaps in these internal mechanisms.

The evaluation is guided by four key questions, which are based on a 'fitness for (and of) purpose' approach:

- What is the institution trying to do?
- How is the institution trying to do it?
- How does it know it works?
- How does the institution change in order to improve?

1.2. Kazakhstan National Technical University and the national context

The Kazakhstan National Technical University after K.I Satpaev (hereafter: KazNTU/the University) is the first university in Kazakhstan to participate in the Institutional Evaluation Programme. The University has its origins in the establishment in 1933 of the Kazakh Mining and Metallurgical Institute based in Semipalatinsk. The University was granted the status of a national university in 2003. As one of the nine national universities in Kazakhstan, it holds a prestigious position amongst the Kazakh higher education institutions, including national

education and research functions. Today, the University hosts 13 000 students and 3000 staff, of which 1288 are academic staff. The University has 11 scientific institutes, six research centres and over 200 laboratories. The University currently trains engineers in 46 licensed Bachelor's, 40 Master's and 20 PhD programmes, and is ranked in the first place in engineering education in Kazakhstan.

Higher education in Kazakhstan is in a state of change, the country having recently signed the Bologna Declaration. These changes are likely to be doubly challenging for Kazakhstan, which has not previously followed a western tradition of higher education. However, the country's economic growth presents the government with an opportunity to increase investment in higher education. The government has shown some willingness to move towards international best practice in teaching, research and quality assurance; there is potential for it to continue to do so. The government has, for example, seen the need to strengthen the research status of designated universities. It is faced with many challenges, such as low investment in higher education and research, the traditionally centralised steering of higher education with little flexibility, and an aging academic staff.

In this context, KazNTU has decided that it wishes to become a designated research university. As the leading engineering university in the country, KazNTU seeks to become an international research university and to educate the new generation of professionals with competitive engineering education for the needs of the national labour market. In research, the priority areas of KazNTU include the new technologies in hydrocarbon complexes and petrochemistry; the development of mining, geology and metallurgy; the construction industry, housing and communal services; innovative technologies in energy, machinery and sustainable development; and information, communication and space technologies. In looking to the future, the University has prepared a development strategy comprising a set of aims, objectives and indicators. The University has adopted some of the Bologna Process objectives such as the three-tier degree structure, and has begun modernizing its curriculum. It has aimed to increase the scope and quality of its research, to expand the number of its MSc and PhD programmes, and to increase collaboration with industry and internationalisation, including internationally accredited degree programmes. It has set up central services for quality assurance, international cooperation, information management, human resources development and facilitating commercialisation of innovation. In order to follow the progress of its development strategy, the University is measuring a set of predefined indicators, collecting student feedback, and consulting stakeholders and employers.

Professor Zheksenbek Adylov was appointed rector of the KazNTU by the President of the Republic in 2008. The senior management Team of the University comprises the Rector, and six Vice-Rectors nominated by the rector: Vice-Rector for Academic and Methodological Affairs, Vice-Rector for Research and International Relations, Vice-Rector for Academic Affairs, Vice-Rector for Social Affairs, Vice-Rector for Students' Affairs and Vice-Rector for the Development of Infrastructure. Additionally, the Rector's board responsible for the operational management of the University comprises the deans and the directors of central departments. The supreme decision making body is the Academic Board, which consists of 51

members, including the Rector, all the Vice-Rectors, the deans, heads of central departments, representatives of the institutes and a student member.

1.3. The Self-Evaluation Process

The self-evaluation process was undertaken by a self-evaluation team which was established by Rector Professor Zheksenbek Adylov in 2010. The team consisted of the Vice-Rectors, as well as the Director of the Department for Strategic Planning and Development, Dr. Gulnara Sarsenbayeva, who also acted as the liaison person between the University and the IEP Team. The institutes and the chairs were also consulted in the self-evaluation process, and the self-evaluation report (hereafter: SER) was introduced at the meeting of the Rector's board. However, knowledge about the SER varied greatly amongst the staff members and students met by the IEP Team.

The SER provided the basic information on the structures and operations of the University, as well as the national legislative and operational context of the University. It pointed up some of the immediate issues for further inspection and discussion, and included an analysis of the strengths, weaknesses, threats and opportunities of the University. In addition to the SER, the IEP Team had at their disposal additional material provided by the University regarding the internal strategies, the curriculum and the longitudinal development of the input and output figures of the University and its various operations.

1.4. The Evaluation Team (later Team)

The SER along with the appendices was sent to the evaluation Team in November 2010. The first visit of the evaluation Team was originally scheduled for December 2010, but due to severe weather conditions, travel turned out to be impossible, and the visit was rescheduled. The visits of the evaluation Team to the KazNTU took place on 16-17 March 2011 and 6-8 April 2011, respectively. In between the visits the University provided the evaluation Team with some additional documentation.

At various meetings the Team spoke with the Rector and Vice-Rectors, the Self-Evaluation Team, the Scientific Research Council, the Academic and Methodological Council, senior administrative staff, the deans of some of the institutes and heads of chairs and research centres. The Team visited some research centres and several institutes, and met with a number of staff and students. Moreover, the Team had occasion to meet with some of the University's external partners. The discussions were always open and candid. The Team was also able to visit other university facilities such as laboratories and dormitories. The University provided the Team with external interpreters, who translated the discussions between the Team and the members of the University community, as this was necessitated by the generally low level of English proficiency.

The Evaluation Team consisted of:

- Professor Maria Helena Nazaré, former Rector of the University of Aveiro, Portugal, Chair of the Evaluation Team
- Professor Maxwell Irvine, former Vice-Chancellor of the University of Aberdeen and the University of Birmingham, United Kingdom
- Professor Karol Wysokiński, former Vice-Rector of the M. Curie-Skłodowska University in Lublin, Poland
- Mr Fernando Miguel Galán Palomares, student at the University of Cantabria, Spain, and,
- Dr Terhi Nokkala, University of Jyväskylä, Finland, the Team coordinator.

The Team would like to thank the KazNTU, and especially its Rector, Professor Zheksenbek Adylov and his colleagues, for the open atmosphere in which all meetings and interviews took place, as well as for the detailed arrangements of the visits. The Team appreciated that every effort to accommodate their wishes was made, and greatly enjoyed the cordial hospitality of the visits. Special thanks are due to the many interlocutors met during the visits, and the invaluable work of the Dr Gulnara Sarsenbayeva and her Team, who were very helpful in organising the two visits and in making available all the information asked for by the Team.

2. Constraints and institutional norms

2.1. Governance and management

The Team notes that the KazNTU, being one of the nine national universities in Kazakhstan, with 21 internationally accredited degree programmes and ranked first in engineering education in the country, enjoys considerable prestige at the national level, which it can use to drive its future development. Establishing the strategic development programme with aims, objectives and indicators is commendable, although it seems to the Team that the implementation of the programme has not yet taken full shape, and that while indicators have been established, there does not seem to be a clear action plan for the university act upon the results of those indicators.

The University has an active and motivated rector and benefits from the support and cooperation of its stakeholders. Internal sharing of the infrastructures and facilities enables the University to use its scarce resources efficiently.

However, the University seems to be facing a situation of limited autonomy at all levels. First, the Kazakhstan higher education system appears to be highly centralised, with the Ministry of Education and Science holding considerable control over the operational context of higher education institutions. The state budget funding for higher education institutions is allocated as a line-item budget, over which institutions themselves have little control. The curriculum is also state-controlled to a large extent, with the state standards considerably constraining the ability of universities themselves to design – or modernise – their own curriculum. National legislation also seems to partially mandate heavy teaching loads for staff, which constrains both the university's capacity in task assignment, and the capacity of the staff to do research; this makes it harder for the University to move to a more research-intensive position. Inflexible and over-centralised management of financial resources at the University level also hinders its innovative capacity.

Due to the historical background of a highly-centralised decision-making process, the University seems to have top-heavy decision making structures. The competencies of the different governing bodies and central administration units are unclear and overlap. For the efficient management of any large organization, it is important for the whole community to have a feeling of ownership over process. This is best done in by spreading the base of the governing bodies so that the entire community moves towards a shared goal. However, the Team notes that in KazNTU the representation of different groups of the University community (especially students) is limited. These constraints make the university's governance slow-moving and unwieldy, and burdens the strategic leadership of the institution with many operational issues, which could be more efficiently dealt with at lower institutional levels. At the same time the organisation seems to be lacking a wide-reaching quality culture.

2.2. Teaching and learning

The KazNTU has a strong national reputation in education in its subject fields in engineering. It enjoys a good reputation amongst prospective students and employers, and is a popular place to study. The students of KazNTU are in general satisfied with the teaching of the University, as well as the accessibility of the academic staff.

The KazNTU grants three higher education degrees: bachelor, master and PhD. The curriculum is largely determined by the state, which leaves little space for curriculum innovation. It comprises three categories of disciplines: general disciplines (including humanities and social sciences, physical education and history of Kazakhstan); basic disciplines such as mathematics, physics and chemistry; and professional disciplines. The studies consist of large numbers of contact hours in classrooms, and several subject studies per semester. This means that students have little time to reflect upon what they have learned, and thus may not develop adequate problem-solving skills. Laboratory access is also limited.

The University has taken some steps to modernise its curriculum to meet the changing demands of contemporary working life; for example the number of teaching hours in professional disciplines has been increased, and the representatives of industrial employers have been involved in curriculum design through industrial advisory bodies. Pedagogical training for staff is available, and has to some extent been incentivised. The students the Team spoke with felt in general that it was easy for them to raise any issues they might have over curriculum or quality of teaching. They were well-informed about study-related matters such as timetables, course contents and methods of assessment. Taking into account the severe financial constraints of the institution, the undergraduate teaching facilities are at a reasonable level.

The University has implemented an online student quality questionnaire, which all students must answer before being able to access their exam results. The questionnaire includes questions about quality of teaching, facilities, and social life. The feedback from questionnaires is analysed, and taken into account when deciding about renewing staff contracts or promotions.

The core of any university is that education is research-based, and that research results continuously feed the latest knowledge back to education. The Team noted, however, that despite KazNTU's aim to become a research university, the understanding of this integral connection between education and research seems to be limited amongst the different university communities, and that these two are treated as separate activities rather than as two sides of the same coin. The University is also hampered by the centrally constrained curriculum which is not always appropriate to the needs of 21st Century labour markets, which are dependent on the independent problem-solving skills of graduates. Some of the practical skills required of an engineer also remain to be learned after graduation in employment; Interdisciplinarity of the programmes is limited.

2.3. Research

The KazNTU seeks to become a research-intensive university, recognised not only in Kazakhstan but also internationally. To this effect, the University has applied for the status of a research university granted by the Ministry of Education and Science in Kazakhstan. The University has taken the first steps in this direction by determining a limited number of research priority areas, which are closely related to its expertise and to the opportunities in its operational context. It is commendable that the University has also put in place a policy of rewarding highly productive staff for their research performance.

The University has some active and experienced researchers, who are able to attract research grants and publish in internationally recognised journals. The University cooperates actively with national research institutes and multinational companies located in Kazakhstan. Its research budget for the year 2010 was approximately 3,1 million Euros. In 2008-2010, the University staff produced 30 international publications in highly cited international journals, 57 manuals and 3000 articles published in Kazakhstan and the countries of the Commonwealth of Independent States. The University also holds a fair number of patents, 120 in total.

The representatives of the University's stakeholders interviewed by the Team noted that they support University's attempt to gain the research university status, and open research contracts for tender. The University benefits from having one of the only two supercomputers in Kazakhstan, to which the staff has free access. This is a true asset to the University's research ambitions. Also the concept and facilities of the TechnoPark benefit the University, as they enable researchers to develop and commercialise their inventions in collaboration with companies.

The University seems, however, to lack an explicit operational policy on how to go forward with its research priorities, as well as clearly set targets for individual and institutional research production. The University does not have a clearly defined IPR policy, and there may be occasions where the University will draw no benefit from commercialised innovations made using the University resources.

The KazNTU research activities are, in general, somewhat modest. Only half of the University's academic staff is engaged in research; the range of funding sources for research is limited, and research does not seem sufficiently to enlighten the teaching activities. The majority of the research output consists of publications in national journals, journals published in other CIS countries, as well as series of manuals and theses with limited audience. The extent of publications in international high impact journals is limited. The research capacity of the University seems to suffer from the lack of funding available especially for curiosity-driven research. However, the greatest hindrance lies in the heavy teaching loads of academic staff, which hamper their ability to concentrate on research. The staff total workload is 1500 hours/year, of which teaching may be 600-800 hours. Additionally, academic staff is involved in extra-curricular activities such as student counselling or clerical work, which also reduce the time available for research. Students are involved in some research projects from Bachelor level onwards.

The Republic of Kazakhstan has recently discontinued the old research degree system comprising Candidate of Science and Doctor of Science degrees, and introduced PhDs as the new level of research degrees. This shift seems to have caused some confusion and discontent in the University, especially regarding the relation of the new PhD degree to the old Candidate and Doctor of Science degrees, and its potential relation to the qualifications required of a professor. It should be noted however, that in most countries in Europe, although holding a PhD is the first prerequisite of a professorial appointment, an extensive research record and experience is also always required.

The University currently has a limited number of licensed PhD programmes, and the procedures for managing the programmes and ensuring their quality seem to be largely missing. The low numbers of MSc and PhD students mean that the ability of the University to regenerate its academic staff is limited.

2.4. Resources

As a national university, KazNTU receives a higher per capita income from the state than other public universities. It receives approximately three quarters of its income as a line-item budget from the Ministry of Education and Science. The bulk of this is received in the form of state-grant received by the well-performing students, and paid by the government to the institution the student chooses to study in. The state grant is based on the fixed costs, and is set at 2930 Euros per year. The University also receives extra-budget income from fee-paying students and research contracts with different ministries and companies. The tuition-fees for fee-paying students are currently set by the University at 2546 Euros per year. Although the fees do not cover the actual costs per student, the University faces stiff competition for students and it is therefore hard to raise the fees. Approximately 70% of students receive state grants, 20% pay fees and 10% receive commercial sponsorship.

The University also has the capacity to generate additional funding streams through appropriate management of the advanced research facilities such as the supercomputer and the TechnoPark. Due to its higher state grant, and self-generated funding, the University is able to pay its staff higher salaries than other public universities, thus making it an attractive place to work, and compensating for the higher living cost in Almaty.

However, the Team noted that University seems to lack a clearly defined set of procedures for negotiating and costing research contracts with external research funders, such as companies. Although contract research is valuable in enabling the University to expand its research infrastructure, it may ultimately cost the University more than it brings unless the University prepares a realistic costing system for research projects, including overheads to cover indirect running costs. There is little or no money available for curiosity-driven research, and despite fairly well-developed research infrastructures in some of the University's research fields, most fields are hampered by the lack of adequate research equipment. Also some of the other facilities, such as dormitories, sports facilities and wireless internet infrastructure are in dire need of redevelopment. The line-item budgeting of the public

funding means that the University has little possibilities to direct its own activities and develop its strategic capacity.

2.5. Internationalisation

The University has taken some steps to make its activities more international and to integrate to the world educational and research sphere. The University is ranked in the 601+ category in the Quacquarelli Symonds World University Ranking, and has 21 programmes accredited internationally by organisations such as ASIIN, ABET and the Russian Accreditation Centre. To improve its education offer, the University is developing dual diploma programmes with partners in Russia and Europe. It has education and research collaboration with universities in, for example, the United States, China and some countries in Europe and South-East Asia. Recently the University has established a policy of international co-supervision for PhD theses. The University has some 300 international students, many of Kazakh origin but with citizenship of some of the neighbouring countries.

However, despite these steps, the University starts its quest to become internationally recognised from a relatively low level. The international ambitions of the University are hampered by at least two issues: the lack of funding for international mobility and collaboration, and the generally insufficient language proficiency. Together these two aspects lead to insufficient networking with international partners. The lack of funding makes it difficult for staff members to participate in international conferences, which are typically the first steps in creating international networks. The lack of foreign language proficiency, notably English, amongst most students and staff is perhaps the biggest obstacle for the University's internationalisation objectives. Conducting international collaborative research, and disseminating research results, which is the key to recognition as an international research university, will require the staff to have much higher proficiency in the English language.

The University has acknowledged this challenge and has taken steps to remedy the situation by first providing English courses to its staff members and students, partially with the help of multinational companies operating in Kazakhstan, such as Chevron. However, the Team understood that most students only receive one semester of English language teaching free of charge. The very limited range of mobility options for students and staff was also mentioned in the interviews conducted by the Team. Similarly, the Team understood that in cases of students completing study periods abroad, there are no established procedures for the academic recognition of those studies.

3. Capacity to change

The KazNTU is in the middle of a challenging transition period. As a relatively wealthy country with an abundance of natural resources, Kazakhstan is likely to have a louder voice in the international affairs in the future. This carries with it a greater responsibility to contribute to the international context. The universities of Kazakhstan will play an important role in developing this louder voice for the country, in a context where high technology and skills determine the fortunes of any nation. Kazakhstan higher education is changing as it moves towards a western higher education model, and compatibility with the Bologna Process.

For the present, however, the University still faces a rather restrictive operational context. Internally the University aims to change from a primarily teaching-oriented to a research-intensive institution, and to gain a special research university status from the Ministry of Education and Science, along with further resources it could allocate for research activities. It is also trying to build itself an international profile. The Team strongly support KazNTU's aspirations of becoming a more research-intensive and internationally oriented university, while modernising its education to meet the needs of the 21st century labour market, and collaborate closely with national and multinational employers in the Almaty region and the entire Kazakhstan state. In such a transition period, the University is making ambitious plans and has a commendable drive to move forward.

The constraints, challenges and strengths set in the operational context of the current organisational practices of the University have been discussed above. Some of the strengths of the University are only partially developed and this capacity for further development provides the potential to enhance the University's overall capacity for change.

As a national university, the KazNTU is already privileged amongst Kazakhstan higher education institutions, with a good reputation and a relatively stable funding base. If the University achieves the research university status it has applied for, this will further enhance the funding from the government. It is unlikely, however that this extra income on its own will be sufficient to allow the University to achieve its ambition to be a research-intensive university with an expanded international research base. To achieve the goals it has set, it will be necessary for the University to exploit its new status to develop further income streams. It will also be vital for the University to be able to recruit competitive staff globally, and the Team hopes this would also be facilitated by the research university status. One of the opportunities is for the University to further enhance the collaboration with multinational companies and national research institutes and other research funding bodies, and to use this to increase the scope of contract research.

However, the University owns some valuable research facilities, which have a great potential to help the University to take significant steps forward, if managed carefully. The existence of facilities such as the supercomputer, and the TechnoPark on campus, will allow many areas of research to be done by the University, which otherwise would not be possible. As a research intensive university, KazNTU will have expertise and facilities to sell advanced services to generate extra income streams.

These developments may increase the University's capacity to change. However, in order to achieve such ambitious targets, there will need to be some relaxation in the controls over the University's capacity to further exploit its entrepreneurial activities. Similarly, these new developments mean a cultural change and a significant effort of persuasion and motivation will be required before this new vision is shared by the University community. In order for the university to be able to establish itself as a research university, it will need to adopt a proactive, strategic approach to its own development, throughout all levels from top management to basic units and individual researchers. It is also important for the University to identify and foster talent at all levels of the organisation, and across the different tasks, from knowledge production to strategic management. The shared feeling of ownership of the change process at the level of students and individual staff members is important.

4. Recommendations

In the following, the team would like to offer some recommendations on how the University could make use of its strengths and alleviate its weaknesses by reconsidering some of its internal processes, and thus take significant steps towards achieving the goals it has set for itself.

4.1. Governance and management

Learning from best practice

The University should consider establishing an ongoing benchmarking exercise with three to four equivalent higher education institutions worthy of emulation. This way the University would be able to learn from the best practice.

Closer collaboration of knowledge producing units

In order to facilitate the closer collaboration of the different knowledge-producing units at the university, and to ensure an efficient management of resources, the University should consider regrouping the existing institutes and research centres within a given thematic area into a single structure, with strong administrative and research support. The management of such structures should be coordinated to avoid duplicating infrastructures and to facilitate the mutual exchange of research and teaching.

Streamline governing bodies and develop institutional autonomy

The University governing bodies (Academic Council, Scientific Research Council and the Academic and Methodological Council) and the central administration units seem to have overlapping tasks and unclear competencies. The University should therefore consider streamlining the governing bodies, and redefine the competencies of the central administration units. The University should consider moving to a system of two governing bodies, a small strategic body, and an academic body primarily responsible for the quality of education and research. These should contain the representation of the relevant groups of the university community, including students.

However, it was unclear to the team whether the scope and composition of governing bodies, or some of the other elements of the university governance and management are within the independent competence of the University. Therefore, the Team would recommend that the University considers applying to the Ministry of Education and Science to become a pilot institution for developing further institutional autonomy¹.

Develop data collection and analysis to support management

In order to maximise the effectiveness of its decision making processes, the University needs to develop systematic data collection regarding its academic and financial performance. A

¹ Further information on the EUA work on university autonomy can be found here: <http://www.eua.be/eua-work-and-policy-area/governance-autonomy-and-funding/projects/university-autonomy-in-europe/>.

culture of systematic self-analysis is also necessary for the University to be able to monitor the achievement of its goals.

Develop Quality culture

In order to be able to continuously improve its activities, the University should foster within the institution an overall quality culture²: this includes continuously monitoring its activities with the objective of improving them, and taking the necessary steps when it seems that set objectives and indicators are not being met. This requires the University to adopt a proactive approach to its strategic development and improvement.

4.2. Teaching and learning

Expand and further incentivise pedagogical training

The University should, as necessary, expand the opportunities for teachers to develop their teaching competencies, and offer pedagogical training. There should be further incentives for teachers to develop their pedagogical skills, for example by taking pedagogical training into account in salaries and promotions. Participating in pedagogical training should be taken into account in counting the annual teaching load of the teachers.

Reduce contact hours for students and modernise curricula

The University has already taken steps to modernise its curriculum to better respond to the needs of the changing labour market, within the limited possibilities offered by the nationally set educational standards. We recommend that the University continues, in collaboration with the relevant national bodies and employers, to develop more flexibility in the curriculum. In order to do so, the University might consider applying to the Ministry of Education and Science to become a pilot institution for curriculum development.

In modernising curriculum, attention should be paid especially to moving from teacher-centred teaching to student-centred learning³ and acquisition of relevant skills and competencies, according to the principles of the Bologna Process. The basis for independent learning and the skills for “learning to learn” should be established during the first year of studies, after which the students should be directed to do more independent study, in order for them to acquire the independent problem-solving skills required by the 21st Century labour market.

The expansion of secondary education should, in the future, help the University in this task. The students coming to the University will be older and more mature. Some of the disciplines currently taught under the general disciplines at the university may be moved to the expanded secondary education, thus freeing more time for developing university level professional and transferable skills. Adopting new learning technologies may also facilitate

² An example of the definition of quality culture can be found for example on the EUA website: <http://www.eua.be/eua-work-and-policy-area/quality-assurance/projects/eqc/>.

³ See for example: <http://www.esu-online.org/resources/6068/Student-Centred-Learning-Toolkit/>.

the move towards more student-centred learning, and the Team recommends the University to consider further adoption of such technologies.

Establish systematic quality procedures

The University has already taken several steps towards ensuring the quality of its various activities. However, the University seems to lack an overall concept of what counts as quality in its different areas of activity, on the basis of which quality-improvement measures should spring. To be able to follow, and continuously improve the quality of its education, the University should prepare, in cooperation with relevant bodies within the University systematic quality procedures. Quality Assurance lies at the heart of the Bologna Process, and as a part of that, a set of guidelines has been prepared in collaboration with European universities and other higher education institutions, students, and quality assurance bodies. We hope that the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)*⁴, which provides a framework of an agreed set of standards, procedures and guidelines on quality assurance, may be of help to the University, and strongly recommend that the University follow these principles in developing its own quality assurance system.

4.3. Research

Attract and retain the best talent

The University should strive to attract and retain the best talent in all levels of its activities and operations. This is especially crucial for the University in its aim to expand the number of its MSc and PhD programmes and students. The University could explore possibilities for funding students who wish to pursue research degrees. There are different methods of doing this, such as establishing a strategic fund to support promising PhD students with scholarships, or to employ them as research assistants, and thus integrate them into existing research groups whilst offering financial support to their studies. Care must be taken, however, not to overload them with teaching responsibilities.

Develop support for PhD students

The University should consider putting in place sufficient support systems, including unified information and support services, for PhD studies. This service should provide students with information about mobility and funding opportunities, but also assist them to make use of such opportunities, for example by helping them to acquire skills to write grant proposals.

The University should also endeavour to develop a policy regarding the organisation of PhD education, in order to ensure the quality of supervision, and the acquisition of relevant skills and competencies. PhD programmes should offer a chance for students to develop their skills not just in research, but also to make progress in various other transferable skills, such as pedagogical and project management skills.

⁴ The guidelines can be found here: [http://www.enqa.eu/files/ESG_3edition%20\(2\).pdf](http://www.enqa.eu/files/ESG_3edition%20(2).pdf).

Reduce the obligatory teaching load

The academic staff has a large annual teaching load, leaving little uninterrupted time for research. The Team recommends that the University strives to create more flexibility in the working schedules of staff to enable them more research time. This can be done for example by dividing the year into time periods and designating one period per year for research for each member of staff. Enabling productive staff to have more time for research and fewer teaching obligations would facilitate the move of the University in a more research-intensive direction. It is necessary, however, that the rules for dividing teaching load and research time are made public and transparent.

Facilitate and incentivise research work

The University is undergoing a considerable transformation from a primarily teaching-oriented to a more research-intensive institution. The University should endeavour to support an incentivised cultural shift in this direction, for example by redistributing teaching and research loads, further developing the policy of offering bonuses to research active staff, and facilitating staff access to the research facilities available at the University. The criteria for the staff to join the research centres should be public and transparent. Care must be taken, however, not to impinge on staff morale with unreasonable demands: establishing a research-intensive university requires that a feeling of ownership of the process is widely shared, and that genuine opportunities to expand individuals' research activities are offered.

4.4. Resources

Develop analytical accounting and overhead policy

The team suggests that the University urgently develops its capacity for analytical accounting and full costing⁵ of all its activities, to be able to make a realistic budget and to plan ahead. Numerous studies done around the world have shown that the indirect costs of university activities are around 75% percent on top of the direct costs. As the research-intensity of the University increases, these costs may become a matter of significant importance. The Team recommends that the university should therefore develop a realistic policy of collecting overheads for its research projects.

Develop policy for internal funding allocation

The Team recommends that the KazNTU should consider developing a policy on the meaningful division of externally generated funds between the earning unit and the central level. This strategic issue should not be decided on case by case basis, but a coordinated and transparent policy should be implemented. The policy should ensure that the University recovers at least some of the cost of the general facilities and services it provides for the earning units, guarantee that costly research facilities are maintained and upgraded, but also incentivise the earning units to further develop their entrepreneurial activities.

⁵ A recent EUA project on full costing of universities can be found here: <http://www.eua.be/eua-projects/current-projects/euima/euima-full-costing.aspx>

Facilitate entrepreneurial activities

The University should endeavour to develop a proactive approach to facilitating the entrepreneurial activities by staff and research units. While services in patenting and commercialising innovation are already provided through the TechnoPark concept, the University should consider doing this on a more proactive basis. The entrepreneurial, income-generating activities of the staff should be rewarded, while making sure that the university has adequate intellectual property rights policies in place.

Develop partnership with the Ministry to increase financial flexibility

The restrictive line-item budget is one of the significant drawbacks for the University's strategic development, and it allows little flexibility for the institution to develop its research capacity. The Team recognises that the public funding system is dependent on national legislation. We therefore encourage the University to establish a partnership with the Ministry of Education and Science, potentially as part of the pilot project on increased university autonomy, to drive forth a change towards more flexibility in university funding. As a research university, KazNTU may also be able to apply to the authorities to be able to keep more of its self-generated resources.

Strengthen capacity for strategic research

Using the funding generated by collecting overhead from research contracts, the University should consider creating a strategic fund for developing curiosity-driven and strategic research, where resources would be available on competitive basis for the best, top-quality research ideas. Funding could also be made available for the early stages of developing large research projects and grant applications.

Improve facilities

Up-to-date facilities for research, teaching and learning contribute to the well-being and job satisfaction of both the staff and students. Once financial obstacles are reduced, the University should bring all of its facilities up-to-date, including providing more and higher-standard dormitories and sport-facilities, and ensuring that disabled access to the university premises is created.

4.5. Internationalisation

Improve the English language proficiency of staff and students

Internationalisation is one of the ambitions of the University, and the Team notes that it has already taken some steps to enhance its international collaboration, both in education and research. However, all internationalisation activities are dependent on the ability of the staff, and students, to communicate in foreign languages, most notably English, and thus the Team recommends that increasing the language proficiency is the key to the University achieving these international ambitions. The University should offer intensive English language courses for staff and students free of charge. If the University develops its capacity to offer English Language courses, it may in the future also provide the University an additional opportunity

to generate income by teaching the staff of other higher education institutions or organisations.

Facilitate staff and student mobility

The basis for expanding internationalisation at KazNTU lies in increased staff exchanges and international collaboration. The University should consider establishing a sabbatical system to encourage the staff to spend longer periods working in foreign higher education institutions. On the other hand, research collaboration, and the resulting reputation of the University, will be important for its ability to attract foreign degree and exchange students. The staff going abroad e.g. to attend conferences, could be encouraged to network with foreign universities, for example by providing them with information material about the University to disseminate. The University should also expand efforts to establish bilateral exchange programmes for staff and students, offer financial support for mobility, and establish systematic procedure to implement learning agreements⁶. These detail the course units to be completed abroad and commit the sending and receiving institution to ensure recognition of study periods abroad.

Provide better international services

The University should consider extending the remit and capacities of the existing international office to provide guidance for KazNTU staff and students about mobility opportunities, but also to provide services for incoming international students in settling in at the institution. It could also consider adjusting the remit of the office to include offering Kazakh language courses for incoming international students, when necessary.

Use national contacts to establish international ones

Kazakhstan is on the verge of becoming a much more significant country in the global scale than it has traditionally been. The University could establish strategic partnerships and to seek assistance of the government to help establish links with international research universities in countries wanting to cooperate in Kazakhstan.

5. Conclusions

Coming to the end of the report, the Team would like to once more express our sincere thanks to the rector, staff and students of the KazNTU for their generous hospitality, and the excellent arrangements provided to make the two visits a pleasant, although a challenging and intensive experience. The Team hopes that this report will contribute to the internal process of making the University an even better institution, and to help it achieve the ambitious goals it has set for itself in the Development Strategy 2020.

⁶ An example of a learning agreement used in the Erasmus exchange programme can be found through this link: ec.europa.eu/education/erasmus/doc/learningform_en.doc

Appendix: Interviews conducted by the IEP Team during the visits

First visit

Rector

Zheksenbek M.Adylov, Doctor of Economic Sciences, Professor

Liaison

Gulnara M.Sarsenbayeva, Candidate of Pedagogical Sciences/PhD, Director, Department for Strategic Planning and Development

Shynybai Baisbekov, Doctor of Technical Sciences, Professor, First Vice rector, Vice rector for Educational and Methodological Affairs, Head of the Self-Evaluation Team

Anvar Saparov, Candidate of Technical Science/PhD, Director, Department of Educational Affairs, Secretary of the Self-Evaluation Team

Self-Evaluation group

1. I. Duisembayev, Doctor of Technical Sciences, Professor, Vice rector for Research and International Relations
2. S. Zhusupbekov, Candidate of Technical Sciences, Associate Professor, Vice rector for Academic Affairs
3. K. Mukanov, Doctor of Medical Sciences, Vice rector for Social Affairs
4. U. Sydykov, Doctor of Philosophical Sciences, Vice rector for Students' Affairs –
5. A. Saparov, Candidate of Technical Sciences, Director of Department of Educational Affairs
6. G. Mukhanova, Candidate of Technical Sciences, Director, Career Centre
7. A.N. Almasov, Director of Department of Research and International Relations
8. Zh. Otarbayev Doctor of Technical Sciences, Director, Institute of Distance Education
9. Zh. Kopbasarov, Candidate of Technical Sciences Deputy Director of International Institute of Postgraduate Study "Excellence Polytech"
10. A. Mustafina candidate of Technical Sciences, Director of IT Centre
11. M. Omyrserikov Doctor of Technical Sciences, Professor, Director Institute of Geological Exploration after K. Turysov
12. K. Rysbekov Candidate of Technical Sciences, Associate Professor, Director , Institute of Mining after A. Baikonurov
13. T. Ensepbayev , PhD, Director, Institute of Oil and Gas Engineering
14. P. Eserev, Doctor of Technical Sciences, Professor, Director Institute of Mechanical Engineering
15. A. Beisembaev , Candidate of Technical Sciences, Associate Professor, Director Institute of Automation and Telecommunications
16. S. Kumekov, Doctor of Physical and Mathematical Sciences, Professor, Director

Institute of HiTech and Sustainable Development after Al-Mashani

17. B. Mananov, Candidate of Economic Sciences, Associate Professor, Director Institute of Economics and Business
18. K.Nauruzbayev Doctor of Technical Sciences, Associate Professor, Director Institute of Architecture and Civil Engineering
19. M. Baibatshaev, Doctor of Technical Sciences, Professor, Director Institute of Information Technology
20. B. Baimbetov, Candidate of Technical Sciences, Professor, Director Institute of Metallurgical Engineering and Polygraphy after A. Burkitbaev
21. M. Omyrserikov, Doctor of Geological and Mineralogical Sciences, Professor, Director Institute of Geological Exploration - Dr. M. Omyrserikov
22. Zh. Otarbayev, Doctor of Technical Sciences, Professor, Director Institute of Distance Learning
23. S. Aidarova, Doctor of Chemical Sciences, Professor, Director Institute "Polytech Excellence" (Post Graduate Education)

Mining Institute

Dean

K. Rysbekov, Candidate of Technical Sciences, Associate Professor, Dean

Staff

1. A. Tsehovoi , Doctor of Technical Sciences, Professor, Head, Chair of Computing Technological Processes and Production
2. Zh. Baigurin, Doctor of Technical Sciences, Professor, Head, Chair of Mine Survey and Geodesy
3. A. Kurmankozhayev, Doctor of Technical Sciences, Professor, Head, Chair of Engineering Surveying and Land Management
4. B. Rakishev, Doctor of Technical Sciences, Professor, Head, Chair of Open Cast Mining
5. I. Stolpovskih, Doctor of Technical Sciences, Professor, Head, Chair of Transport and Mining Machinery
6. S. Rakhimbekov, Doctor of Technical Sciences, Professor Head, Chair of Development of Deposits of Minerals

Metallurgical Institute

Dean

B. Baimbetov, Candidate of Technical Sciences, Associate Professor, Director

Staff

1. T. Dauletbakov, Doctor of Technical Sciences, Professor, Metallurgy of Non-Ferrous Metals
2. M.Shautenov, Doctor of Technical Sciences, Professor, Metallurgy of Precious Metals and Enrichment

3. A.Baikonurova, Doctor of Technical Sciences, Professor, Metallurgical Processes and Technology of Special Materials
4. S. Mashekov, Doctor of Technical Sciences, Professor, Metallurgical Machinery and Equipment
5. Zh. Ibrayeva, Doctor of Technical Sciences, Professor, Machinery and Technology of Printing Industry
6. D.Smagulov, Doctor of Technical Sciences, Professor, Metallurgy and Thermal Processing of Metals
7. Z. Alibayev, Doctor of Technical Sciences, Professor, Chemical Technologies of Inorganic Substances

Institute of Geology

Dean

M. Omyrserikov, Doctor of Technical Sciences, Director

Staff

1. E. Akhmetov, Candidate of Geological and Mineralogical Sciences, Associate Professor, Head, Chair of Geophysics
2. E. Koldeyev, Candidate of Technical Sciences, Associate Professor, Head, Chair of HydroGeology and Engineering Geology
3. A. Kasenov, Candidate of Geological and Mineralogical Sciences, Professor, Head, Technology and Technique of Drilling Wells
4. A. Zhunusov, Candidate of Geological and Mineralogical Sciences, Professor, Head, Chair of Geological Mapping and Exploration of Minerals
5. A. Baibatsha, Doctor of Technical Sciences, Professor, Head, Chair of General Geology, Mineralogy and Petrography

Institute of Oil and Gas Engineering

Dean

T. Ensepbayev, PhD, Director

Staff

1. E. Akkazin, Candidate of Technical Sciences, senior teacher, Deputy Director
2. B. Myrzakhmetov, Candidate of Technical Sciences, Professor, Head, Chair of Machines and Equipment of Oil and Gas Fields
3. G. Eligbayeva, Doctor of Technical Sciences, Associate Professor, Head, Chair of Chemical Technology of Processing of Petroleum, Gas, and Polymers
4. B. Kumar, Candidate of Technical Sciences, Associate Professor, Head, Chair of Projecting, Construction and Exploitation of Gas and Oil Pipelines

External partners

1. O Vasilevskii, Rector, Corporate University "Kazakhstan Nuclear University", National company Kazatomprom Corporation

2. A. Panichkin, Vice-President of Corporation "Research Centre for Earth and Metallurgy"
3. M. Tsipkin, Director "Metal" Corporation

Second visit

Rector

Zheksenbek M. Adylov, Doctor of Economic Sciences, Professor

Liaison

Gulnara M. Sarsenbayeva Candidate of Pedagogical Sciences/PhD, Director Department for Strategic Planning and Development

Shynybai Baisbekov, Doctor of Technical Sciences, Professor, First Vice rector, Vice rector for educational and methodological affairs, Head of the Self-Evaluation Team

Anvar Saparov, Candidate of Technical science/PhD, Director of Department of Educational Affairs, Secretary of the Self-Evaluation Team

Scientific Research Council

1. I. Duisembayev, Doctor of Technical Sciences, Professor, Vice rector for Research and International Relations
2. B. Rakyshev, Doctor of Technical Sciences, Professor, Head, Chair, Institute of Mining after A. Baikonurov
3. G. Zholtayev, Doctor of Geological Sciences, Professor, Institute of Geology
4. A. Myrzakhmetov, Doctor of Technical Sciences, Professor, Head, Chair, Institute of Construction Engineering
5. K. Abdullin, Doctor of Technical Sciences, Professor, Director, Open Engineering Laboratory
6. K. Altybai, Doctor of Technical Sciences, President, Technopark
7. G. Zhunusova, Doctor of Technical Sciences, Associate Professor, Director, Research Centre
8. Zh. Otarbayev, Doctor of Technical Sciences, Professor, Director, Institute of Distance Education
9. M. Omyrserikov Doctor of Technical Sciences, Professor, Director, Institute of Geological Exploration after K. Turysov
10. T. Ensepbayev, PhD, Director, Institute of Oil and Gas Engineering
11. P. Eserev, Doctor of Technical Sciences, Professor, Director, Institute of Mechanical Engineering
12. A. Beisembaev, Candidate of Technical Sciences, Associate Professor, Director, Institute of Automation and Telecommunications
13. S. Kumekov, Doctor of Physical and Mathematical Sciences, Professor, Director, Institute of HiTech and Sustainable Development after AI-Mashani
14. B. Baimbetov, Candidate of Technical Sciences, Associate Professor, Director, Institute

of Metallurgical Engineering and Polygraphy after A. Burkitbaev

Academic and Methodological Council

1. S. Baisbekov, Doctor of Technical Sciences, Professor, First Vice Rector, Vice rector for Educational and Methodological affairs, Chairman
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6. Zh. Otarbayev, Doctor of Technical Sciences, Director, Institute of Distance Education
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10. R. Sadkbayeva, Associate Professor, Head, Educational and Methodological Affairs
11. A. Turdaliev, Doctor of Technical Sciences, Director, Department of Organization of Academic Affairs
12. M. Kerymzhanova, Candidate of Technical Sciences, Institute of Machine Building
13. S. Kumekov, Doctor of Physical and Mathematical Sciences, Professor, Director, Institute of HiTech and Sustainable Development after AI-Mashani
14. P. Eserev, Doctor of Technical Sciences, Professor, Director, Institute of Mechanical Engineering
15. B. Baimbetov, Candidate of Technical Sciences, Professor, Director, Institute of Metallurgical Engineering and Polygraphy after A. Burkitbaev
16. U. Zhanbyrbaeva, Candidate of Physical and Mathematical Sciences, Associate Professor
17. T. Zharkymbekov, Candidate of Technical Sciences, Associate Professor, Director, Office Registrar

Research Institutes and Central Service Departments

1. K. Altybai, Doctor of Technical Sciences, President, Technopark JSC.
2. E. Pshenin, Candidate of Physical and Mathematical Sciences, Director, Research Centre Problems of information security
3. Kh. Abdullin, Doctor of Technical Sciences Director, Open Engineering Laboratory
4. G. Zhunusova, Doctor of Technical Sciences Director, Research Centre Innovations and Commercialization of Technologies
5. G. Mukhanova, Candidate of Technical Sciences, Director, Career Centre
6. A. Almazov, Doctor/Candidate of Technical Sciences, Director, Research and International Cooperation Department
7. B. Pavlikova, Director, Department of Financial Accounting

8. I.Tursunov, Master of IT, Director, Research Centre: National Scientific Laboratory of IT and Space Technologies
9. A. Tatenov, Candidate of Physical and Mathematical Sciences, Professor, Director, Sciences Research Centre: Kazakh-Korean Educational Centre of IT and Communication Technologies
10. N. Aliaskarov, Head, Personnel Department