DEVELOPMENT OF STRATEGIC DIRECTIONS FOR EDUCATION REFORMS IN KAZAKHSTAN FOR 2015–2020

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The final report on the first phase (2013) of the "Development of the strategic directions for education reform in Kazakhstan for 2015-2020" project was implemented by the Graduate School of Education at Nazarbayev University on behalf of the Ministry of Education and Science of the Republic of Kazakhstan. The purpose of this research is to conduct a diagnosis of the education system of the Republic of Kazakhstan in order to identify the strengths and weaknesses of the educational system and the subsequent identification of areas for further modernization at each level.

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ABBREVIATIONS

AEO	Autonomous Educational Organisation
AGB	Association of Governing Boards for Universities and Colleges
CEFR	The Common European Framework of Reference for Languages
CPD	Continuing Professional Development
CT	Complex Test
CUC	Committee of University Chairs
EAU	European Universities Association
EU	European Union
ECTS	European Credit Transfer and Accumulation System
GDP	Gross Domestic Product
HEA	Higher Education Authority
HEFCE	Higher Education Funding Council of England
HEI	Higher Education Institution
HRD	Human Resources Development
ICT	Information and Communications Technology
IGCSE	International General Certificate of Secondary Education
ILO	International Labor Organization (ILO)
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ISO	International Organization for Standardization
MES	Ministry for Education and Science (Kazakhstan)
NCESE	National Center for Educational Statistics and Assessment
NESS	National Education Storage System
NIS	Nazarbayev Intellectual School
NU	Nazarbayev University
OECD	Organisation for Economic Co-operation and Development
PE	Private entity
PISA	Programme for International Student Assessment
PSO	Pre-school organisations
R&D	Research and Development
SABER	Systems Assessment for Better Education Results
SME	Small and Medium-sized Enterprises
SPED	State Programme of Education Development
TEA	Tertiary Education Authority
TIMSS	Trends in International Mathematics and Science Study
TVE	Technical and Vocational Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	The United Nation's Children Fund
UNCRC	United Nations Convention on the Rights of the Child
UNEVOC	International Center for Technical and Vocational Education and Training
UNT	Unified National Test
WB	World Bank

Executive summary

The development of the education system is a priority for Kazakhstan, as investment in education is key to the well-being of society as a whole. Education, which constitutes a major investment into human capital, is also a key driver of economic growth. In an integrated dynamic global market place, education systems must continually improve and work to adapt to changing circumstances. The State Programme of Education Development in the Republic of Kazakhstan for 2011- 2020 (SPED) is the foundation document driving education reform in the country. Although the SPED states that "in 2015, the transition period will be completed, and the education system of the Republic of Kazakhstan will correspond to the models of developed countries in its structure, content, management and financing mechanisms", no clear vision has been established for the second stage of this development for 2015 to 2020.

This diagnostic report provides an analysis of the problems that the Kazakhstan system of education needs to address in the next stage of its development and is offered as a step towards this goal.

Pre-school education

Although there has been impressive growth in the provision of pre-school education, it is unevenly distributed across urban and rural areas and inaccessible to a substantial number of rural children and families. Furthermore, high demand for an insufficient number of pre-school places has created corrupt practices in the registration of children. There is also great concern regarding the increase in the number of private kindergartens being set up outside of the formal licensing process and with relaxed inspection procedures.

Much focus has been placed on the quantity of pre-school places yet this has not been matched by an equally attentive focus on quality. Thus, other issues for concern in pre-school education in Kazakhstan include: the poor quality of teacher training; the lack of high quality teaching staff[1]; the low recruitment rates of the pre-school training programmes in pedagogical institutes; the slow development of inclusive education in early years (less than a third of young children with special needs have access to pre-school education) (MES, 2010); the lack of support in offering a trilingual programme (Kazakh, Russian and English); and the dearth of training and mentoring programmes designed for its implementation.

The current perceptions of pre-school education need to change where it should not only be preparation for formal schooling after age six, but a veritable stage in the education process. Over the years, the concept of a child has shifted from the image of an empty vessel to the image of a powerful *learner from birth*. Alongside this growing understanding of the 'powerful child' has come a renewed focus on *learning* (what children do best). Teachers consider with great care what shapes and fosters this learning, and how they can best cherish and sustain it. In Kazakhstan, official documents refer to current areas for concern, including the recruitment of well-qualified trainees, low salaries and lack of prestige, long working hours, overload and external pressures, as well as the lack of appropriate continuing professional development. These issues must be resolved, but approaches to their resolution need to be framed by a new understanding of what pre-school education should be like.

1 There has been a significant increase in the level of training of teaching staff: the proportion of educators with higher education was 42% in 2005 rising to 55.4% in 2010, and 57% in 2012, although there is considerable scope for further improvement.

Some of the buildings used for pre-school education are unsuitable, lacking the most basic facilities, suitable equipment, opportunities for outdoor learning or access for children/adults with disabilities. In many countries, pre-school education buildings are no longer exclusively dedicated to education, but have developed as integrated multi-service centers for young children and their families, incorporating health services, speech therapy, social care, and adult learning opportunities. This is a possibility to be carefully considered in the shaping of the new forms of pre-school organisations.

Secondary education

In secondary education, in spite of many initiatives and a strong will to reform, the current plans are poorly co-ordinated, insufficiently ambitious and lack an understanding of the educational principles and practices that need to be applied if Kazakhstan is to move forward nationally and onto the international stage in the way in which it seeks.

Curriculum, assessment, textbooks, pedagogy, teacher training and school leadership all have to be developed together in a co-ordinated way with careful synchronisation. These aspects need to be informed by the same goals and values or they will undermine each other[2].

National standards, subject programmes, pedagogy and textbooks need to be revised with a view to setting expectations for the development of more challenging intellectual function – comparing, analysing, applying, critiquing, inquiring, explaining, arguing – not just memorising and recalling.

Unified National Testing (UNT), being one of the most powerful and dysfunctional elements of the education system in Kazakhstan, needs to be revised radically to ensure that it is testing the variety of intellectual tasks that the country (and the higher education system) should require of students. It should employ a wider range of contemporary assessment methods and provide a broader profile of students' achievement across a range of subjects and accomplishments.

In the education sphere, there is a lack of agreement on what is meant by "trilingualism" and trilingual education; and, little is known of the results that have been achieved by students in various types of trilingual education programmes elsewhere in the world and how this was accomplished. Current planning is underway with insufficient knowledge about trilingual education, and based partly on some false assumptions.

The levels of fluency to be achieved in Kazakh, Russian and English are insufficiently and inconsistently defined. Furthermore, curriculum goals are not fully aligned with the trilingual goals, and assessment of language learning is not aligned with curriculum intentions. These factors make it difficult to plan, among others, for curriculum and textbook development, and for teacher pre- and in-service training. Stakeholders in trilingual education are not co-operating sufficiently to achieve current government targets.

Equity and Inclusion

In spite of many efforts to ensure equity in education, children attending rural schools remain at a significant disadvantage compared with those attending urban schools. In particular, this is due to the requirements of investment in infrastructure, resources, and teacher development and a more

2 In identifying, briefly, these interdependent elements of an educational system we have also indicated what international evidence (Darling-Hammond, 2010; Hattie, 2012; Levin, 2008; Mourshed et al. 2010; Stobart, 2008) suggests are key levers for change, the most powerful perhaps being (high-stakes) assessment; teacher education and leadership at both the school level and in the wider administrative and support structure.

equitable approach to school finance. Current approaches to school finance puts schools, and hence children in poorer areas, at a disadvantage. Even the proposed per capita approach to funding will risk perpetuating this source of inequality unless it includes ways of addressing the particular difficulties facing small rural schools.

There is a complex interaction between rurality, the first language of children, and the language of instruction in schools that needs to be better understood. Both in urban and rural areas students taking the UNT in Russian seem to perform better than those taking it in Kazakh according to UNT and scores of the OECD's Programme for International Student Assessment (PISA). There are disadvantages for those educated in a language other than Kazakh or Russian, such as, for example, the impossibility of taking the UNT in their own language. One symptom of underlying inequalities is seen in young poorly qualified Kazakh males who drift into towns, fail to find employment and become disaffected. This has been identified as a social problem that requires an urgent educational response.

Children growing up in the state-run residential institutions are facing high risks of stigmatisation, unemployment, and poverty.

The education system fails to provide adequately for children with special needs through the implementation (to the extent possible) of inclusive education. Issues include inaccessible buildings, inadequate learning support and teachers who are unequipped to understand or meet the needs of these children. There are no funding mechanisms to support the inclusion of children with special needs into mainstream schools. The new funding formula "grants for better performance" is designed to reward schools for the number of students obtaining good UNT results and medals. Such bonus systems tend to reward the already advantaged population, the school's previous achievements and successful student intake yet they tend to disadvantage others.

Teachers and Teacher Education

The teacher salary structure in the "*stavka"* system is fragmented, complex and difficult to administer. Teacher salaries need to be increased to place them above the national average rather than below in order to attract quality candidates. System efficiency indicators such as the student to teacher ratio are very low (average ratio 8.2). This requires careful analysis, and possibly, revision of school staffing norms and school network rationalisation.

With regard to teacher education, there are serious issues related to attracting, recruiting, selecting and preparing high quality candidates to teach in Kazakhstan. Teacher education needs to be reformed urgently and systems along the teacher's career path need to be aligned in order to improve teachers' professional learning and development. Clear standards are needed that correlate to the vision of the teacher, the school and professional learning – and the application of these standards to the development of the teacher's education curriculum and to student/teacher assessment.

Infrastructure and Resources

Infrastructure is a major issue as many school buildings are unfit for purpose – as judged even against current standards of health and hygiene as well as educational functionality. Many existing schools lack the facilities and resources to provide a proper learning environment for e.g. the kind of practicals that are required or should be required if students are to learn to apply knowledge and learn to investigate natural phenomoenon for themselves; for work in the arts or for physical education. The Nazarbayev Intellectual Schools (NIS) schools are setting new national standards that are far out of reach of ordinary schools, although the NIS curriculum is still expected to be integrated into the mainstream.

Management of Change

Finally, a more strategic approach needs to be adopted to introduce change. Greater attention needs to be paid to interacting elements of the system (e.g. assessment, curriculum, and teacher training) as they are developed and integrated throughout the education system. Those in key managerial positions in schools Rajon, Oblast and the Ministry need training in the management of the enormous changes that are underway in Kazakhstan and that are presaged in this report.

Technical and Vocational Education (TVE) and Training

The vision statement of the SPED for 2011-2020 should contribute to outlining the strategic objectives. The vision statement, which currently refers to the "achievement of the highly qualified labour force", should be converted into a set of measurable strategic objectives describing desirable features of "the highly qualified workforce" to be achieved by 2020. The TVE-related objectives of this Programme should be refined so as to directly contribute to achieving the vision. Linkages between the Programme's vision, the TVE's strategic objectives, and the TVE system modernisation's target indicators should be critically reviewed. The TVE development strategy for each of the Programme's strategic objectives should be designed.

A structure of the SPED, while focusing on numerous activities, does not emphasise some of the principle policy issues raised by the international Human Resource Development (HRD) Conventions and Recommendations adopted by the International Labor Organization (ILO), United Nations Educational, Scientific and Cultural Organization (UNESCO), and European Union (EU) documents. Such areas of international focus are:

- relevance of TVE: (a) to the demand of the population (for personal development and social integration with education, training and employability of youth being a priority), (b) to stakeholders' expectations (governments at all levels, employers and unions, students, communities, etc.), and (c) to labour market needs (industries, regional economies, employers);
- equality of access to education, training and employment opportunities;
- quality of TVE delivery (to ensure equal access to "quality education");
- efficiency of TVE systems and institutions (utilisation of resources in producing outcomes).

The national TVE policy development and monitoring processes do not clarify the major intentions in developing TVE, taking into account the interests and determining responsibilities of all the stakeholders, including national and regional authorities, ministries, sector and regional councils, TVE providers, etc. Consequently, the inequality of the stakeholders involved in TVE policy development weakens TVE governance. There is no set of agreed processes for stakeholders to committedly contribute to TVE policy-making, funding, quality assurance, development of qualifications, on-the-job training and student assessment.

Equal access to education, training and employment opportunities is a fundamental international policy objective highlighted in all HRD Conventions and Recommendations of the ILO, UNESCO and the documents of the EU. The ILO HRD Recommendation 195 stated that its "members should: (a) recognize their responsibility for education and pre-employment training and, in cooperation with the social partners, improve access for all to enhance employability and to facilitate social inclusion" (ILO, 2004, p.6). The SPED in Kazakhstan however treats equality as a way of "ensuring equal access of all the participants to the educational process, and to the best educational resources and technologies" (MES, 2010).

International HRD policy documents recognise that technical and vocational education contributes significantly to the personal development and social integration, particularly of young people, resulting in meaningful private and social benefits. This means that TVE should be provided not only at the demand of the labour market but also at the demand of (young) people. The agreement with the international HRD recommendations is expressly confirmed in the Law on Education of the Republic of Kazakhstan (LERK, 2007, Article 3) that states that education aims to ensure personal and social development.

The qualification descriptors adopted in Kazakhstan in 2012 followed the descriptors of the European Qualifications Framework. However, the format adopted in Kazakhstan referred only to the qualification levels rather than to the types of national qualifications leaving some important aspects unspecified. First, the national qualification system does not provide names of qualifications and their descriptions. Second, the qualification system does not suggest the nominal duration of learning programmes corresponding to the achievement of different qualifications. Third, a concept is promoted that the national qualification system should exist along with the qualification systems of the industry sectors where national qualification levels can be/will be split into various numbers of sub-levels depending on the industry sector specificity. This approach goes against the intended benefit of having the agreed types of national qualifications based on the agreed number of national qualification levels. It is expected that industry sectors should actively participate in the development of occupational standards and qualifications. However the national occupational standards development processes seem to be lacking uniformity and co-ordination. The development of occupational standards for mass trades needs to be assigned to national expert panels agreed upon by the concerned industry sectors, while individual industry sectors should be made responsible for the development of standards only for the occupations which are sector-specific. There should be a national validation process in place to assure the quality of standards and qualifications developed by industry sectors.

Most of the public TVE institutions, except for the few subordinated to the national government, are supervised by regional TVE departments of the Akimats. TVE regional departments, however, are understaffed while being responsible for very large numbers of public colleges and at the same time providing guidance to private TVE institutions. Principle functions of the regional TVE department involve college licensing, director appointments, planning and funding of TVE enrolments (within the so-called state order), and monitoring delivery. Staff in the regional TVE departments need to be knowledgeable regarding equal access to TVE, understand the current and future regional demand for educated and skilled workforce, capable of working with other departments and the regional statistical offices in order to make a case to develop and modernise the regional TVE systems.

Regional TVE participation rates of the 14-24 age group, which is the major potential beneficiary from technical and vocational education, ranges from between 9.4% to 20% thereby reflecting regional disparities in the availability of enrolment opportunities in the public and private TVE providers as well as the differences in students' ability to privately finance their technical education. On average, 54.8% of youth has to privately finance their technical education. In some regions, there are over 65% of fee-financed TVE students aged 14-24.

There are also considerable disparities between regions in their funding of TVE in:

- TVE participation rates of the 14-24 age group (ranging from 9.4% to 21.8%);
- the share of TVE students aged 14-24 funded from regional budgets (ranging from 32.7% to 70.8%);

- average funding rates of the full-time student-year applied in the budgetary funding by regional governments (ranging from KZT 164 000 to KZT 442 000);
- average fee rates applied in the regions which seem to reflect the varying abilities of students to finance their technical education (ranging from KZT 80 000 to KZT 280 000).

TVE in Kazakhstan is responsible for preparing and maintaining some 75% of the total labour force. The major structural problem of the national labour force is that 24.4% of jobs do not require any identifiable knowledge and skills (Group 9 of the International Standard Classification of Occupations (ISCO-08), with more than half being unskilled workers in industry, construction, mining and other technology-related sectors of the economy. The other half of unskilled workers come from services, sales, etc. This problem needs to be addressed by increasing the share of skilled workers, which could be accomplished by producing more workers and upgrading qualifications of the employed workforce. Similarly, there is a mismatch between the supply and demand in the labour force. The gathered data show that 20.4% of jobs in the labour market require higher education (managerial and professional jobs) while more than 33% of the economically active population are higher education (HE) graduates or with incomplete higher education, meaning the supply exceeds the demand by 1.7 times. This is also true with technician-level jobs. There are more than 3 times as many graduates at this level. Thus, 80% of skilled worker jobs in the labour market can be carried out either by graduate technicians, HE graduates or by people who graduated with a general education and have never been vocationally trained.

The SPED focuses on "quality assessment" rather than on "quality assurance" while many other countries focus on the latter. Planning quality-related activities needs to be based on the agreed national criterion of TVE quality. Several quality-related activities are listed in the SPED that aim to improve institutional accreditation, staff training, development of standards, etc. which would benefit by bringing them under a certain quality criterion. Increased involvement in TVE-related activities by regional TVE authorities, regional and sector councils, and various national bodies may result in the conflict of quality assumptions. The introduction of the national quality criterion will also impact on its rather narrow definition provided in the Education Act of Kazakhstan. However the recently proposed standards of accreditation are not based on any nationally agreed concept of TVE quality.

Accreditation is one mechanism to assure TVE quality and is expected to incorporate the current attestation of institutions. Accreditation will aim to assess compliance of TVE institutions as well as their education programmes with the so-called accreditation standards developed by the accreditation agencies. The SPED aims to have 10% of public colleges (49 institutions) accredited by 2015. In 2013, around 20 colleges should be accredited. However, recently proposed standards of accreditation were not based on any nationally agreed criterion of TVE quality. Moreover, the accreditation standards for institutions are not in line with the ISO 9001 and ISO 9004, which determine the international basis for the quality management and organisation systems and processes.

The Programme plans to have greater employer involvement in TVE by introducing the dual system, which combines class-based TVE with structured on the job training, contributing to the development of education programmes, qualifications and standards of all kinds, having employers participate on TVE institutions' boards, and training of TVE staff. It is expected that the so-called "co-operative learning will be widely implemented by 2020". The dual system, which is well-established in Germany, Austria, Switzerland, and Denmark, requires a set of certain important conditions to be successful. Some of these conditions are currently missing in Kazakhstan or need to be clarified, such as the length of on-the-job training in an apprenticeship system, the capacity of national industry to absorb apprentices, apprentice stipends as compared with the market wages of skilled workers. Thus,

the concept of public-private partnerships in TVE and the intended introduction of the dual system should be reviewed taking into account the core interests of industry stakeholders and trainees.

In the SPED (MES, 2010, p.19), training and upgrading of teaching staff is given high priority in order to provide the teaching profession a certain prestige and improve the quality of TVE. This would involve subject-specific teachers and vocational instructors who are planning to upgrade their qualifications through internships in enterprises. However, it is also important to recognise the need to establish regulations for practical instructors in Kazakhstan. So far, skilled workers from industry can be employed as instructors by TVE institutions without any pedagogical training. Having pedagogical knowledge is an important requirement in many countries where skilled workers and supervisors in companies are involved in training new workers. Those employed as a teacher and/or instructor should be trained and certified for doing so.

Higher Education and Research

This report develops six key policy areas grouped as priority issues.

Priority One: To improve performance and quality of tertiary education to globally competitive levels.

Provision, enrolment, progression: Following governmental measures to verify the proliferation of small poorer quality institutions, the number of higher education institutions (HEIs), especially private institutions, has been declining steadily since 2004/5, although private HEIs still constitute the majority. The absolute number of higher level students in Kazakhstan almost doubled between 1996 and 2005/6 but has since decreased by 26% – a decrease that can only be partially explained by a declining population. Surprisingly, this decline in enrolment has been heavily concentrated in public institutions. The largest drop in numbers was in extramural courses, whose quality was particularly poor. University enrolment rate in Kazakhstan is still well below most OECD countries, although not out of line with the average of countries of a comparable income level. Recently, rising dropout rates have been another source for concern.

Quality assurance: Kazakhstan has made progress towards implementing an institutional quality assurance system. By 2013, 3.6% of the total 139 HEIs had received full institutional accreditation and another 16.6 % are expected to reach that goal by the end of the year with approximately the same number of institutions receiving discipline-specific accreditation. Funding will be tied to accreditation (see below). However, there is reliance on centralised quality control and on compliance rather than a culture of quality assurance and self-evaluation at the institutional level.

Access and equity: The policy of reducing the number of HEIs appears to have had a disproportionate impact on Oblasts with a greater incidence of poverty. In addition, enrolment levels differ in rural and urban areas which may be attributed to the difficulties that graduates in rural areas, especially those from small schools, have in achieving the grades on the UNT, which is required for access to full-time higher education. In spite of the welcomed establishment of the National Qualifications Framework in 2010, there is no clear pathway from technical-vocational education (TVE) to higher education. Transfer and progression are thus unclear and in some cases impossible. There is extensive anecdotal evidence that the public continues to mistrust the quality of TVE, and that possession of these qualifications does not reduce the time required to obtain a degree.

Priority Two: Align higher education to meet the labour market needs of a rapidly changing, increasingly knowledge-based, technology-intensive economy.

Labour market: Graduate employment rates, based on estimates of less than 5% unemployment in 2011, appear to be relatively satisfactory. The structure of the labour force is that of a "middle income" country so it is probable that future economic growth will see a shift of labour into the secondary (industry and construction) as well as the tertiary (services) sectors. Developing technology and increasing globalisation will mean that all graduates must be prepared for changing skills demands and the requirement to continuously upgrade professional expertise. It is essential that at least the first university degree of any graduate provide the foundation on which later professional specialisations can be based and, through what is usually called "lifelong learning", be frequently updated. This report examines the mix of disciplines in which Kazakh students now graduate and raises questions about their readiness for the labour markets that they are likely to encounter. It also compares the distribution of the fields of study by the graduates of HEIs that shows a very marked divergence between Kazakhstan and comparator countries. In particular, it notes that the continuing high enrolment in business and law and low enrolment in science and technology cannot be expected to meet the needs of the innovation technology-based economy that Kazakhstan hopes to become while demand for so many law and business graduates can hardly be expected to continue indefinitely.

Government measures to improve the responsiveness of education and training: Several initiatives to strengthen the connection between higher education and the labour market are proposed in order to depart from previous modes of identifying labour market needs by state orders. When fully implemented, the National Qualifications Framework will enable and facilitate employer recognition of educational qualifications at all levels of the system. A separate Roadmap Report deals with the reform to date of the TVE system, including the occupational structure of the Kazakh labour market.

Issues: Measures are needed to: i) increase the proportion of graduates in science and technology; ii) focus on strong technician-level tertiary education systems at the level of ISCED 5B (Tertiary B); iii) strengthen information about career opportunities and the labour market and iv) improve the relevance of programmes for the labour for R&D. Moreover, the lack of pathways through the education system (mentioned under priority one) may discourage lifelong learning.

Priority Three: To build capacity for internationally recognised research and to integrate education, innovation and research in HEIs.

Building capacity for research in HEIs: Since the 2001 Law on Science was established, Kazakhstan has increased funding for HEIs to engage in scientific research. Currently there are several initiatives underway to build capacity in order to compete globally in research and innovation and to integrate education, innovation and research in HEIs. The primary strategies include: i) increasing funding for, and the capacity of, research universities to compete globally, while beginning to differentiate the missions of other institutions to focus on national, regional and local research or educational needs; ii) reorienting the "Bolashak" Scholarship Programme toward graduate education (Master's and doctoral candidates) to study in international universities; and iii) developing Nazarbayev University (NU) as a national model for the development of research capacity. In addition, Kazakhstan has taken a number of important steps to strengthen the capacity for research and innovation in HEIs, through the planned establishment of one or two research and ten "innovation" universities and through the development of a system for training qualified staff. In 2011, there were 1 337 Ph.D. students enroled in Kazakh universities, the majority in social sciences, education, economics and business and engineering and technology, with relatively few in agricultural science and veterinary medicine.

Funding Research: Government expenditure on research and development (R&D) increased by 4% from 2007 to 2011, (although it declined 2010-2011). The government has also shifted more of this expenditure to HEIs: between 2007 and 2011 R&D spending at HEIs increased by 70% or USD 19 million, with declining R&D expenditures for other institutions. Total research expenditures in Kazakhstan (HEIs and research institutes) are approximately .038% of GDP, with a goal to increase research spending to 1% by 2015. Capital expenditures for R&D have been expanding rapidly, growing more than 300% in the last five years. It is unknown how much of this is for development of new facilities or renovation and improvements in existing facilities.

Issues: In spite of the progress noted above, a potential barrier to the national goals for integrating research, innovation and education is the continuing bifurcation of the research enterprise between HEIs and research institutes. While additional funding in 2012/13 flowed to HEIs, a larger proportion of the research budgets remain in the research institutes, sponsored by non-education ministries. Limited resources result in research funds spread across many organisations, thereby potentially compromising the quality of research overall.

Even with the increased investment, Kazakhstan spends much less than its international competitors on R&D at HEIs as a percent of GDP. Kazakhstan also continues to have a far higher percentage of applied research and lower percentage in R&D, compared to international norms

Other barriers to progress are: i) heavy teaching workloads of academic staff that can limit time for research; ii) inadequate integration of education, research and industry (role of research universities, innovation clusters); iii) lack of a commercialisation infrastructure for researchers (institutions, training innovation managers, cultivating entrepreneurship culture); iv) need to continue to train, attract, and retain best research minds in Kazakh HEIs; v) low level of private demand for R&D in the country; and vi) lack of an effective national innovation system (better coordination among the government agencies responsible for funding research and innovation in the country).

Priority Four: To build institutional capacity for a diverse, globally competitive higher education system.

It is widely accepted that higher education systems require a range of institutions with differentiated educational missions in terms of student selection, types of programmes offered and degrees awarded; types of research and extent of regional and community engagement. Their financing needs to reinforce mission differentiation: to maintain a balance between the need for a limited number of globally competitive research universities granting degrees at the post-graduate level of research-intensive doctorates; and the need for institutions focused primarily on teaching at the undergraduate level.

Progress to date: Through the new classification of institutions, Kazakhstan is promoting the differentiation of institutions according to the scope and types of academic programmes and the level of research. Data from 2011 indicates that of the 149 higher education institutions in that year there were 90 universities, 26 academies and 33 institutes. The clearest element of national strategy is to develop world-class research universities on the model of Nazarbayev University. One issue that Kazakhstan must address is the amount of both financial and human resources it can afford to invest in such globally competitive universities.

Issue: It is unclear whether Kazakhstan has an adequate strategy to develop the network of institutions with diverse missions, each performing at the highest international standards of quality and performance appropriate for its mission required to achieve the President's 2050 vision.

Priority Five: To establish a financing framework for a competitive, sustainable higher education system.

Mobilisation of public resources: Kazakhstan spends considerably less of its GDP on tertiary education than most other countries, including those with a similar GDP per capita. Several indicators, such as salary levels for faculty that are so low as to invite corruption and consistent feedback from employers that students are graduating from college ill-prepared for the working world, suggest that the level of funding is insufficient to produce the current level of degree outputs at a high level of quality.

Resource allocation: Kazakhstan's approach to funding institutional capacity building and applied research on high priority issues differs substantially from its approach to funding the education of its citizens. For teaching and learning, with very few exceptions (Nazarbayev University being the principal one), Kazakhstan does not utilise its resources to create capacity and does not make a conscious effort to create and sustain types of institutions that are appropriate for diverse needs.

Post-independence sector growth was funded primarily through student fees. The share of private financing is one of the highest in the world. Most public funds devoted to higher education are allocated through the provision of merit-based state grants (essentially a voucher) to students who obtain the highest scores on the UNT. Approximately a quarter of enroled students receive state grants. Although a small proportion of these grants are allocated to some disadvantaged groups such as orphans, the disabled and students from rural areas, the system is highly unequal, since an allocation based solely on pure academic merit tends to favour richer families who do better on the UNT as they are likely to attend better schools and can afford private tuitions. Once in receipt of a grant, the student has complete freedom to enrol in any institution of his/her choice. From 2015 only accredited institutions will be acceptable which provides a major incentive for institutions to participate in the accreditation process. A certain number of grants are restricted to disciplines specified as being of state interest. Similarly, students who receive the grants overwhelmingly choose state-owned institutions, increasing the inequalities of higher education expenditure.

Current government response: Recent development plans increasingly recognise that reliance primarily on private institutions and free student choice may be incompatible with other national goals. The systematic reduction in the number of HEIs, and the creation and funding of Nazarbayev University with a new model of both governance and finance, are important steps. Nothing comparable has yet been worked out for financing the rest of the higher education system on a sustainable basis.

Kazakhstan has also taken modest steps to address the problem of affordability for the majority of students who do not receive state grants. The country has established the National Education Storage System (NESS) and a student loan programme. While these two programmes provide ways to help families with the terms of payment for college, they do nothing to reduce the overall cost of attendance.

Issues: With the current level of state funding and the allocation mechanisms discussed, Kazakhstan cannot expect to educate enough of its population to high standards or conduct enough research to yield the needed levels of innovation. The report notes the inconsistencies between the government's approach to funding research versus undergraduate education and between national goals and the way in which funds are allocated to pursue these goals.

Priority Six: To establish a leadership and governance framework at both the institutional and national levels for a competitive system

International experience shows that for universities to respond to multiple demands, it is important that they have autonomy in their decisions about academic course content, staff appointments and institutional financing. At the same time, such academic freedom must be balanced with the need to be accountable to taxpayers. Increasingly, these responsibilities require the redefinition of the roles and responsibilities of different levels of the higher education system both at ministerial level and at institutional-level governing boards. Modern HEIs require fundamental changes in the qualifications of institutional leaders: rectors, presidents, and senior institutional administrators

Progress to date: Kazakhstan has taken important steps both to increase institutional autonomy as well as to reform the role of the Ministry of Education and Science (MES) of the Republic of Kazakhstan and national-level entities. Nazarbayev University will serve as one model of a new kind of corporate governance. Supervisory boards have been established for four national universities. Increased autonomy for institutions will be granted to HEIs accredited through the new independent process. The MES is redefining its role in support of a more decentralised, autonomous network of institutions while at the same time maintaining essential national-level regulatory controls. The establishment of new independent entities to carry out critical functions previously undertaken by the MES illustrates this intent (e.g. the Bologna Process and Academic Mobility Center and the new independent national Center for statistics and analysis, the National Center for Education Statistics and Assessment (NCESA).

Institutional level issues: While the principle is being widely discussed, there continue to be legal constraints on autonomy of public universities in Kazakhstan, which do not apply to private HEIs or to NU. There are regulatory constraints related to the capacity of institutions to assume increased responsibility for curriculum and academic programme development. Rigid budgetary controls based on historic practices limit the flexibility of university managers. The capacity to implement a new governance model for all public institutions is required which will focus on the need to earn greater autonomy and public trust through improved accountability for the expenditure of public funds and the guarantee of excellent education outcomes.

National level issues: While institutional autonomy is important, so is national-level capacity for providing leadership and oversight for the tertiary sector as a whole, utilising the key policy tools of policy leadership, finance, regulation, and accountability. In this respect, it will be necessary to clarify the role and responsibilities of the MES in steering the higher education system and in implementing policy reform; and to create a platform to enable policy makers, central administrators and funding agencies at national level to develop strategies and implement system reform.

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CHAPTER 1

Pre-school and secondary education

This chapter presents an overview of the pre-school and secondary education in Kazakhstan. It examines actions underway and on the horizon as well as new visions of pre-school education, the professional community of the pre-school organization and matters that need to be addressed.

Introduction

Objectives

Education, which constitutes a major investment in human capital, is a key driver of economic growth. In an integrated dynamic global market place, education systems must continually improve and work to adapt to changing circumstances. The SPED in the Republic of Kazakhstan for 2011-2020 is the foundation document driving education reform in the country. Although the Programme states that "in 2015, the transition period will be completed, and the education system of the Republic of Kazakhstan will correspond to the models of developed countries in its structure, content, management and financing mechanisms", no clear vision has been established for the second stage of this development in 2015-2020.

This chapter provides an analysis of the problems that the Kazakhstan system of education needs to address in the next stage of its development and is offered as a step towards this goal.

The Context

It has been recognised in Kazakhstan that progress needs to be made in the next decades both in terms of quality and the nature of the education provided. Ratings in international comparative studies such as PISA have been unsatisfactory. Approximately 14% of the populations of 2 483 473 is between the ages of 6 and 17 and public expenditure on education is increasing. In 2011, public expenditure on education accounted for 3.9% of GDP, which is below the OECD average of 6-7%.

Preschool education

There has been a move to increase the number of pre-school establishments. There are 8 392 pre-schools, including 2 970 kindergartens and 5 422 mini-centers in Kazakhstan, which provide pre-school education for 361 801 children. Since 2005 the total number of pre-school providers has increased more than five-fold, and the proportion of children aged one to six attending some form of pre-school has risen from 23.2% in 2005 to 47.2% in 2012 (ASRK, 2013a). In spite of this, there is a large difference between rural (21.6%) and urban (57.2%) enrolment. In urban areas every third child attends pre-school, while in rural areas only 5% are enrolled in pre-school.

While the target of universal coverage is important, ensuring the quality of pre-school education is just as important. The teacher-child ratio in pre-schools was 1:23 in 2012, which is higher than in the average 1:14 in OECD countries. In Kazakhstan pre-school teachers are recruited from technical, vocational and secondary education settings, while in top-performing education systems pre-school teachers have higher levels of qualifications. Hence, only 57% of pre-school teachers in Kazakhstan have attended HEIs. The average pre-school teacher's salary was KZT 49 600 in 2012, which is below the average salary in Kazakhstan of KZT 110 000. Expenditure on pre-school education is 0.1% of GDP, which is lower than the OECD average of 1-2%.

Secondary schools

There are 7 384 comprehensive schools in Kazakhstan, 55.8% of which are small multi grade schools. There are a total of 2 483 473 children and 292 064 teachers. Approximately 80.2% of the teachers are female. Average class size is 16 students, which is below the OECD average of 24. There are still 189 schools that, due to their age and lack of maintenance, are in very poor condition and 92 schools operate in three shifts. Internet access is available in 99.3% of the schools. There are 11.2 children per one computer and 527 schools are connected to the E-learning system. Around 34.2% of comprehensive schools have created a board of trustees.

Teachers and teacher education

There are some significant challenges in assessing and planning for teacher supply. There is an excess of teachers as there is no clear mechanism to identify the real demand for teachers. Only 65% of all teacher graduates found employment in 2012. Without a way to track how many of these graduates were actually employed as teachers, the majority may have found jobs in other industries.

The average teacher salary is KZT 80,386, which is lower than the average Kazakhstan salary of KZT 110 000. The starting teacher salary is KZT 42 000, which is only 30% of GDP per capita, while in OECD countries the starting teacher salary is 95% of GDP per capita.

As a result, the teaching profession is seen as low level and unattractive to high quality graduates. Also contributing to the problem is the low standard of admissions to pedagogical universities, where students who have an average UNT score of 70 are accepted. Annually 73,000 teachers upgrade their qualifications through the National Center for Professional Development "ORLEU."

All schools are expected to teach the Kazakh, Russian and English. There are 31 schools for gifted and talented children participating in a trilingual education project. This number is expected to increase to 700 by 2020. There are also 154 language centers throughout the country that provide English, Kazakh and Russian courses, as well as KAZTEST examinations.

Pre-school education

National priorities and international evidence

The *2050 Kazakhstan Strategy* set out ambitious goals to expand early childhood education, specifying that by 2020 all children aged three to six will have access to pre-school organisations; in March 2013 the MES announced that this objective could possibly be reached by 2017. This target is in line with other developed countries, where 90 to 100% have access. The President's address of 2012 endorsed this priority, emphasising the rights of children, which must be protected. Kazakhstan is not alone in focusing on children's rights to early education. A 1999 OECD Report on Early Childhood Education and Care contends that "the merit of any nation may be judged by how it treats its children." (OECD, 1999)

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Achievements to date are impressive. Since 2005 the total number of pre-school organisations has increased more than five-fold, and the proportion of children aged one to six attending some form of pre-school has risen from 23.2% in 2005 to 41.6% in 2010 (NCESA, 2011, p.23), and 47.2% in 2012 (ASRK, 2013a). See Appendix A for further details and how differences in coverage relate to different age groups.

Currently the expansion programme covers several different types of pre-school organisations [PSO] based on children's age: nurseries for children from birth to three years old; kindergarten for children aged three to six; mini-centers of various kinds for children aged one to six. Children aged five and six attend pre-schools that may be located in kindergartens, mini-centers and primary school settings. Different types of PSOs also serve different purposes (general/correctional/combined).

While the objective of universal coverage for three to six year olds is essential, it is just as important to ensure *quantity* along with *quality.* A recent development, important in terms of quality assurance, is the publication of new State Educational Standards for pre-school education and training that will come into effect in September 2013 (MES, 2013). This document will be a useful starting point for the future practice development work discussed below.

MATTERS THAT NEED TO BE ADDRESSED

Although there has been an impressive increase in provision, it is unevenly distributed across urban and rural areas: of all children aged one to six attending PSOs, 57.25% are from urban areas and 42.7% from rural areas (ASRK, 2013a).

There are other troubling issues, many of them openly acknowledged in public documents, including the poor quality of teacher training, the lack of high quality teaching staff[3], low recruitment rates in pre-school training programmes in pedagogical institutes, the slow development of inclusive education in the early years (less than a third of young children with disabilities have access to pre-school education) (MES, 2010a). The high demand for an insufficient number of pre-school places has created corrupt practices in the registration of children. The average bribe for child placement is KZT 33 550 (Total Kz, 2013).

There is great concern regarding the increase in private kindergartens being set up without the formal licensing process, and with relaxed inspection procedures. There also appears to be some doubt regarding the feasibility of the planned trilingual programme. Existing staff are unsure of how to proceed. In addition, new staff needs to be recruited. Both existing and new staff require training and support to implement the trilingual programme. Training and mentoring programmes do not seem to be in place.

Moving on

All of these issues need to be kept in mind as work continues to meet the government's ambitious goals. It has already been noted that increasing quantity does not automatically deliver quality. Furthermore, pressure to provide more places and organisations on a demanding time schedule may be equally problematic: the rate of change can be detrimental to establishing new high quality provision.

The new State Educational Standards for pre-school education and training, mentioned above, may play a significant part in understanding and resolving some of these issues. In particular, the document's emphasis on children's competencies opens up the possibility of seeing children's learning in the pre-school years from a holistic, humanitarian perspective, not simply in terms of measurable achievements. An interesting parallel can be found in the highly influential New Zealand Early Childhood Curriculum framework (NZME, 1996). This is a bilingual document based on four

3 There has been a significant increase in the level of training of teaching staff: the proportion of educators with higher education was 42% in 2005, rising to 55.4% in 2010, and 57% in 2012, although there is considerable scope for further improvement.

nationally agreed underpinning principles and five broad strands of curriculum experience but does not prescribe standards or levels to be reached at particular ages.

The different types of pre-school organisations, noted above, also present a challenge to the quality assurance process, given the differences that exist in funding, resources, personnel, child/adult ratios, inspection and monitoring procedures. Yet, if emphasising quality can be maintained across the whole spectrum of provision, this planned diversity could become a strength. The New Zealand experience is again relevant here, as their curriculum framework was also written to be used in a number of different kinds of provision, and to respect and support the distinctive characteristics of each.[4]

It is clear that this overall focus on quality can only be maintained if all stakeholders are clear about the underlying purpose of the pre-school sector as a whole, in terms of children's growth and development. If, however, as the 2012 World Bank Report suggests, expansion of child-care facilities is principally driven by the need to increase female labour force participation, it is likely to be very difficult to ensure that every kind of institution provides a full and enriching educational experience.

Although the next phases of widespread reform will undoubtedly be challenging, these very challenges can be seen as an exceptional opportunity for a thorough review of the best way forward. Four areas of practice development stand out as in need of systematic reappraisal and reformulation within the overall drive for excellence. These four areas of future development have profound implications for training opportunities, both initial training and continuing professional development for educators working in all forms of early education. Each of the areas is introduced briefly below.

A new vision for pre-school education

There is a need for open and informed debate leading to a clarification and reformulation of the overall purpose of pre-school provision as a stage of the education process, not simply as preparation for formal schooling after the age of six. International best practice shows that it is no longer appropriate to construe the early years of education in terms of what has been called the "factory model", in which raw materials (young children between the ages of one and six) are transformed into pre-specified products (school-age children), meeting the required standards as the result of prescribed processes (standards and indicators issued by central government). There is a growing understanding in countries renowned for the quality of their services for young children that these provisions should not be thought of in terms of desirable outcomes that can be set out in advance and measured at the end of the programme, but in terms of shaping and providing places in which children can live their childhoods. A pre-school system can most effectively be evaluated by asking the question "Are these places where children can live a good childhood?" For pre-school organisations in Kazakhstan, a second question could be formulated thus: "Are these places where children can experience what it is to live and learn in a harmonious, inclusive, equitable community, respectful of its cultural and ethnic diversity?"

Significant in this part of the process of the reappraisal and reaffirmation of the overall mission of the reforms is the willingness of the government to learn from international experience. Indeed, international developments in early education have been greatly fostered by widespread exchange and dialogue around the world. Key players in these dialogues include early years specialists from New Zealand, Sweden and other Nordic countries, the UK, and the city of Reggio Emilia, Italy. [Some background information about the "Reggio approach" is given in Appendix B.

4 The six kinds of provision are: i) kindergarten; ii) play center; iii) child-care center; iv) family (home-based) day care; v) Maori Language immersion schools and units; vi) Pacific islands early childhood center.

A new vision of the child

Over the last decades, in many countries, there has been a profound shift in how early years educators conceptualise the children with whom they work. There is a determined move away from the image of the child as a blank slate or empty vessel, who enters a pre-school setting in order to start learning about the world from his or her educators. Instead there is a growing emphasis on children as powerful learners from birth, who bring their considerable strengths to bear on all their experiences, in and out of school. This "active learner" is a child who learns spontaneously, driven by a thirst for understanding, eager to explore the world and everything in it. In this construction, children are seen as imaginative, inventive and creative, in ways of their own invention; they are passionate learners, motivated by the desire to make meaning of their experiences; they are sociable learners, strong in friendship, loving, compassionate, ready to give and to receive.

Powerful learners in the early years do so much more than acquire the necessary skills for the formal programme of the primary school. Above all, if they have encountered intellectually challenging and emotionally engaging opportunities for learning throughout these years, they will move into the primary school fired up with a love of learning, and a "mastery" mind-set: this is a disposition described by Dweck (Dweck, 1999) and her colleagues as the capacity to meet challenges with curiosity, perseverance and enjoyment.

A focus on learning

Alongside this growing understanding of the "powerful child" has come a renewed focus on *learning* (what children do best). Teachers consider with great care what shapes and fosters this learning, and how they can best cherish it and sustain it. In this construction, learning is happening at every moment of the day: children learn from everything, and everyone, including each other, not just through instruction and organised training activities. As the great John Dewey emphasised, throughout his work, while all education is through experience, not all experiences are equally educational; indeed some experiences are mis-educative (Dewey, 1963). Therefore educators in pre-school organisations must focus on whether the whole environment opens up opportunities for learning, or whether it sets limits on it, through, for example, poor resources, constraints of time or space, neglect of children's explorations, fascinations and interests. In this view, evidence of worthwhile learning is seen, not just in prescribed outcomes, but also more importantly in the growth of each child's powers to think, to feel, to do, to represent and express. The most significant qualities of young children's learning, from this perspective, are its purposefulness and unpredictability, its inventiveness and creativity – all expressions of children's passionate desire to understand. Learning is not seen as an end-point but as a continuing and self-motivating process.

The teacher in pre-school organisations

The substantial increase in the number of early years professionals needed to implement the desired expansion of provision is, once again, an opportunity to reconsider: what should the characteristics of these professionals be? Official documents comment on current problem areas, including the recruitment of well-qualified trainees, low salaries and lack of prestige, long working hours, overload and external pressures, the lack of appropriate continuing professional development. These problems must certainly be resolved. In addition, ways must be found of enabling early years teachers to be the agents of change in their organisations: this would entail their embracing the necessity to see themselves as *learners as well as teachers*, continuously learning about their practice, by, for example, asking challenging questions, looking for evidence, reviewing it critically, experimenting imaginatively, and evaluating the worthwhileness of the children's learning. Teachers too, in this

construction, can be powerful, active learners, not content with following prescribed technologies and techniques in the pursuit of targets and standards. They can be innovative and responsible in the on-going process of self-evaluation.

The professional community of the pre-school organisation

Many new kindergartens, mini-centers, nurseries and pre-schools have been opened in recent years and there are many more to come. There are reports that document the apparent low standards of some of these buildings, and the lack of suitable resources (for example: equipment, basic facilities, access for children/adults with disabilities, opportunities for outdoor learning). These problems must be resolved in the next stage of implementation. In addition, there should also be consideration of what sort of school buildings are appropriate for the children and families who will be using them in 2020 and beyond. In many countries, pre-school buildings are no longer exclusively dedicated to education, but have developed as integrated multi-service centers for young children and their families, incorporating health services, speech therapy, social care, and adult learning opportunities. This is a possibility to be carefully considered in the shaping of the new forms of pre-school organisations.

Another important aspect of development for the new wave of pre-school organisations is the creation of an expectation that every school should be a *developing, learning school,* with a school-wide multi-professional learning community at its heart, working not in isolation but connected by regional networks of schools, university departments, local authority advisers and so on. The curriculum, pedagogy and assessment practices of these schools should be co-ordinated with – though not dictated by – the practices in the first year of the new 12 grade schools: this will necessitate much closer links between pre-schools and the primary/secondary schools to which their children transfer.

National standards, curriculum, assessment, textbooks and pedagogy in secondary schools

National priorities and international evidence

At the broader socio-economic level these include:

- Developing the kind of workforce required by an increasingly advanced economy and polity: one with high level innovative skills, with technical skills and one capable of offering leadership in the country, the region and in engagement with the international community;
- Developing a community that is living in harmony, proud of its own national identity, respectful of it ethnic, linguistic and cultural diversity, an inclusive and equitable society in which individual enterprise is matched by care and support for all.

The main threads of educational policy reflect these wider social goals. They include (our attempted summary of a number of different sources[5]):

5 Sources: State Programme of Education Development 2011-2020, Address by the President N. Nazarbayev on Strategy "Kazakhstan -2050. New Political Course of the Established State" dated December 14, 2012. Annual Address of the President N. Nazarbayev to the Nation dated January 27, 2012, Speech by the Minister of Education and Science at Collegium of the MES. Astana, January 31, 2013, National Reports on Education Development 2010, 2011, 2012, National Strategic Plan 2020.

- raising the overall level of achievement of the school population (a goal that might be reflected e.g. in international comparisons such as that offered by PISA);[6]
- developing skills (e.g. in terms of the application of knowledge, creativity and critical thinking, inquiry and analysis) that are required for innovation and leadership;
- reaffirming and realising in the school context national identity expressed through e.g. competence in both Kazakh and Russian, through engagement in traditional cultural activities and familiarisation with Kazakhstan's own cultural and intellectual heritage and through the cultivation of traditional values of care, respect and hospitality. This is the territory often assigned in schools to the domain of "upbringing" though it is also extensively expressed through all areas of the curriculum;
- engaging with wider international experience (and building competence in such engagement) through the development of high levels of competence in English as well as Kazakh and Russian (the trilingual policy), through learning from international experience and through access to the wealth of resources available on the Internet.

Provisionally, at least, these educational values and goals provide a basis for our analysis of the issues that need to be addressed in the current system.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

These include:

- the extension of the period of schooling to 12 years - partially by 2015 and to the whole system by 2019;
- the introduction of revised State Compulsory Educational Standards;
- the introduction of new textbooks;
- the introduction of a new Unified National Test (and University Entrance Examination);
- an extensive programme of in-service training of teachers (through the Centers of Excellence programme) focused on new pedagogic requirements;
- a programme of experimental schools exploring the possibilities of E-Learning;
- the roll out of a new curriculum and assessment system from the Intellectual Schools to mainstream schools;
- the introduction, first in experimental schools and then in the mainstream, of trilingual education.

All of this indicates a will to reform education in Kazakhstan, and many people at all levels in the system are working hard to this end. However, in our view, the current plans are poorly co-ordinated, insufficiently ambitious and lacking in an understanding of the educational principles and practices that need to be applied if Kazakhstan is to move forward nationally and on the international stage in the way in which it seeks.

6 The World Bank analysis of PISA results concludes that: "With PISA scores around 400 [Kazakhstan's] performance falls 100 points below the OECD average. Furthermore […] Kazakhstan falls below its expectations given its level of GDP per capita. The average PISA scores in 2009 were about 398 – 32 points below average."

MATTERS THAT NEED TO BE ADDRESSED

The need for a co-ordinated approach

Curriculum, assessment, textbooks and pedagogy (and by extension, teacher training and school leadership, which are discussed in other sections below) all have to be developed together and to be informed by the same goals and values, or they will undermine each other.[7] To give a concrete illustration of the sort of problem that arises, one school we visited was responding to the requirement to teach science and maths through the medium of English. However, at the time of our visit the school reported that English medium textbooks in physics were not yet available; the UNT questions on science were still posed in Kazakh or Russian using technical terms with which the English medium students were not familiar; and there was no teacher qualified at a sufficiently high level in both English language and mathematics to do the English medium instruction. In spite of these problems the school showed remarkable resilience in improvising solutions, and no doubt these problems will be addressed over time, but neither the school nor the students would have had to face these frustrations and difficulties if the logistics of introducing this change had been thought through and managed in a systematic way.

Two solid principles of curriculum development, in particular, are worth remembering: i) as it is often expressed, "there is no curriculum development without teacher development" (a point on which we shall expand in the section below on teacher education) and ii) that high stakes assessment is the most powerful determinant of the priorities of pupils, teachers and their parents, so if the examinations do not properly reflect key educational values and principles, then most of our other efforts will be in vain. This concern underpins our criticism of the current UNT later in this section.

National standards

A central concern for this chapter is the failure of the standards, curriculum, textbooks, and, critically, the UNT to focus on what students should be able to do beyond recalling large quantities of factual information. Mathematics is something of an exception here because it requires students to engage in problem solving operations. In particular, we found few references in documents or, indeed, in conversations with colleagues in the educational community regarding the sort of intellectual capacities that they wish students to develop. There was some talk of "skills", some "competences." We suggest that such capacities, applied across the curriculum in different ways are essential both to achieving higher standards of education, including those measured by PISA, to innovation and effective participation in, as well as leadership of, all spheres of life. Such capacities might include, for example, the ability:

- to *compare and contrast* e.g. two or more poems, landscapes, historical rulers, ecologies, chemical reactions;
- to *explain why* something happened (e.g.in history), why it happens (e.g. in plant biology), how it works (e.g. in an electrical circuit);
- to *interpret* (i.e. to explain what it means or what is its significance) e.g. a graph, a set of statistics, a photograph;

7 In identifying, briefly, these interdependent elements of an educational system we have also indicated what international evidence (Darling-Hammond, 2010; Hattie, 2012; Levin, 2008; Mourshed et al. 2010; Stobart, 2008) suggests are key levers for change, the most powerful perhaps being (high-stakes) assessment; teacher education and leadership at both the school level and in the wider administrative and support structure.

- to *evaluate* e.g. a newspaper report or a personal diary as historical evidence, the claims of a plant fertiliser, or the quality of a musical performance;
- to *"discuss"*, i.e. to present and weigh different points of view (on the causes of the First World War, on the pros and cons of urbanisation, on different interpretations of a piece of literature);
- to *investigate* e.g. a mathematical puzzle, the life cycle of a silkworm, the mineral content in a rock or local people's memories of the programme to develop the virgin lands (the important period in the history);
- to *develop a coherent and consecutive argument* – as mathematical proof, in support of a particular scientific hypothesis, in support of a particular account of historical events, in support of a particular reading of landscape formation.

Certain of these abilities are present in some of the contemporary discourse in Kazakhstan around "critical thinking skills" and "functional literacy", but in our view if the abilities that are indicated above are as important as we think they are, they need more careful teasing out, clearer reflection in national standards, the curriculum and textbooks, and above all very clearly present in the end of school and university entrance assessment systems.

The closest that the 2009 standards[8] got to these sort of competences was in paragraph 5.6 of the standards document: "competencies include: information competence; communicative competence; the competence of solving problems." Even such references that the standards make to other capacities tend, however, to get reduced to "information competence" and more mechanical learning of information when the standards get translated into curriculum, textbooks and, especially, assessment.

The revised standards effective as of September 2013 make little progress towards defining the sort of intellectual capacities that should develop. Paragraph 2.8 indicates that "primary education provides the formation of the moral qualities of the child, his emotional and normative relationship with the world, positive motivation towards learning [and] the development of his individual abilities and skills in cognitive activity" – but it does not explain what these "skills in cognitive activity" are. Later in section on secondary education, there is, however, reference to "the ability to analyse, process, synthesise and use" information but this is applied only to "scientific information."

We suggest that the current standards might benefit from wider debate and consultation with leading schools in Kazakhstan and perhaps more extensive reference to the standards employed in high performing educational systems internationally.

The curriculum and school textbooks

Given the way in which standards have been defined, it is perhaps not surprising that the curriculum in mainstream schools consists, for the most part, of information to be memorised and reproduced, and this is reflected in school textbooks (and, crucially, in the UNT – see below). "While students performed very well on an international mathematics and science test, (TIMMS), their practical skills are not well developed as the curriculum center on raw memorisation" (ICG, 2011, p. 32)

8 These standards were not formally approved by the MES but were posted for discussion to use as a base for grades 11-12 education in Kazakhstan.

If we press further into the higher level statements about standards to the specification of learning content, there are some encouraging signs. The programme on the History of Kazakhstan (NAE, 2010)[9], for example, includes references to objectives such as:

- "develop students' ability to use this knowledge in life, self-compile, analyse cause-effect relationships, build personal relation to a particular historical phenomenon;
- "generate in students the skills of creative application of historical knowledge, ability to work with historical sources to interpret historical events and phenomena on the basis of a comparative analysis."

The programme also includes an endless list of factual knowledge,[10] and it appears, it is this that counts, because when it comes to the UNT these are the sorts of questions that are asked:

Question 20: West Kazakhstan was named during the Iron Age:
A) Petrovka
B) Malo-Krasnoyarsk
C) Alekseevka
D) Shagaly
E) Stepnyak

Question 21: Name the Middle Age city where Christian, Muslim, Buddhist cemeteries were found:
A) Shelek
B) Taraz
C) Sauran
D) Sumbe
E) Syganak

Question 22: Years when Genghis Khan conquered "Tangut" state:
A) 1220-1221
B) 1211-1218
C) 1218-1221
D) 1207-1209
E) 1218-1224

Any signs of creative application, analysis, comparison, or interpretation have disappeared by this point under a welter of factual information.

The addition of a 12th year of schooling could have been an opportunity to introduce a more intellectually engaging and demanding curriculum. The 2010 "Concept Paper" on the introduction of 12-year schooling (MES, 2010b)[11] contained some promising ideas. Its rationale explicitly sets out its aim to "overcome traditional reproductive learning style and the transition to a new developmental, structural model of education providing cognitive activity and independence of thought." The paper makes reference to the development of a competence-based approach to the design of the curriculum and in a section on "The objectives of teaching" emphasises the "design of the educational process

9 Appendix C offers a comparison of the objectives for teaching the history of Kazakhstan with those for the NIS History curriculum and Cambridge IGCSE History. As we indicate here, however, the assessment criteria are probably more powerful than such statements of intent in driving the actual learning behaviour of students.

10 The 2010 Concept Paper on 12-year Schooling is one among many reports on education in Kazakhstan that criticises the sheer "information overload" that the current curriculum provides.

11 Though the concept was developed in 2010, the legal basis for the introduction of 12 years of schooling still rests on Government Resolution N681 *On approval of the Action Plan for the transition to 12 year secondary education* dated 19 July 2006.

with a focus on problem solving;" although it fails to adopt a competence-based approach when it starts to describe what the curriculum should contain. Indeed there is more detail about the moral and social values that should be promoted than the cognitive abilities illustrated above. The indications so far, and the opinion of teachers with whom we spoke in experimental schools that are already introducing 12-year education, is that it has been used simply to pack more and rather technical information into the programme. Teachers were very critical of the latest textbooks designed to support the 12-year curriculum, some of which they say are unintelligible to students.

Schools in Kazakhstan now find themselves in the process of two parallel and significantly different types of curriculum development, each of which is developing its own set of textbooks.[12]

First, in the mainstream schools, 12-year schooling has been introduced. Students in the experimental schools that are piloting this change are currently in grade 11 and will take the first exams under the new structure in June 2015. The rest of the system will follow close behind, probably with some phasing in, with the first larger scale cohort of pupils in the 12-year curriculum entering grade 7 in September 2015 and taking the new exams in June 2021. In the meantime, those entering grade 7 in September 2014 will continue to follow a specially designed 11-year programme up until their final examination in June 2019. This change will involve a significant re-structuring of the school system. In Astana, for example, 43 out of 70 schools will teach only up to grade 10, while Gymnasia, Lycea and the best prepared comprehensives will offer the 12-year curriculum. The City Education Office is building 10 new "Profile Schools" to provide for the remainder of students one of two routes through the final two years of schooling - either through science or the humanities. This kind of re-structuring of schooling so as to provide specialist two-year carries significant budgetary implications.

In the meantime, however, mainstream comprehensive schools will also be introducing the Intellectual Schools curriculum, the first four years of which will, based on current indications, be almost unmodified from that currently being piloted in the Intellectual Schools. It is expected that a modified version of the Intellectual Schools curriculum, which pays more attention to the sort of intellectual skills indicated above, will progressively be rolled out across the whole system.

It is clear to us that the rolling out of the Intellectual Schools' curriculum and assessment to the whole state sector in the coming years will require major investment in: in-service and pre-service teacher training; training of principals, vice-principals and other leaders in schools; training of local and national government officials; the kind of learning resources including classroom equipment, science and arts facilities and equipment etc. required by the new curriculum; and in the development of new forms of both formative and final assessment.

12 The situation with textbooks illustrates the confusion. On April 18, 2013 at the second meeting of the Supreme Board of Trustees, "Nazarbayev University", "Nazarbayev Intellectual Schools" and "Nazarbayev Fund", the Head of state instructed the Intellectual Schools to take the lead in combating substandard textbooks. We know that we have problems with the quality of textbooks," said the President, "so I assign the [Intellectual] Schools to take the lead in tackling the problem. It is necessary to organise the development of textbooks, instructional materials, digital educational resources, ensuring the implementation of an integrated programme of education, Downloaded 22 July 2013 from *http://www.uchi.kz/prezident-poruchil-intellektualnym-shkolam-vozglavit-borbu-s-nekachestvennymi-uchebnikami* But the MES continues to work on its own textbook reform programme, which is currently aligned to a different curriculum than that offered by the Intellectual Schools.

Assessment: the Unified National Test (UNT)

The UNT is, in our view, one of the most powerful as well as one of the most dysfunctional elements of the educational system in Kazakhstan. It is powerful because it plays a key role in determining students' future notably their access to higher education; teachers' and schools' performances are assessed by reference to their students' performance on UNT scores; and parents, teachers and students are all almost single-mindedly focused on their results.

The UNT is dysfunctional from several points of view. More detailed analysis is needed than we have gone into here. Firstly, almost all of the UNT tests are based on the recall of various factual information. This is of course consistent with the way the national standards are expressed (see comments above), and it reinforces expectations of low-level intellectual competence. A few examples of UNT test questions set alongside questions from international examinations will perhaps serve to illustrate the low level of intellectual demands that characterises the UNT.

In Geography, the UNT asks elementary factual questions and provides a choice of answers, such as:

Norway is located in:
A) Southern Europe
B) Central Europe
C) Western Europe
D) Eastern Europe
E) Northern Europe

An International General Certificate of Secondary Education (IGCSE) Examination applied in 120 countries through Cambridge International Examinations to students in grade 10 provides a previously unseen graph showing population density and fuel consumption per head of population in cities in North and South America, Europe and Asia. It then asks a series of questions requiring students to extract information from the graph, make comparisons between cities and then explain the differences (see Appendix C).

In History, the UNT asks of grade 11 students:

Growth of urban culture in medieval Kazakhstan is observed in:
A) VIII-Ix century
B) VI-xII century
C) VI-VII century
D) VI-VIII century
E) IX-XIII century

An IGCSE exam paper for grade 10 makes the following demands:

"Military strength was an important part of the creation of the German empire."
A) Describe how Roon and Molike reformed the Prussian armed forces.
B) Why did France declare war on Prussia in 1870?
C) How far was Prussia's success in the war of 1970 responsible for the unification of Germany? Explain your answer."

The more advanced "A"/"AS" Level history paper (taken at grades 11 and 12) provides six different documentary sources relating to the Triple Entente (between France, Russia and Britain) in the years before the World War I, and then sets the task "The Triple Entente was a serious threat to peace before World War I. Use sources A-E to show how far the evidence supports this statement."

A typical "A" level question in England and Wales (taken at grade 12) might ask:

"Why did Nicholas II's regime survive a revolution in 1905 but not in 1917?" and students would have approximately 45 minutes to construct a consecutive well-argued and evidenced essay style answer. ("A" level grades play an important part in university selection).

A UNT Biology test asks:

Process that occurs in the lungs:

A) Biosynthesis
B) The collapse
C) The water exchange
D) Photosynthesis
E) Gas Exchange.

An "A"/"AS" paper in the same field shows a picture of a scanning electron micrograph of part of the wall of the bronchus of a healthy human and asks the student: i) to name certain parts of the bronchus; ii) to state the names of the conditions that contribute to chronic obstructive pulmonary disease; iii) to describe a section through the wall of a human suffering from chronic bronchitis; and iv) to suggest why a person with chronic bronchitis is more likely than a healthy person to suffer from infectious diseases of the gas exchange system.

We have given some detailed examples here of which some are more fully illustrated in Appendix C to underscore i) the huge gap between the intellectual demands governing secondary education in an advanced educational system compared with those in Kazakhstan; and ii) to show how clearly the low level demands of secondary education in Kazakhstan are imbedded in the powerful instrument of the UNT.

Currently, the UNT also serves as the main determinant of those who proceed to higher education. Under plans for the 12-year schooling it is proposed that there will be two tests following completion of the 12th year: one providing as it were a statement of achievement at the point of leaving school; the second being a new university entrance examination. The UNT does not serve either function very usefully. As a university entrance examination it woefully fails to test the sort of abilities that universities seek to find and to develop in their students (unless the universities also work on the basis of a curriculum and assessment of recall). New higher education admission tests require radically different approaches from those thus far demonstrated in the UNT. As a school leaving exam it fails to provide the profile of students' achievement across the full range of school activity that does justice to students as all round individuals and provide potential employers with a holistic picture of the abilities that students might bring into the workplace. The Concept Paper on the 12-year curriculum identifies "the focus on obtaining formal results, rather than on the development of the individual" as one of the obstacles to educational development.

Another dysfunctionality of the UNT is that, as it appears, UNT results are to be used as a measure of teachers' performance and linked to performance-based pay. There is clearly something deeply unfair about judging teachers' success by reference to students' end of school scores and without taking into account their very different starting points e.g. between an urban gymnasium and small rural school, what is sometimes referred to as the "value added" measure. Also, the UNT assesses, as we have set out above, a very narrow range of the intellectual competences that we might regard as desirable. The school system, by contrast, is expressly committed to developing a wider range of qualities in young people – for example under what is recognised in Kazakhstan as "upbringing." None of these achievements are measured by the UNT, so it must be regarded as an invalid indicator of the success of either students or teachers.

Continuous assessment

The other area of assessment that seems seriously flawed is the practice of awarding marks on a 5-point scale, although usually only two or three points are used, at the end of every lesson. There are no clear criteria for the awarding of these marks, which are given on the basis of very little evidence. This system is a very poor substitute for, the approaches to "assessment for learning" currently being promoted under the Centers of Excellence programme. The assessment system needs to be changed radically.

Pedagogy

The requirements of the assessment system determine the forms of pedagogy employed in the classroom. During our limited observations in the classroom, but also recounted by teachers, this encourages styles of teaching and learning which is mostly passing on and rehearsing information which students are expected to learn and reproduce accurately in response to test questions. This "works" in so far as it requires recall, but it leaves students with very little capacity to apply knowledge, to examine material critically or any of the other intellectual competences we have referred to above. Therefore, it is not surprising that Kazakhstan's students can cope with the rather restricted demands of the lower levels of TIMSS, perform relatively poorly on PISA tests and when some more "logical" questions were added to the UNT, students struggled to answer and overall scores declined.

The Centers of Excellence programme is a key programme of in-service training in Kazakhstan. It continues to promote and equip teachers with more versatile pedagogies: additional active and interactive approaches to learning; more student centered learning that takes into account individual differences; critical thinking; the use of assessment to inform learning; the use of ICT; etc. This training anticipates and prepares teachers for changes in the curriculum which provide for more creativity, greater understanding, better capacity to apply knowledge to new contexts, project-based work etc. However, the work on pedagogy will be frustrated if curriculum and assessment are not aligned to offer the sort of intellectual challenges for which already some 10 000 teachers have been prepared. There is an urgent need for changes in the mainstream curriculum - reinforced by the design of textbooks - which reflect and call for the styles of learning for which teachers are now being prepared.

Internet access is generating considerable interest with regards to the possibilities it may offer as well as the learning resources that it might provide. An experimental programme focused on e-learning is being introduced into initially 800 schools, and according to the MES, "Experience has shown that e-learning improves performance by 15-20% due to the fact that the study material is presented in a more understandable interactive way." Our limited evidence suggests, however, that few teachers have grasped the possibilities that web-based learning might offer. In our classroom observations teachers still tend to use e-learning resources as an extension of the textbook rather than as a much more diverse, interactive and challenging resource for learning.

In a country with such a widely dispersed population, we were quite surprised not to find any of the sophisticated approaches to distance education that have been developed at all levels in countries like Australia and Canada, with similarly widely scattered populations. Even countries like the UK, where the advantages of distance education approaches, and not just web-based systems, provide flexible learning opportunities for working people, those taking care of families or isolated from mainstream institutions by physical disability.

There is a great need to explore experiences outside of Kazakhstan of what E-Learning and Distance Learning approaches can offer, including the use of radio and television,[13] to enrich learning in small and less well staffed schools with a view to developing more sophisticated approaches and capacity in Kazakhstan.

Other concerns about pedagogy will be explored in the following sections on trilingual education and on teacher professional development. We should note too that any changes in pedagogy require support both from school leaders and from local government, and they need to be reinforced by criteria used in teacher assessment (e.g. for attestation) and for school inspection. All of these levers of change need to be applied for the same purpose.

Trilingual education

National priorities and international evidence

The 2050 Kazakhstan Strategy reinforces a previous policy decision that by 2025 Kazakh will be spoken by 95% of Kazakhstan's citizens. Moreover, it is expected that Kazakh will take on a "lead role in all spheres of life." This is considered to become "the most important achievement" of the state, "something that binds the nation and cements it" and central to the "state's sovereignty." In addition, a goal has been set for young people to learn "Russian and English equally well as Kazakh." The term "equally" implies very high levels of proficiency in these languages.

Education systems can support regions and/or countries in developing a trilingual citizenry, but this requires:

- a good understanding of trilingualism and trilingual education;
- government and public support;
- well-trained educators and school leaders capable of delivering high quality education in each of the three languages;
- thorough and well-co-ordinated planning and implementation of trilingual education as well as assessment and research thereof;
- sufficient time and money;
- the building of a societal context that incentivises the regular use of three languages (Aronin&Hufeise et al, 2009; Cenoz, 2013; García, 2009) .

Nonetheless, there are almost no examples of a nation as a whole seeking to achieve such a high degree of proficiency in three languages that are so distant from one another while also:

- seeking to renew the nation's entire curriculum and learning materials;
- adopting new teaching and learning practices that integrate best local and international practice;
- shifting from 11 years of schooling to 12;
- strengthening the position of the state language which has been disadvantaged for decades whilst also seeking to protect ethnic minority languages.

13 We are aware that a new educational TV Channel called Billim (Kaz 'Knowledge') was established in 2012 but its website is not functioning and we have been unable to evaluate the quality of its programmes.

Kazakhstan's vision of a trilingual society is ambitious, but achievable. It will require, however, a very well planned, properly resourced and highly co-ordinated approach that takes into account local needs and knowledge, and what has been learnt about trilingualism and trilingual education elsewhere.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Kazakhstan has actively supported the implementation of the trilingual policy through a series of strategic decisions articulated through legislation and planning documents, and through related actions. Legislative acts and key documents include the 2050 Kazakhstan Strategy; the Law on languages; the State programme for the development and the functioning of languages for 2011–2020; the state educational standards for pre-school, secondary, technical, vocational, post-secondary, higher and postgraduate education; and the concept of the development of foreign language education.

Currently, 200 pre-schools are piloting trilingual education. The government has established the Daryn Center, which as of 2007, is co-ordinating the work of 33 schools that are piloting trilingual education. By 2020, building on the experience of the 33 pilot schools, trilingual education is to be expanded to include 700 schools. The recently established Nazarbayev Intellectual Schools (NIS) are also piloting trilingual education in 13 (soon to be 20) schools and are working with 35 partner schools to share their experience. In 2011, the Tildaryn Center was established to foster the learning of the state language and to introduce effective and new methods for teaching Kazakh, English and other languages. Ablai Khan University and Karaganda University are taking a leadership role in preparing teachers for trilingual education.

A total of 130 centers (state and private) have been created where people can learn both Kazakh and English. A 30-volume specialised Kazakh-Russian and Russian-Kazakh dictionary is under development. A system has been created for assessing knowledge of the state language – the KAZTEST. Top grade civil servants are required by law to pass the advanced level of the KAZTEST. The President's scholarship programme "Bolashak", now supports teachers in going abroad for up to 18 months to improve their language skills and to undertake placements in foreign schools. In short, the Kazakh government has put in place ambitious plans, and backed these up with mechanisms, only some of which have been named here, to support their realisation.

MATTERS THAT NEED TO BE ADDRESSED

There is:

- a lack of agreement on what is meant by trilingualism and trilingual education; and
- little awareness of what results have been achieved by students in various types of trilingual education programmes elsewhere in the world.

During our meetings in Kazakhstan, we came across diverse understandings among officials of what the terms bilingual and trilingual mean and how trilingualism can be achieved. When asked about trilingualism, most people began to speak about the teaching and learning of English. There seems to be a widespread belief that current measures for the learning of Kazakh and Russian are sufficient for achieving widespread fluency in these languages. This is unlikely to be the case. Understanding by those we met of how to achieve high degrees of proficiency in three languages often ran counter to evidence from research in this domain. This means that people were also unaware of the wide variety of investments and practices required to achieve those results. This complicates the development of policy and standards, and planning for their implementation including the development of pre- and in-service training for teachers, school leaders, trainers, and government officials who need to lead

and manage trilingual education initiatives. Currently, planning is taking place with insufficient knowledge about trilingual education, insufficient stakeholder co-operation and partly based on some false assumptions. This is leading to some poor planning decisions.

The levels of fluency to be achieved are insufficiently and inconsistently defined. Fluency is the ability to speak and/or write a language with ease and accuracy. One government document speaks of all students achieving fluency in the state language. This is probably an unrealistic target, at least in the short-term. Moreover, without defining what is meant by fluency this target would be difficult to measure. By contrast, another document sets a target for all high school graduates to reach a B1 level *(Common European Framework of Reference for Languages* [CEFR]) in the state language. This target can be considered too modest if Kazakh is to take "a lead role in all spheres of life." Also, targets are not differentiated according to native speakers and those who are learning Kazakh as an additional language. Native speakers would be expected to achieve much higher degrees of fluency than non-native speakers. Moreover, the CEFR is not intended as a reference point for measuring fluency in a native or first language, and the CEFR descriptors of competences would need to be operationalised for trilingual education so that learning can be better planned and student achievement better measured. Although the CEFR offers a set of descriptors, it does not give precise indications of how these are to be measured.

The insufficiently and inconsistently defined levels of fluency to be achieved make it difficult to plan supportive measures such as curriculum renewal or learning resources development in a systematic manner.

Curriculum goals are not fully aligned with the trilingual goals, and assessment of language learning is not aligned with curriculum intentions. For example, the grade 11 curriculum intentions for Kazakh in Russian-medium schools are quite low in comparison to English.[14] Students are expected in English class to develop intercultural communication skills, write essays using a chosen style, and have in-depth interdisciplinary knowledge about the cultural heritage of the target culture. None of these requirements apply to Kazakh language classes. In addition, the UNT used for assessing the Kazakh language knowledge of students in Russian-medium schools, Russian language knowledge of students in Kazakh-medium schools, and the English language knowledge of students in both types of schools are not aligned with the curriculum intentions. The UNT tests above all knowledge of grammar, vocabulary and some facts related to the target culture.[15] It does not test the ability to write a coherent argument or a composition or to read and analyse complex texts. This may have a negative backlash effect with students putting little effort into the important skills of writing and reading.

There is an insufficient understanding of how to engineer language whilst fostering trilingualism. Language shift is defined by the decline in the status and use of a language (Fishman, 1991). There is a disjunction between the plan for Kazakh to take on a "lead role in all spheres of life" and the extent to which language shift is being researched at universities and monitored by government. Data about language learning and use as well as about obstacles to language learning and use are not widely available. For example, little data is available on out-of-school language use by students, or language use by parents, teachers, school leaders, university lecturers, and government officials. Incentives and disincentives for language use in the governmental, private and public spheres are not a prominent part of official discourse.

Moreover, current plans and measures for raising the status of the state language while supporting the learning of Russian and English are incommensurate with the challenge. The National Center

14 See Appendix D regarding expected student outcomes for Kazakh, Russian and English.

15 See Appendix F for the National Testing Center *Study Guide for preparation for UNT* (2013)

for Educational Statistics and Assessment reports that in 2012, 58.8% of students were in Kazakh-medium schools in comparison to 57.9% in 2011. That 2012 figure is still below the percentage of ethnic Kazakhs in Kazakhstan. According to the National Center for Education Statistics and Assessment, in some regions students are on average achieving higher scores on the Unified National Test (UNT) in Kazakh-medium schools, however in general, students in Russian-medium schools are outperforming students in Kazakh-medium schools.[16] In addition, educators report that Kazakh-language professional development materials and learning resources for students are often linguistically speaking of poor quality. Until Kazak-medium schools are generally speaking perceived as being of equally high quality as Russian-medium schools, many parents will continue to choose Russian-medium schools, and the student population gains made by Kazak-medium schools may not continue to grow or may even diminish.

Greater co-ordination of initiatives and improved management of trilingual education is needed. In addition to better defining the levels of fluency students and educators are to achieve, and increasing knowledge about the consequences of investments that have been made elsewhere in the world into trilingual education, there is a need to:

- increase stakeholder co-operation;
- better co-ordinate planning interrelated initiatives;
- identify and manage knowledge;
- improve data collection and analysis that can be fed back into the planning process.

Making improvements to a system and expanding it is dependent on all of the above and in particular knowledge management. "Knowledge management is the process of capturing, distributing, and effectively using knowledge." (Davenport 1994, pp. 119-131) . The knowledge to be captured about trilingual education has generally speaking not been systematically identified, and mechanisms for distributing that knowledge are insufficient. For example, there is no broad agreement regarding what knowledge is to be captured about trilingual education. The management and pedagogical experiences of the 33 trilingual schools have not been systematically distilled, analysed and integrated with that of the Intellectual Schools and their partner schools. In addition, with the exception of AEO NIS, research knowledge about trilingual programmes in other nations has not been distilled, distributed and used. The above means that knowledge about local and international best (management and pedagogical) practices in trilingual education has not been synthesised and is not readily available and being used to inform further programme development and planning. This has implications, among others, for teacher in-service and pre-service training, for the training of librarians, for the development of learning resources, for working with parents and for developing assessment systems, and for scaling up or translating existing experience to new sets of schools. This also highlights the need for further stakeholder co-operation.

Improving the alignment of planning initiatives is another challenge. The 2013 educational standards foresee the introduction of three languages in pre-school, yet the standard educational plan does not foresee the teaching of Kazakh in Russian-medium schools in grade 1 or the teaching of Russian in Kazakh-medium schools in grades 1 and 2.[17]

Furthermore, teacher training colleges and universities appear under-equipped to teach about and research trilingualism and trilingual education or to prepare teachers to teach in trilingual education environments. There is little evidence that teacher trainers or teachers are aware of how pedagogy

16 See Appendix G, Distribution of UNT results between Kazakh and Russian-medium urban and rural schools.

17 See Appendix E, the MES Standard Subject Plan.

is adapted in trilingual education contexts. For example, in the case of fostering critical thinking this would involve supporting synchronised critical reflection on subject content and language(s), and concurrently providing detailed richly scaffolding of support structures for the learning of both language and content learning. When working with meaningful and cognitively challenging rich academic content, this would involve having teachers systematically create language-rich environments that encourage rich student output and draw connections between languages.

Furthermore, there is a disjunction between the government's ambitious plans for expanding trilingual schools and the capacity of teacher training institutions to train future teachers who could achieve a C1 level (CEFR) in a foreign language and at the same time support students in learning the Kazakh and Russian-language terminology in the subjects that they are teaching through the foreign language. Existing trilingual schools are having difficulty finding sufficient numbers of teachers to teach through English.

Equity and inclusion[18]

National priorities and international evidence

Successive documents stating the aims and values of education in Kazakhstan emphasise the country's commitment to respect the diverse population, to value inclusiveness and fairness, to promote an ethic of care extending from the family to the wider community (LERK, 2007).

Tackling inequities in education is a major priority for the government. The 2012 Resolution of the Government of Kazakhstan number 1080 declares that "Submission to the standard core content of the secondary curriculum provides…equality of opportunity and access to secondary education for all students" (paragraph 26.2). Apart from any general principle of fairness, inequities in educational provision serve to reproduce and exacerbate inequity in society as a whole leading to a waste of talent, to under-qualified, unemployable and disaffected youth and to social unrest. It also undermines Kazakhstan's capacity to compete internationally as reflected by international league tables. These consequences are all visible in Kazakhstan today, in spite of many government measures, which have sought to address the problems. The 2011 Crisis Group Asia report observes that:

"Although Kazakhstan has pursued reforms and invested in infrastructure, the outcome has been disappointing. The country will continue to experience social stratification in access to quality education and good healthcare. As elite schools and modern clinics in cities co-exist with their dilapidated counterparts in neighbouring villages, social tensions are likely to rise within a growing rural, southern underclass." (ICG, 2011, p.32)

We have to recognise that not all the inequities in society can be resolved through the education system alone. The development of the transport, sanitation and broadband IT infrastructure in rural areas, for example, raises wider policy and investment issues, but Resolution 1080 commits the country to building infrastructure that meets the sanitary and epidemiological requirements of students (paragraph 61.1) and to "the necessary light and air and heating, changing rooms, toilets and personal hygiene rooms in accordance with health and hygiene requirements (61.4)." There remains nevertheless, especially in rural areas, a very wide gap between the facilities that the government's own policy statements and building standards declare to be necessary and what is currently available.

18 This part of the assessment is based on desk research.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

There are:

- opportunities for minority language communities (e.g. Uzbek, Tajik, Uyghur) to set up schools using their own language as the medium of instruction;
- incentives to attract teachers and school principals to rural schools.

The government is making efforts to promote access to higher education for students from rural areas as well as other vulnerable groups, including orphans, Kazakh ethnic minority, children with special needs. In 2012, the government amended existing (2008) rules on educational grants to introduce a special quota for rural youth that allocates 30% of government grants to graduates of rural schools (LERK, 2007, Article 47 (par. 17). However, there is anecdotal evidence that during their last year at school, some students from urban areas are moving to rural schools, so that they may improve their chances of obtaining a grant. Grants come with a certain restriction (for young people applying to medical schools and pedagogical institutes) (Government of the Republic of Kazakhstan (2008), Par. 10). Upon graduation, young people are supposed to return to their previous place of residence to work for the following three years (LERK, 2007, Article 47 (par. 17). This is not always appealing to those from rural schools for whom higher education is seen as a means of advancement into a different world.

MATTERS THAT NEED TO BE ADDRESSED

The rural/urban divide

The most widely acknowledged inequity in the system, however, is between children attending urban and rural schools. The picture is not simple, but the clearest evidence of a problem is provided by the results of the UNT. In 2012, 63 788 students from rural schools and 53 545 children from urban schools took the test. The percentage of students from urban schools who received high UNT results was twice as high as in the rural schools (see Table 1). The same trend could be observed with the average UNT mark[19].

Table 1. Distribution of results between rural and urban schools (UNT 2012)

Points of UNT	Urban schools		Rural schools	
	Kazakh	Russian	Kazakh	Russian
0-49	13.34	6.35	21.92	10.86
50-59	13.72	9.52	19.73	14.88
60-70	19.43	17.21	21.82	23.25
71-89	29.81	35.11	24.64	32.83
90-100	11.7	16.71	6.67	10.83
101-125	12	15.1	5.22	7.36

Both in urban and rural areas students taking the UNT in Russian seem to perform better than those taking it in Kazakh (see Appendix J). Similarly, the World Bank's analysis of the last PISA scores indicates that:

19 The average UNT mark in urban areas was 76.16 points compared with 66.5 in rural areas.

> "Pupils enroled in the "Russian speaking" schools tend to score 53 points higher than those attending "Kazakh speaking" ones, whatever their actual native language might be. In fact both the inequalities and the low performance of the Kazakh school system seem to be linked to the heterogeneity of quality between "Russian speaking" and "Kazakh speaking" schools." (WB, 2012).

The reasons for these inequities need careful analysis. The World Bank analysis of differences in PISA scores suggests that the differences are not between rural and urban per se but are rather to do with the socio-economic environment overlaid by the ethno-linguistic issues indicated above. The previous sections of this chapter illustrate inadequacies of infrastructure and resources in rural schools, poor Internet access, and poor access to the sort of cultural capital available in urban environments, not least because of poor transport infrastructure in rural areas. The quality of the teaching in rural schools remains a serious issue, in both Russian-medium and, especially, in Kazakh-medium schools.[20]

Being fair to different language communities

Kazakhstan is a multinational country with more than 100 ethnic groups living on its territory. The existing school education system allows children to receive education in their native language. In 2010, out of 7 646 secondary schools,[21] not considering special correctional schools for children with special needs, Kazakh was the language of education in 3 828 schools, Russian in 1 573, Uzbek in 58, Uygur in 14, Tajik in 2, and English in 7. In 2 164 schools, education was conducted in two or more languages.[22] However, there is a certain disadvantage in being educated in a language other than Kazakh or Russian for 11 or 12 years, since all children will have to take the UNT in one of these two languages in order to apply to Kazakhstan universities. All children should be able to take such high-stakes assessment tests in their first language, except in those subjects being taught in other languages.

Focusing on institutionalised children

In Kazakhstan, many children are raised in state-run residential institutions, which cannot be considered as a favourable environment for a child. According to data obtained from the Children's Rights Protection Committee of the MES of the Republic of Kazakhstan, of the 4.5 million children in Kazakhstan, more than 14 000 are living in institutions for orphans and children without parental care. In addition, every year an estimated 2 000 children are abandoned or deprived of parental care, either at maternity wards or around the age of five or six when the state takes away parental rights (UNICEF, 2011b, p.10). Children who leave the institutions at the age of 18 often lack life skills, experience low levels of education, and in the future are likely to face stigmatisation, unemployment, and poverty. Moreover, these children are more likely to come in conflict with the law. According to a UNICEF report, institutionalised girls are likely to become pregnant at an early age, and many will place their newborns in state-run infant homes because they are unable to support and care for them (UNICEF, 2011b, p.10). Institutionalisation of children sometime is seen as the only way of resolving multiple issues in the family, including poverty, unemployment, or child disability. Big families, living in rural areas, with no access to schools, or families with children with special needs rely on the system of state-run residential institutions. Moreover, many parents have an incorrect

20 The quality of teaching does not, however, only depend on the qualification of teachers as according to the statistics provided by the MES in 2012: of 292 064 teachers in Kazakhstan, 87.9% had higher education, and the difference between rural (86.25% of teachers with higher education) and urban (89.54%) is not large.

21 According to the MES data, in 2012 there were 7 384 schools.

22 According to the Agency for Statistics the number of schools in Kazakhstan has decreased, Kazakhstan News, January 21, 2011, *http://www.newskaz.ru/society/20110121/1068447.html*

understanding that an institutional setting does not cause harm to the child (Virdee& Zimmerman, UNICEF, 2002, p.7).

Kazakhstan currently is developing alternative forms of child rearing, including foster care. However, more attention should be paid to the issue of children remaining in state-run residential care.

Equity and special education[23]

National priorities and international evidence

The Standard Rules on Equalization of Opportunities for Persons with Disabilities[24] define education as "a key area for equal participation." In accordance with Rule 6, "States should recognise the principle of equal primary, secondary and tertiary educational opportunities for children, youth and adults with disabilities, in integrated settings. They should ensure that the education of persons with disabilities is an integral part of the educational system." This usually implies that education of persons with special needs should be included in a national education plan, which provides for:

- development of educational materials;
- organisation of schools;
- identification of key elements of an inclusive education system;
- "special" education for people with special needs should play temporary role in meeting their needs.

The Final Report of the World Education Forum and the texts of the Dakar Framework of Action "Education for All" also emphasise the need to ensure, by 2015, universal access to free and compulsory primary education; to ensure that educational needs of all young people and adults are met through equitable access (Dakar Framework of Action, 2000).

In the Concluding Observations from June 19, 2007, the UNCRC noted that Kazakhstan was still trying to solve the problem of education for children with special needs by establishing special correctional schools, therefore the Committee recommended to adopt a strategy of inclusive education and to develop an action plan that will contribute to the education of children with special needs, and prevent their institutionalisation (Committee on the Rights of the Child, 2007).

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

The Constitution of the Republic of Kazakhstan provides for equal rights in education for all citizens, and access to education at all levels. The goals of education in the Constitution are in line with Article 29 of the UN Convention on the Rights of the Child. In accordance with the Law on Education of the Republic of Kazakhstan, the state provides necessary conditions for education, corrections of development and social adaptation of persons with developmental disabilities (Article 8, Paragraph 6). Article 49 mentions the right of parents and other legal representatives to:

- choose the educational institution taking into consideration wishes and individual inclinations of the child;
- receive advice regarding training and education of children in the psychological, medical and educational consultancy centers (PMPK).

23 This part of the assessment is based on desk research.

24 These rules were adopted by the United Nations General Assembly, forty-eighth session, resolution 48/96, annex, of 20 December 1993.

Moreover, the government has introduced an enrolment quota for persons with disability to study in educational organisations that provide vocational and higher professional education.

MATTERS THAT NEED TO BE ADDRESSED

With the ratification of international documents on child protection, including the UNCRC, the government of Kazakhstan has embraced the concept of inclusive education. However, it should be underscored that inclusiveness in schools should not be narrowed down to special education. Inclusiveness should not be interpreted as necessity for teachers to become familiar with the range of syndromes, disorders and "defects" of their students. Knowing these students as well as knowing 'techniques' of dealing with them through special educational practices does not make the teacher more inclusive. Inclusion is an aspiration for a democratic education and, as such, the project of inclusion addresses the experiences of all students at school; inclusion is about developing an education system in which equity is sought and diversity is welcomed (Slee, 2001). It seems that the word "inclusion" is often used for the sake of adding a progressive gloss without understanding the meaning. To make schools more inclusive for different groups of children (including children from vulnerable families, different ethnic groups, children with special needs, children of migrants, etc.), these groups of children should not be treated as a problem by civil servants, school administration, and society at large.

The existing system fails to provide adequately for students with special educational needs, including but not limited to those with physical disabilities. Majority of children with special educational needs in Kazakhstan are also abandoned and deprived of parental care while growing up in state-run residential institutions for children (UNICEF, 2011b, p. 8). The term "education for children with special needs" has emerged to replace the term "special education", which refers to the education of children that takes place in special schools or institutional establishments outside of the general education system. Attendance at special schools leads to the social exclusion of young people with special needs and other children may regard them as being marginal. The existence of special classes within the mainstream school does not allow these students to interact with their peers and benefit from social and interpersonal relations and creates an environment in which these young people may feel inferior or different from others.

In Kazakhstan around 70 000 children with special needs are attending regular schools, partly because there are an insufficient number of specialised educational organisations; specialised schools are remote from places of residence; and parents prefer to educate their children in the system of general education. In this situation, however, an estimated 85% of these students cannot grasp the material as it is presented to them in the classroom, and cannot get help from teachers as they lack special training in working with students with special educational needs (MES, 2010a).

In Kazakhstan, students with special needs face many obstacles in accessing the mainstream education system.

Physical barriers

Schools in Kazakhstan generally lack the necessary ramps, elevators, special desks, gym equipment, books or other resources, including transportation and special meals for children. In 2011, 96% of kindergartens and 83% of schools could not accommodate children with special needs (Tengri News, 2011).

Lack of information and knowledge

The lack of information and understanding among civil servants, teachers and school administrators regarding inclusive education is another major obstacle to the education of students with special needs. Most of the faculty and administration in schools and universities are not familiar with the definition of "inclusive" education. According to the analysis done by Sandzh, the idea of "inclusive" education provokes a mixed reaction (Center Sandzh, 2008) The results of the Sandzh survey, which included officials of the departments of education, protection of the rights of the child, and social protection, administration of integrated schools, teachers, professionals working with children with disabilities, and media representatives, demonstrate that only one-third of the respondents supported the idea of inclusive education. Just over a third of respondents mentioned they understand the idea, although this group cannot be considered as its supporters or opponents. Nearly 10% did not specify their attitude or demonstrated their indifference to the problem. One respondent in four among people working inside the education system expressed opposition to inclusive education of students (Appendix H).

There is a disjunction between the government's aim to create a competitive education system that respects the needs of all students and the current reality in schools. Much remains to be done.

Teacher preparation and Continuing Professional Development

National priorities and international evidence

"... ensuring that teachers are capable of improving student learning - and that school leaders are able to help them do so - is perhaps the most significant step [policy makers] can take to raise student achievement." (Darling-Hammond&Rothman et al, 2011, p.1).

The effectiveness of teacher preparation and professional learning has been identified as one of the cornerstones of a good education system and of high quality student learning. For many countries it has become the priority for developing a high quality education system. A summary of studies of school and student achievement factors points out:

"In brief: better-funded school districts, schools within those districts, and classrooms within those schools seem to be able to attract teachers with higher levels of education, more experience, and higher scores on competency tests; and these teachers, in turn, help to generate better achievement scores among students." (Biddle&Berliner, 2002, p.23),

A growing body of international evidence (CERI, 2011; Darling-Hammond&Rothman et al., 2011; Mourshed et al., 2010) has identified the key issues for teacher quality as:

- the recruitment of qualified individuals into the profession;
- their preparation and induction;
- their professional learning and development;
- their evaluation and career development;
- their retention.

The Mourshed et al. study identified building the technical skills of teachers and principals, often through group or cascaded training, as one of the most effective six key interventions policy makers can use (Mourshed, eds. 2010, p.28).

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

- Many of the issues related to teacher effectiveness set out above have been identified by those working with and within Kazakhstan.[25] Currently, several actions are being undertaken, such as: a reform led by the MES working with NU to make changes in the pedagogical institutes' programmes; a national system of professional development including the Centers of Excellence programme; ORLEU has become one organisation and has a national system of Continuing Professional Development (CPD); developments in teacher pay linked to the Centers of Excellence programme; and developments in NIS in the systems of attestation, pay and career progression.

MATTERS THAT NEED TO BE ADDRESSED

Some progress has been made but teacher development remains a central priority in improving the quality of education in Kazakhstan.

"It's a system thing, not a single thing." (Mourshed et al., 2010)

There needs to be a systemic approach to integrate the different elements of teacher preparation and development; this requires co-ordination and integration of these elements that need to be linked: recruitment; preparation; induction; continuous learning; career development. Presently, this is not the case in Kazakhstan. The tables in Appendix N on Teacher Characteristics show that:

- over 50% of teachers have between 9 and 20 years of experience with the majority having over 20 years of experience;
- the majority have qualifications in the first and second category;
- the majority are over 30 years of age;
- 87.9% have completed higher education;
- the majority are female (80.2%).

Get it right at the start

There are serious issues regarding the recruitment and selection of high quality candidates for teaching in Kazakhstan. Motivation and commitment to teaching are key factors in preparing good teachers and at the moment there is no way of using these factors as selection criteria. Table 2 compares international best practice with the situation in Kazakhstan and other matters related to teacher effectiveness.

25 Examples include speeches by the Minister of Education and Science in Astana on May 24, 2011; on 31 January, 2013; on 26 March, 2013 and the UNESCO report.

Table 2 Comparing international best practice with the situation in Kazakhstan

International best practices	Situation in Kazakhstan
Entry into teacher education programme is extremely selective and it focuses upon motivation, commitment and capability	Entry into teacher education programme is regulated by UNT
Screen candidates to ensure that their attitudes are in line with that which make teachers effective (Finland uses a two stage process: 1) first looks for top honours, and 2) then examines students' understanding of teaching)	There is no screening of candidates
Requirement to earn at least a Master's degree in education, including the primary grades	There is no requirement to earn a Master's degree. Primary teachers can graduate from VET.
Possibility to pursue part-time Master's degree and Ph.D.	Master's degree and Ph.D. students are perceived as overqualified specialists for school teaching No motivation to earn part-time Master's or Ph.D.
Make teaching attractive and high status profession	Least attractive profession and not high status
Teacher annual salary (USD 41 000 in Finland; USD 37 000-90 000 in Ontario)	Average annual teacher salary - USD 3 360
Significant autonomy makes a difference, high trust in teacher's judgment and assessment	Very little autonomy. Centrally prescribed curriculum and assessment.
Continuous feedback from the principal and other school faculty members	High control and regulation of teachers' practice.
Highly desirable teaching conditions (teacher's instruction hours are short, more time for planning, meeting with students and other teachers, bestows annual awards for excellent teachers, recognition of teacher research work, opportunity to do additional qualification programmes)	The teaching load (stavka in Russian) system pays teachers by the teaching hour and compensates them additionally for grading student notebooks and other pedagogical and non-pedagogical tasks. The current salary structure perpetuates the belief that teachers should be compensated for everything additionally, including for other pedagogical tasks. This applies to those in pedagogic institutes too.
Career ladder programme provides opportunities to grow professionally and take on leadership responsibilities, based on demonstration of competence.	

There is a disjunction between the desired changes in pedagogy and schools and the preparation and development of teachers. The radical reform of initial teacher education needs to be undertaken urgently, not merely by adjusting curriculum, since it is causing other systems of teacher learning, e.g. the continuous professional development system of ORLEU, to be engaged in constant compensation. Even though developments are currently underway, there is still a need for:

- developing large scale faculty in the pedagogical institutes;

- collaborating more closely between university-based teacher educators and schools including the involvement of teachers in programme and curriculum development;
- piloting and planning changes on a realistic and integrated time scale;
- aligning the reforms in schools to the reform of teacher education

The growing gap between the desired innovation and the preparation and support of teachers is a priority problem that needs to be addressed. A UNICEF study (UNICEF, 2011b) of the region found that the disparity between the stagnant and the progressive has led to an innovation gap between pre-service education and in-service training over the last several years." The change in initial teacher education needs to be a sympathetic and profound reform. The pedagogical institutes seem to be isolated and separate from other systems. There needs to be a programme for reforming and supporting teacher educators. This is true for all areas of education and there is a need to think of early years professionals as educators alongside the other educators in the system.

Importance of continual learning and professional development throughout the teacher's career path

ORLEU has described how it is working towards a "new paradigm" of learning and practice. This should be deeply understood and embedded. There is a need to plan for "mindset" change and growth, and to have a clear accompanying plan for how to accommodate change and work on an understanding of the desired changes in pedagogy and learning. Shulman (Shulman&Shulman, 2004) has argued that the features of accomplished teacher development, and thus of teacher learning, are: vision, motivation, understanding, practice, reflection, and community.

This suggests that teacher learning needs to be:

- frequent, and the current system of professional development every three to five years seems unfit for purpose;
- based on a real needs assessment;
- close to practice, and this suggests much more school-based professional development and learning and the development of the conditions for teacher learning in schools;
- supported by conditions for teacher learning in schools, so that every school can be a learning school;
- based upon a clear view of teacher and pupil learning;
- supported by internal and external processes of learning.

The importance of leadership

- There needs to be an explicit focus on leadership at all levels of the school within the professional development programme. The opening statement (cited earlier) by Darling-Hammond & Rothman (Darling-Hammond&Rothman et al, 2011) underlines how important senior managers in schools are to effective reform and development preparation and leadership education.

The need to have a fit between learning, career development and other processes

Career development and attestation are also issues. All phases and aspects of teachers' career development need to be linked to conditions to promote collaborative learning and development of practice. This requires an assessment of the reward, review and appraisal systems and for these systems to be connected to teacher growth and learning, creating a systemic synergy. Appendix M contains a description of the current attestation system.

The current system of attestation seems to run counter to these goals. Clear standards are needed that fit a distinct vision of the teacher, the school and professional learning to feed into policy. NIS is developing such standards and processes. Subject to these processes and standards being found helpful, they will be rolled out or at least evaluated. There are certain models of teacher promotion, e.g. payment by results, that would run counter to the aims since they contain a narrow view of student achievement – see the section on curriculum for a wider discussion of this. Payment by results will also undermine the work towards the wider aims of education for democracy and independence (Meyer&Benavot, 2013, p.12). Providing only financial reward runs counter to the desire to develop teachers as highly functioning professionals, with an emphasis on wide learning goals and outcomes in the curriculum. The characteristics of good teacher development as demonstrated in Table 2 need to be supported through the surrounding systems of reward and review. Appraisal systems need to be in place to examine teachers' performance and this needs to be more complex than a payment by results system with very narrow measures of performance.

Buildings and Infrastructure

National priorities and international evidence

The priorities that drive the need for improvements in curriculum, pedagogy, assessment, teacher development etc. are the same, i.e. the need to achieve higher standards of education appropriate to the demands of the modern age. But these cannot be achieved without a sound school infrastructure and good quality facilities that are important conditions for student learning and the actualisation of the educational goals and objectives. Students cannot learn to work with modern scientific tools and methods without access to those tools; they cannot become computer savvy if they do not have access to a computer and through the computer fast connectivity to the Internet. It is of no use saying that children with special educational needs and disabilities should be included in mainstream schools if the design of the buildings makes them physically inaccessible to many of these children.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Government departments are well aware that there is a huge backlog of requirements for the improvement of school buildings, infrastructure, equipment and resources. There are of course ongoing work for their improvement. In some cases this means replacing old buildings; in others their repair and development. The development of the 12-year curriculum is prompting some restructuring of secondary education and, with this, some new buildings. The newly constructed NIS schools set an enviably high standard both for construction and equipment. But much remains to be done and there are many ways in which school buildings and infrastructure fail to meet even existing standards and requirements.

MATTERS THAT NEED TO BE ADDRESSED

- Many school buildings remain unfit for purpose. One 2010 estimate (MES, 2010a) indicated that one third of schools functioned in makeshift buildings and one quarter required capital repair. With a shortage of 81 000 student places, over one third of secondary school students have to study in a second shift, which according to the National Report on the State and Development of Education, negatively impacts on children's performance in the UNT (NCQAE, 2012, p.57). More recent figures suggest that there are still 189 schools, due to their age and lack of maintenance, are in emergency condition; and 92 schools operate in 3 shifts (Education Statistics 2013). In the south, where there is a rapidly growing population, the administration is trying constantly to find enough places for the growing number of children.
- There are state standards to which existing buildings are supposed to adhere with respect to sanitary norms such as drinking water, gym and playing areas, and provision of school meals and transportation for children. However, in 2010 37.4% of schools had no access to drinking water; every sixth school lacked either a dining area or canteen; and 26% of schools lacked adequate physical education space and equipment. We recognise that the poor infrastructure of rural areas itself limits the possibility of complying with the sanitary norms and requirement in schools. Provision of school facilities however, should be a part of the wider infrastructure project that provides rural communities with public transport (also important for accessing education), safe drinking water, sanitation, etc.
- The gap between current curriculum requirements and actual provision of resources to implement that curriculum is substantial. A large number of schools have insufficient laboratories that would allow for regular practical work in physics 18.2%, chemistry 30 %, biology 27.6% and language 39% (National Report on Education, 2012). Schools are not provided with adequate science laboratories, even though the state curriculum and regulations require such facilities. If students are to engage in more practical and inquiry-based science, then it will not suffice to provide equipment only for the teacher to use for demonstration purposes.
- If the Intellectual Schools curriculum and its requirements in terms of facilities and resources are to be introduced into mainstream schools, there will also be a raft of new demands. Appendix K lists, for example, the equipment requirements for teaching grades 6-11 biology. Few, if any, ordinary schools would have nearly so many requirements. It will be difficult to provide the same level of resources as in the Intellectual Schools, but their standards should provide a benchmark for the medium-term development of the entire education system.
- Kazakhstan is beginning to recognise the significance that ICT and E-learning resources have for the future development of education and a modern economy. The new generation of schoolchildren will have mobile technology at their fingertips[26], and schools will be hard pressed to keep up with their requirements (as well as being challenged by the implications of the technology for teaching and learning). Access to the Internet is available in 99% of schools, though broadband is available in only 43% of schools. This inhibits Internet access. There has been an increase in the number of computers and other technologies (e.g. whiteboards) in schools over time. Most schools achieve the baseline targets ratio of 12 students per computer, but competing economies are aiming to equip every child with a laptop. In 2009, in almost all countries in Europe, at least 75 % of the students were studying in schools with one computer for up to four students. Over the last 10 years, there are fewer

26 Some 27 000 such devices were confiscated from children entering UNT test rooms in 2013, according to some reports. Children know how to use mobile technology to obtain information.

disparities between schools and there are between two and four students per computer in schools in most European countries. In addition, a large proportion of children have access to computers at home. Access at home is virtually universal in wealthier countries like Finland, Germany, Denmark and the UK. In 2009 it was still below 60% in Greece and Slovenia but, for example, Latvia, Lithuania, Slovenia, Hungary and the Czech Republic had all risen to or above EU average rates by 2009 (European Commission, 2011). In addition, many teachers have only limited confidence and competence in the use of ICT and even those who use ICT often treat computers as electronic textbooks rather than as a dynamic and interactive learning resource that links students to the world. Greater investment is needed in training teachers in the use of ICT as well as providing children with the technology to access it.

Finance

National priorities and international evidence

In general, the goal of the Kazakhstan education system is defined as "increasing competitiveness of education and development of human capital through ensuring access to quality education for sustainable economic growth." From this perspective, national priorities in secondary education are identified as:

- improving equitable allocation of public resources (shifting to per capita funding);
- improving the quality and accessibility of education;
- improving the quality of teacher training;
- enhancing prestige of the teaching profession;
- improving inclusiveness of education;
- addressing the issue of small and ungraded schools;
- ensuring equal access to the best educational resources and technology (MES, 2010a).

All of these priorities will invariably require different patterns of resource allocation, including the need for additional expenditure on education.

ACTIONS ALREADY TAKEN AND ISSUES THAT NEED TO BE ADDRESSED

The main sources of funds

In theory, secondary education is financed from two sources: national budget and regional budget (Budget Code, 2008). In practice, these sources are supplemented by individual and private effort. Our visits to schools and inspection of school accounts revealed that schools rely significantly on local sponsors and that teachers and school directors do not make a significant personal contribution to the school financially or in kind (e.g. in one case supplying wood for the boiler).

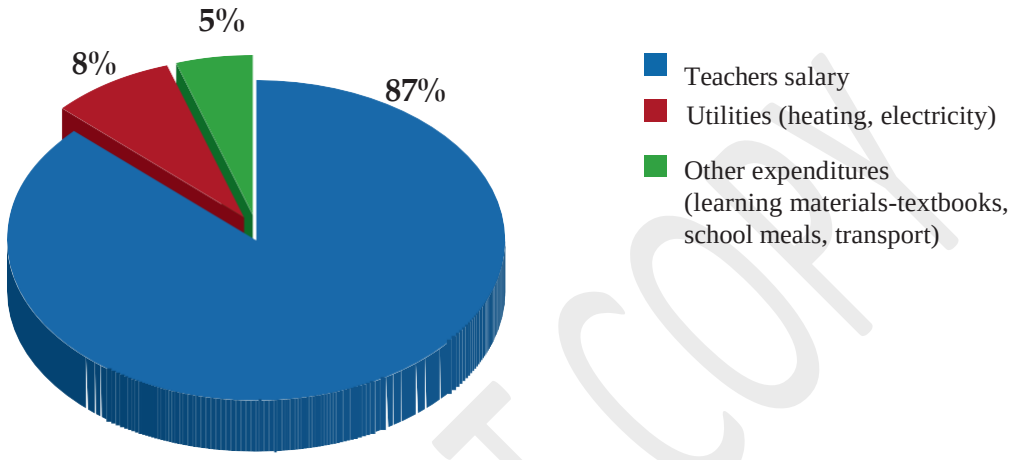
Seventy percent of the total expenditure on education comes from the regional budget (NCQAE, 2010), which is funded from tax revenues of the *Oblast.* It covers maintenance as well as teachers' salaries and implementation of their own regional programmes, although one school we visited relied heavily on voluntary working groups from the local community. National budget covers the cost of educational subsidy and targeted transfers to the regions that are in need of financial support.[27]

27 From the interview with Finance Department, the Ministry for Education and Science ,June, 2013.

In the national budget, the cost of schooling is separated into recurrent and development costs. Development costs, which include buildings, new equipment and furniture, are often considered separately from recurrent costs as they are usually incurred to meet specific needs and are regarded as investment over a substantial period of time.[28]

Recurrent costs are divided into salary costs (teaching and non-teaching staff) and non-salary costs (e.g. learning materials, transport, maintenance and other operating costs, such as school meals), see Figure 1 below. Most costs are at school level, but some costs for services such as curriculum development and teachers' professional development, are at national level (Budget Code, 2008).

Figure 1. Structure of recurrent school expenditure (average within Kazakhstan)



Source: Institute for Budget Solutions (2011)

The greater proportion of school funds is allocated to salaries, and only a small amount of total recurrent expenditures is available for learning materials. School budgets rarely include items that support the pedagogical process, such as teaching aids, methodological literature and office supplies. As a result, school directors and teachers provide their personal funds for pedagogical materials. School teachers have to use their salaries to cover essential teaching requirements and other materials (Sandzh Research Center and Soros Kazakhstan, 2008). In one case that we encountered this extended to providing logs to burn to keep the school warm. This lack of discretionary funds for consumables and learning support materials hinders the effective operation of schools. It also makes teaching less attractive as a profession as the already low salaries for teachers are diminished by the diversion of personal funds to purchase school supplies.

School Budgets

School budgets are determined according to the norms on educational inputs and normally do not exceed the budget allocations of the previous year.[29] Schools receive the same funding for the current year as they did for the previous year, modified up by a few percentage points. The budget is formulated by using the norms on inputs such as the number of classes (regardless of the number of students per class), base salaries for the weekly teaching loads (*stavka*) and salary supplements for additional work, and the size of buildings (square meters).[30]

28 Ibid.

29 From the interview with rural school head teacher (June, 2013).

30 From the interview with Finance Department MES (June 2013).

Children with special needs

Additional costs associated with the provision of education for children from lower socio-economic backgrounds and special educational needs are partially regulated. The Law on Education (LERK, 2007, Article 8) stipulates that the state fully or partially covers the cost of supplementary needs. The categories of children eligible for supplementary funds are: orphans and children left without parental care; children with disabilities and learning difficulties; children from large families[31].

The level of development of inclusive education in Kazakhstan is extremely low. Generally, children with disabilities are educated in special institutions, separately from mainstream schools. To some extent, that is due to the shortcoming of the funding mechanism that does not support inclusion of such children in regular schools. Some factors increase the cost of providing access to the mainstream curriculum to children with disabilities, as they require additional resources such as additional teaching time, specialised learning material and facilities. Without having support from the government, schools are often reluctant to enrol such students, as inclusion will need additional funds that are not included in the current school budget.

There are existing norms that regulate provision of free school meals and textbooks to eligible categories of students. Provision of meals and textbooks is at the discretion of the regional (*Oblast*) level budget. There is a substantial variation in provision of free school meals between the *Oblasts*, for instance some *Oblasts* manage to provide all eligible students with free school meals, in the others (Almaty, Atyrau, Akmola) coverage is substantially low (NCESA, 2012).

Teachers salary "stavka" system

The teacher salary structure in the *stavka* system is fragmented, complex and difficult to administer. The base salary is defined in terms of the statutory teaching load (*stavka*), which is equal to 18 contact hours per week. All other activities, such as grading student notebooks, managing a laboratory, etc. are regulated and compensated (or not) separately (MES, 2009). Many initiatives that attempt to strengthen student-centerd teaching methods do not sufficiently consider the limitations of the *stavka* system in terms of additional pedagogical work. Student-centered teaching requires additional out of contact work, such as additional lesson planning and student evaluation for which teachers are not compensated (UNICEF, 2011a).

The *stavka* system has also been criticised for being fragmented and non-transparent. To some extent, this is due to the fact that school principals assign additional teaching hours or deductions from salary supplements at will. Recently, there have been increases in teachers' average salary, however, salaries still remains low compared with other sector professions. On average teachers are paid KZT 80 386 (USD 535) per month which is below the average Kazakhstan salary of KZT 109 970 (USD 733), see Table 3 below (ASRK, 2013b). See Appendix L for a comparison of teachers' salaries across OECD countries. Due to the low salary level, teachers take on as many hours as possible to make more money, but such practices have a negative impact on the quality of education.

31 Ibid.

Table 3 Average monthly salary in Kazakhstan by occupation in June 2013

Average salary per month	KZT (per month)	USD (per month)
Average salary within the country	109 970	733
Science and technology, professional	199 393	1 329
Mining	197 672	1 317
Finance and insurance	185 729	1 238
Information and communications technology	165 159	1 101
Industry	132 686	884
Transport and stock	127 323	848
Construction	120 896	805
Manufacturing	110 858	739
Public/civil service	107 488	716
Retail and trade	102 215	681
Electricity supply	99 068	660
Catering service	93 162	621
Healthcare	88 293	588
Education	80 386	535
Leisure and entertainment	75 264	501
Agriculture, fishing, forestry	61 474	409

Source: Agency for Statistics of the Republic of Kazakhstan 2013

As a final point, the new plans to reward teachers for the number of their students obtaining good UNT results and medals are counterproductive.[32] They are bound to undermine the system as a whole and reinforce inequities.

Per capita funding

Per capita funding formula is an instrument of education policy and should therefore be consistent with the policy objectives set for the school system. The principles determining funding responsibility need to be aligned with the national strategy, education policy and values the government is pursuing.

32 See General Secretary of the MES Ali Galimova's 12.06.2013, Channel one interview, *http://www.1tv.kz/ru/news/video/12062013/sistema*

For instance, one of the current policy priorities is to promote equity, hence it is a national funding responsibility and requires appropriate resource allocation. Similarly, an objective to strengthen rural schools and communities, improve quality and promote language policy, needs to be reflected in funding arrangements.

Kazakhstan will shift to per capita funding by 2015 (MES, 2010a). The new funding mechanism will be implemented nationwide; however, small size schools will remain under the old normative model and will be funded on "class" base (Institute for Budget Solutions and UNICEF, 2011). This decision is driven by the desire to preserve small size schools, which represent 56% of all schools in Kazakhstan, and protect them from being undersupplied. Small size schools aiming to provide educational programmes similar in breadth and quality to the curriculum of larger schools, inevitably incur higher per student costs due to limited enrolments and small student-teacher ratios. Under the current finance system all types of schools are funded on the basis of common norms regardless of the number of students enroled, and needs of small schools are addressed equally. Moreover, teachers' salaries in rural schools are 25% higher than in urban schools (Government of the Republic of Kazakhstan, 2007).

Currently there are 4 225 small size schools that enrol 16% of the school age population, 150 of such schools are located in urban areas and 4 075 in rural areas.[33] According to state regulations, primary school should be provided in the settlement that has at least 5 to 40 primary level students, secondary schools in the settlement with 41 to 80 secondary level students, and high school in the settlement with at least 81 to 280 students.[34] Indeed, a geographically well-distributed network of small rural schools is precisely the basic system that Kazakhstan possesses to provide universal access to education for all children, irrespective of their location in the country. Obviously, national priorities emphasise equity and the principle of equitable resource allocation for small schools is in place. On the other hand, education expenditures continues to increase (addressing the needs to improve infrastructure and facilities, teacher training and retraining, increase of teacher's salaries etc.), given the lack of public resources, more attention should be given to improving the efficiency of resource allocation, which might require rationalising school networks and revising staffing norms.

An average class size across the Kazakhstan is 16.2 students (NCESA , 2012) with the student to teacher ratio being 8.2 (ASRK, 2012). In comparison with OECD countries, the average class size is 24 students and the student-teacher ratio is 14 (OECD, 2011). See Appendix M for a comparison of spending per student across OECD countries and expenditures on education as a percentage of GDP.

Table 4. Average student to teacher ratio in different types of schools of Kazakhstan in 2012

	Total	Normal (regular) schools	Small rural schools
Teachers	307 972	232 377	75 595
Students	2 533 930	2 136 392	397 538
Ratio	8.2	9.2	5.2

Source: Agency for statistics of the Republic of Kazakhstan (ASRK, 2012b)

33 "Statistics on small (multigrade) school", Department of Secondary and Preschool Education, Ministry for Education and Science of the Republic of Kazakhstan, 2011

34 "Concept for development of multi grade school 2010-2020", Ministry for Education and Science of the Republic of Kazakhstan

Furthermore, to allocate funding to small schools on a class basis, the funding agency, MES, should introduce regulations (norm) that will govern the structure of classes in small schools, paying attention to curriculum requirements, for instance, taking into account the need for subject specific class division in secondary level or the requirement to teach two or three languages. Currently, class structure in small schools is determined by the circumstances of a particular school and depends on the number of students and teachers. There are norms for small schools that define only the maximum class size allowed for combining two classes. For instance, if two classes are to be combined, the total number of students must be less than 25. If it is 3rd and 4th grade classes that are combined, the number of students must be no more than 15 (MHRK, 2009).

International practice suggests that a particular feature of per capita reform includes decentralising decision making to varying degrees and, to a larger degree, greater autonomy is given to schools to spend allocated funds, which schools should be prepared to take. Increased autonomy in school financial management will require head teachers having professional skills in budgeting and accounting. However, it is not yet clear what degree of autonomy and flexibility will be allowed for school leadership to manage school budgets in Kazakhstan, and the extent to which they are ready to take on this responsibility.

The new normative per capita funding formula will have 3 components:

- normative for provision of state compulsory educational standard. In average size schools, calculations will be based on the number of students. In small size schools cost unit will be based on number of classes.
- costs related to school building and its maintenance. This component takes into account the type and age of school building, climate zone and regional cost variation.
- grants for better performance and quality

This component is meant to provide financial stimuli for improving education quality. The schools that show better performance on Rayon, Oblast and national levels will be awarded additional grants. School management can then decide where to direct these resources: to give bonuses to teachers, invest in school facilities or hire additional personnel (Institute for Budget Solutions and UNICEF, 2012).

Though this component of the formula aims to encourage the improvement of student performance and competition between schools, it can arguably be a good mechanism for quality enhancement and equity. It is widely acknowledged that students' background characteristics have a great impact on education outcomes, hence poor performance of some schools in disadvantaged areas might be due to the nature of their intakes, not necessarily due to inefficiency of the school. Generally, secondary education schools and gymnasiums that have good performance records can be more selective of their intakes compared to regular schools, therefore better student achievement in such schools to some extent depends on the school's selection policy. One possible implication could be that more resources would be directed to schools that have already had an advantage, rather than supporting improvement in schools with less successful student body. Inappropriately designed bonus systems tend to reward those already advantaged by population, scale or history.

The new normative per capita formula is meant to increase equity and inclusion by providing greater resources for students with disabilities and from disadvantaged backgrounds (Institute for Budget Solutions and UNICEF, 2012), however, a need-based component is not actually reflected in the formula. It is unclear which of the three components will account for students' supplementary needs. International best practices indicate that a need-based element is one of the components of the funding formula, and that it is applied in most OECD countries.

Funding formula in OECD countries

There are four main components used in the school funding formula in OECD countries (Ross & Levacic, 1999).

Component 1: student number and grade level

Most formulas allocate funds to schools mainly on a student number basis, which is typically adjusted according to grade or age level. All the budget allocations are based on projections of expected enrolment numbers prepared by the local education authorities together with the school. Fluctuation of student numbers throughout an academic year is addressed by including in the formula a retention rate of 95%, which is later corrected to reflect actual student numbers.

Component 2: curriculum enhancement

Curriculum or education programme-based variables acknowledge the different resource implications of enhanced and specific education programmes such as music, languages or sports education. Higher costs can arise from additional courses, more expensive teaching materials, higher salaries for specialist teachers, and so forth.

Component 3: students' supplementary needs

Needs-based variables are included in school funding formulas in order to take into account the additional resource needs of teaching pupils with learning disabilities or who come from disadvantaged socio-economic backgrounds. The additional resources are meant to provide further help for such students by offering them, for example, additional teaching time, specialised learning material. This is meant to advance equity of education.

Component 4: School characteristics-based component

The school characteristics-based component reflects the cost differentials arising from the size of the school, the relative isolation of the school's community, physical aspects of the school premises, and regional cost variations. School size substantively changes the per student costs of education: small schools are typically more costly per student than larger ones. Isolated and rural communities tend to incur higher costs due to extra traveling expenses, for example. Some school buildings are older or too big costing more to sustain. Regional price level differences impact most cost factors often including teacher salaries as well as more obvious factors such as heating costs.

Funding formulas are tied to the national context and policy priorities of each country. The relative importance of the components in a specific formula reflects the emphasis placed on a particular education policy. If a formula is designed within the context of social policies for supporting the particular needs of communities and individuals, it will largely encompass components 3 and 4. In contrast, if the formula is designed to support change towards certain curriculum area, there will be greater focus on component 2 (Ross& Levacic, 1999).

The Management of Change

National priorities and international evidence

National priorities, including those for education have been articulated in a series of government strategy papers such as the 2030 Kazakhstan Strategy, the 2050 Kazakhstan Strategy, and in the SPED for 2011-2020. Kazakhstan has chosen a road of rapid and widespread reform. Both the pace and extent of the planned education reforms are exceptional.

The rapid and successful implementation of widespread and complex education reforms is directly dependent on the quality of the knowledge, skills and thinking that a government and those that introduce its planned reforms bring to the reform process. Innovations and reforms call for new and much improved, knowledge, skills and thinking. Consequently, it is essential to build the capacity of government and its agencies to lead and manage innovative change.

In addition, government cannot simply mandate the sorts of changes required to build a nation of patriotic, critical and creative thinkers, innovators and lifelong learners who actively contribute to nation building and making this a better world. Sufficient momentum for rapid, substantial and sustainable reform can only be generated by the joint efforts of teachers, school leaders, parents, students, government officials and agencies, university staff and other community leaders. Knowledgeable and thinking people who are continually seeking to learn more about education and who work in co-operation are part of the mix that makes for successful reform.

The following have been identified by researchers and practitioners as levers central to leading and managing educational reform initiatives that result in sustainable change: (Argyris, 2012; Bryk&Schneider, 2002; Darling-Hammond, 2010).

- understanding the change process (e.g. maintaining a focus on special and moral purpose; increasing coherence among various aspects of a planned change; relationship-building; knowledge creation and sharing; and building commitment among an organisation's internal and external stakeholders);
- understanding how educational reforms are scaled up;
- building leadership and management capacity on an ongoing basis;
- balancing accountability structures with those that foster initiative;
- focusing on quality and a reasonable number of ambitious goals;
- avoiding policy overload and fatigue;
- using results-based and effects-based planning, and monitoring/research of and transparent reporting on progress;
- fostering stakeholder involvement in planning and decision-making;
- focusing primarily on problem-solving as opposed to punitive actions;
- using a balance of qualitative and quantitative indicators to guide educational reform;
- avoiding indicators and incentives that undermine reforms (e.g. labelling schools, providing bonuses for high-achieving schools);
- having high standards and incentives for all including for special needs students and disadvantaged communities and schools;
- distributing leadership, and building productive learning environments for all members of the school community;
- maintaining a focus on respect, trust, co-operation and a constructive culture;
- eliminating corruption.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Much has been and is being accomplished – renewed educational standards, the establishment of Nazarbayev University, the establishment of the Nazarbayev Intellectual Schools which are to spearhead education reform in the country, the expansion of early years education, the development of Kazakh-language terminology and databases and specialised dictionaries, the development and implementation of the Bolashak Scholarship Programme, the establishment of a network of 33 trilingual schools, the development of the UNT and the Kaztest system, the establishment of Centers of Excellence to train teachers, and the establishment of the National Training Center ORLEU. The accomplishments are too numerous to detail and analyse in this section of the chapter. This plethora of initiatives – and there are many more across the education sector – also help to indicate the importance of the role of educational leaders and managers at all levels in the system and the onus of responsibility that falls upon them to manage complex change processes. It is our observation that few have received sufficient professional development in this role. There is a need across a number of areas for the development of capacity in the management of change, as well as the need to address other major obstacles to change.

Key requirements for the successful management of change

Management capacity

The capacity to manage change requires enhancement, and this at the national, regional and school level. Considerable local expertise has been developed in managing change. At the same time, many best practices in change management in general and the scaling up of educational change in particular are not being applied. For example, MES officials report being primarily focused on developing normative frameworks over providing leadership through the encouragement of stakeholder co-operation or guiding the management of knowledge. No evidence was seen of organisations undergoing thorough, systematic and sustained capacity building. Planning instruments shared with us were often vague, or if they included precise targets the means for achieving the targets were often unclear. More investment is required into systematic, transparent, results-based, effects-based and co-ordinated planning, and reporting. In addition, those who will have to implement planned changes appear to be under-involved in the planning process which means they are less likely to understand and agree with planned changes. Piloting is being under-utilised and learning from the implementation of existing pilot projects is insufficiently distilled. Insufficient attention is being paid to planning and analysing the translation of experience from pilot projects to other schools and to the education system as a whole.

Stakeholder co-operation

Stakeholder co-operation is being under-utilised. Stakeholders are any individual, group or organisation that can be affected by or influence the development of secondary education. Organisations whose work is interdependent are under-co-operating. This is exemplified by the disjunction reported in other chapters of this report[35] between pre-service training, educational standards, textbook development and the UNT which are either undermining or insufficiently supporting the national goal of fostering the capacity in students to think critically. In addition, teacher training institutions have been under-engaged in reform initiatives. Moreover, they have

35 See the chapters National standards, curriculum, assessment, textbooks and pedagogy in secondary schools and Teacher Preparation and Continuing Professional Development.

not received the help they need to reform themselves so they can better support the government's plans. This lack of stakeholder co-ordination has led to a lack of alignment among plans and in particular between high level government goals and plans. Consultations with stakeholders appear too often to consist more of one stakeholder informing another than in open dialogue leading to true mutually supportive partnerships. Considerable concern was expressed in organisations about not overstepping the given organisation's area of responsibility. Protection of intellectual property was cited as a motivation for not sharing information despite the fact that the property was created with state resources and meant to serve a wider public. Mechanisms and incentives do not appear to be in place that would encourage deeper and more effective forms of co-operation.

Mindsets

Mindsets are a major obstacle to change, yet officials lack strategies to help people to develop more of a "growth mindset"(Dweck, 2006) or to deal with "immunity to change."(Kegan & Laskow, 2009) Leaders and managers require professional development in raising self-awareness and undertaking the personal changes which are central to leading, managing and supporting the planned education reforms.

Reporting

Public reports need to better identify challenges and problems to be addressed. Although stressing the many accomplishments being achieved in the educational sector is valuable for identifying and celebrating short and long-term wins, the identification of specific problems and challenges to be discussed and solved has yet to have been normalised. Incentives for identifying and discussing problems seem to be smaller than incentives for listing accomplishments. Improved planning instruments with more nuanced and effective use of success indicators could also facilitate reporting.

Corruption

Corruption also appears to be a significant obstacle to education reform. We were informed of, for example, several incidents of local government officials insisting on a 10% kickback from schools on their allocated budget, and principals expecting teachers to pay a bribe for signing attestation documents. In such circumstances trust breaks down within the given school and community. It is highly unlikely that those working in and with these schools could then collaborate and support each other to reflect on and improve their practice so as to enhance all pupils' learning. Government responses to corruption have at times created new problems (e.g. UNT, new procurement legislation).

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CHAPTER 2

Vocational and Technical Education

This chapter examines the objectives and strategies of the SPED including reform objectives, indicators, policy-making qualifications, standards and assessment. It will also provide an overview of governance, management, planning, funding and quality of TVE.

Introduction

This chapter presents results of the brief assessment, which focuses on the principle reform areas proposed in the SPED in the Republic of Kazakhstan for 2011–2020. A basis for the assessment involved interviews with the TVE senior administrators, professionals, and institutions and other bodies as well as the documents. There was no opportunity, however, to observe the real TVE processes and conduct an in-depth evaluation of structures and internal procedures developed in TVE. There is no evidence that all the opinions expressed in the interviews and the materials used in this chapter, are representative of the entire TVE system of Kazakhstan.

Current context

The principle aspects of the TVE system in Kazakhstan could be summarised as follows. TVE programmes in Kazakhstan are delivered by 797 TVE institutions (2012) involving 610 colleges, the rest being lyceums (which have been transformed into colleges following the recent amendments to the Education Act). Around 500 institutions are public and the rest are private. Twenty percent of TVE institutions are located in rural areas. A total number of TVE students exceed 588 000 of which around 185 000 graduate annually with teaching, economics and industry-related occupations as the most popular concentrations. Approximately 85.5% of the institutional staff are full-time employees. There are a total of 39 300 of TVE subject teachers, while there are 8 000 trade instructors.

Students can enter colleges after grades 9, 10, and 11 with varying programme lengths ranging between less than one year to more than three years. In 2011, 254 000 students enrolled in TVE after grade 9; 173 500 students enrolled after grade 10; and 163 900 enrolled after completing secondary schools with grade 11. Overall, 32.7% of graduates of general education continue on to TVE: 24.8% are admitted after grades 9_10, and 7.9% after grade 11. Students with incomplete secondary education who pursue general education programmes in TVE colleges are not awarded the secondary school certificate. Around 80% of students study full-time. In 2012, on-the job practical instruction was secured through more than 22 200 agreements signed between TVE providers and companies that secured 82% of students with on-the-job training places. In 2012, 73.6% of TVE graduates passed assessment on the first test. Some 60.0% of the TVE graduates joined the labour market while more than 20% entered higher education (HE).

In 2012, total participation among the 15-24 age group in formal TVE programmes (ISCED 3, 4, and 5B) amounted to almost 20.0%, which is comparable with many OECD countries (see Table 6). Around 21.1% of youth in this age group enter HE; 19.2% of youth continue general schooling (NCESA, 2013). Approximately 243 000 (41.3%) of the TVE students were funded by government grants while 345 300 (58.7%) paid fees.

The TVE system in Kazakhstan has been undergoing broad and fundamental changes in its structure and operations resulting in the following major achievements:

- restructuration of TVE institutions by changing the legal form of their registration as "communal public enterprises" and transforming vocational schools (technicum) and lyceums into colleges;
- separation between TVE policy making, on the one hand, and the related technical and delivery functions, on the other hand, through the delegation of powers to regions resulting in the enhanced operational and financial autonomy of public TVE providers;
- standardization of inputs and the TVE delivery processes through the development of occupational and educational standards and the student assessment requirements resulting in greater independence of skills assessment processes from the learning processes;
- increased involvement of stakeholders - industry sectors and individual employers in TVE through the establishment of the sector–based councils and regional councils, signing hundreds of student on-the-job placement agreements, and getting industry involved in student skills assessment;
- increased public investment in agencies and institutions providing technical support to TVE as well as in setting-up modern TVE colleges and refurbishing the existing providers .

TVE objectives and strategies in the SPED

TVE reform objectives and indicators

The SPED in the Republic of Kazakhstan for 2011–2020 sets out a new "national vision" of education for Kazakhstan to be, by 2020, an educated country with a smart economy and "highly qualified labour force" (MES, 2010, p. 7). The specific strategic aim for TVE is "modernisation of the TVE system in accordance with the demands of society and industrial-innovative development of economy, integration into the global educational space."

The principle TVE objectives stated in the SPED (see: Box 1) involve three provisions: i) improving the TVE learning content; ii) improving staff training; and iii) enhancing the prestige of TVE. There is however a gap between the vision and the strategic aim and the TVE Programme objectives. Linking TVE objectives to the national vision statement "achievement of the highly qualified labour force", requires that they are monitored through the indicators demonstrating the form that the qualitatively and quantitatively "highly qualified workforce" should take in Kazakhstan by 2020 and through what specific means and strategic trajectories the Programme's vision will be achieved between now and then.

Box 1: TVE objectives in the SPED

1. Updating the structure of technical and vocational education content in accordance with the requirements of industrial-innovative economic development
2. Development of infrastructure of staff training for economic sectors
3. Enhancing prestige of technical and vocational education

Source: MES, 2010, p.43

Among the target indicators for TVE system modernisation (see Box 2), the indicator describing improvement of results of skills assessment (share of graduates who passed the independent skills assessment) is a reasonable measure of TVE improvements. While the indicator for improving a share of the working and employed TVE graduates goes beyond the responsibilities of the TVE as the employment success of graduates is influenced by many other factors. The indicator of the share of colleges that passed "national accreditation" would, in other countries, be part of the quality assurance strategy rather than a separate target indicator.

Box 2. SPED's target indicators for TVE system modernisation

1. Out of the total number of assessment participants, 60% in 2015, and 80% in 2020 of the technical and vocational school graduates who pass the independent qualification assessment in the employers' associations at first attempt.
2. The working and employed graduates of technical and vocational schools in the first year after graduation who studied under the government grant scheme should reach 78% in 2015, and 80% in 2020
3. By 2015, 10% of the colleges should pass national institutional accreditation, and this should increase to 30% in 2020.

Source: MES, 2010, p.17

TVE development strategies

The roadmap for the implementation of the SPED (MES, 2011) combines various activities (activities 108-130) and additional indicators linked to the TVE objectives. However, these activities and indicators are linked simultaneously to all the three Programme target indicators for TVE system modernisation (shown in Box 2).

Although the SPED foresaw a number of changes in TVE, some of those changes are not clearly packaged and linked to the individual TVE objectives/outcomes. This means that even if a TVE funding system is improved, all the proposed councils are set-up and the national qualification system is up and running as planned by the Programme, the eventual outcomes of the reform may not entirely materialise. For the above reason, it was not possible to produce comments on specific roadmaps for achieving each of the TVE-related objectives (shown in Box 1).

Policy making in TVE

The TVE reform objectives of the SPED seem to be outlined however without direct links to the principle policies agreed in the international HRD Conventions and Recommendations and other principle documents of the ILO, UNESCO, and the EU. These documents are commonly viewed as the international policy benchmarks for HRD and enable national TVE systems to improve structuring, targeting, and comparability.

The major international TVE policy objectives commonly focus on four broad areas:

- relevance of TVE to the demand by the population (for personal development and social integration), stakeholders' expectations, and labour market needs (industry sectors, regional economies, and employers);
- equality of opportunity to access TVE and employment (involving issues of funding, availability and eligibility, bringing TVE providers closer to consumers, availability of adequate choice of TVE programmes, and related participation in TVE);
- quality of TVE delivery;
- efficiency of TVE systems and institutions (the efficiency of utilisation of assets and resources in producing the outcomes).

The current assessment could not identify any national TVE policy statement in which major long-term intentions of the government and stakeholders are described. It is noted, however, that the Law on Education of the Republic of Kazakhstan and the SPED contain a number of TVE policy provisions.

National HRD policies commonly aim to describe the national commitment to the above principle areas concerning TVE-relevance, equality of opportunity, quality of TVE, and efficiency of TVE delivery. In each of the above policy areas, a division of responsibilities between the government and the stakeholders may need to be identified. Policies may, for instance, include the government's commitment to the provision of free pre-employment training, the employers' and labour unions' commitment to labour force development, etc. National HRD policies commonly go beyond the provision of TVE for young people but also cover education and training for the employed, the unemployed, and those facing various constraints, etc.

Although the SPED contains a coherent variety of objectives, activities and performance indicators, it focused on selected TVE development orientations but did not sufficiently emphasise some other important objectives related to the above policy areas that are discussed below.

Relevance of TVE to the demand of the population and the labour market

International HRD policy documents recognise that technical and vocational education considerably contributes to the personal development and social integration, particularly of young people, resulting in meaningful private and social benefits. This means that TVE should be provided not only at the demand of the labour market (employers and industries) but equally so at the demand of the (young) population. Even if labour market demand for an educated and skilled workforce is limited and declining, general education as well as technical and vocational education and training should be provided while taking every possible precaution to avoid mismatches between demand and supply. In addition, many TVE graduates may also continue education after graduation or decide to start entrepreneurial activities or perhaps find skilled jobs abroad. Many technical college graduates give more thought than before to entering higher education programmes as they are able to select the areas for further learning or self-employment taking into account their TVE experience. This is expressly confirmed in the Law on Education of the Republic of Kazakhstan that states that education aims to ensure personal and social development (Article 3: Principles of the national education policy). However, the interviews conducted during the assessment revealed that major concerns of TVE managers were with producing skilled workers at the demand by and on direct agreements with enterprises.

The TVE delivery planning concept which links the government-funded "order for services" to the bilateral agreements-based direct demand for skilled workforce from individual enterprises is outdated and not applied in developed countries. Bilateral agreements between TVE institutions and companies remain, however, a reliable basis for ensuring places for on-the-job instruction. One of the most common policy objectives of TVE is to contribute to maintaining the sustainable enterprise, improving productivity and increasing employment. In this sense, TVE activities are to be driven by the demands of the labour market, which needs to be properly assessed and even anticipated. The issues regarding skills demand assessment and anticipation at national and regional levels are becoming ever more important in many other countries yet are not well focused in the SPED.

A quick glance at the occupational structure of the national labour force, in comparison with some of the EU member-states presented in Table 5, suggests that in Kazakhstan, a share of professionals in the national labour force (Group 2: 15.3%) slightly exceeds the same in the UK and Germany. A share of technicians classified on the basis of the International Standard Classification of Occupations (ISCO-08) (ISCO Group 3: 10.7%) is at the average or lower end of the EU. The proportion of the skilled workforce is 46.7% (sum of the ISCO occupational Groups 4-8). This may seem to be in line with EU averages except that the share of skilled agricultural workers is as high as 10.6%.

The major structural problem of the labour force is that the share of jobs which do not require any specific/identifiable knowledge and skills (ISCO Group 9) is very high reaching 24.4% with more than half being unskilled workers in industry, construction, mining and other technology-related sectors of the economy. The other half of unskilled workers come from services, sales, etc. This problem needs to be addressed by increasing the share of skilled workers through the production of new workers in the TVE system and upgrading qualifications of the employed workforce. This would enable, in the future, replacing the currently unskilled workforce and support the improvement of labour productivity. The share of unskilled workers in the economy should preferably be reduced to some 10%. Overall, the TVE system in Kazakhstan is currently responsible for training and replacing approximately three-quarters of the national workforce: servicing 57.4% of all the technicians and skilled workers (ISCO Groups 3-8) plus the need to reduce the 24.4% of unskilled workers (ISCO Group 9) to about 10%.

The occupational structure of the national labour force reflects the structure of occupied jobs at the time that the labour force survey (which is commonly implemented as an annual household survey) was conducted.

Table 5. Occupational structures in Europe, 2006 (%) in comparison with Kazakhstan

Groups of the International Standard Classification of Occupations (ILO, ISCO-2008)									
	Senior officials and managers	**Professionals**	**Technicans and associate professionals**	**Clerks**	**Service workers and**	**Skilled agricul-tural and fishery workers**	**Craft workers**	**Plant and machine operators**	**Elementary occupations**
EU averages	5.0-16.0	8.0-21.0	6.4-23.6	4.0-15.2	9.3-24.4	1.0-16.0	8.5-19.5	5.0-17.6	6.0-17.2
Kazakhstan	5.1	15.3	10.7	6	14.2	10.6	10	5.9	24.4
UK	15.4	14.3	12.3	13.7	16.9	1	8.5	6.4	11.2
Germany	5.7	13.2	20.9	12.3	13.4	1.8	14.8	6.8	10.6
Poland	6.7	15.7	11.5	7.6	9.6	15.9	15.9	9.2	7.5

Source: Future skills needs in Europe. Medium-term forecast. CEDEFOP. 2008; data on Kazakhstan by the Ministry of Labour of the Republic of Kazakhstan. April.2013

Participation in TVE

The best measure of participation in TVE is a share of the 15-24 aged group in various TVE programmes which may be classified by the International Classification of Education (UNESCO) as ISCED 3, 4 and 5B. To avoid difficulties of referring different programmes to the different ISCED levels, it is useful to compare participation of youth in all programmes. Table 6 compares Kazakhstan with some of the OECD countries as well as Russia and the Ukraine and demonstrates that youth participation in TVE in Kazakhstan compares well with many OECD countries and has outperformed that of Russia and the Ukraine.

Table 6. Comparative participation of 15-24 youth in ISCED 3, 4 and 5B TVE programmes[36]

Country	Youth 15-24 (000) 2006	ISCED 3 (Initial VET combined with general education after Grade 9)	ISCED 4 (Post-secondary non-tertiary)	ISCED 5B (Short-cycle tertiary vocational programmes)	ISCED 3 + ISCED 4 + ISCED 5B (All vocational programmes)	TVE participation as a % of 15-24 age group
		Semi-skilled / skilled worker	Skilled worker	Technician	All vocational awards	
Australia	2875.7	769 687		190 374	960 061	33.4
Republic of Korea	5982.8	580 274		1 317 325	1 897 599	31.7
Germany	9746	1 729 839	395 013	339 989	2 464 841	25.3
Poland	5820	1 180 964	215 739	20 745	1 417 448	24.4
Norway	579	124 230	4 829	7 178	136 237	23.5
Netherlands	1957	431 683	6 295	6 603	444 581	22.7
France	7913.7	1 457 240	15 894	508 932	1 982 066	20.3
Belgium	1274		52 878	193 063	245 941	19.3
Russia	23994	1 413 885	234 174	2 013 770	3 661 829	15.3
Ukraine	7266.8	326 213	175 667	582 855	1 084 735	14.9
Kazakhstan	12931.92(2012)				585 185 (2012)	19.96

Source: Participation in formal technical and vocational education and training programmes worldwide. An initial statistical study. UNESCO. UNEVOC. UNESCO Institute for Statistics. 2006; ILO Labordoc population database.

Equality of access to TVE and labour market

The equal opportunity of having access to education, training and employment is a fundamental international policy objective highlighted in all HRD Conventions and Recommendations of the ILO, UNESCO and the documents of the EU. The SPED however treats equality as a way of "ensuring equal access of all the participants to the educational process, and to the best educational resources and technologies"; it also suggests that improving the financing system aims to provide equal access to education services.

36 Participation in formal technical and vocational education and training programmes worldwide. An initial statistical study. UNESCO. UNEVOC. UNESCO Institute for Statistics. 2006; ILO Labordoc population database.

Free access to education and training is commonly interpreted as one of the instruments for ensuring equal opportunities for: a) personal development as well as b) entering the labour market (ILO, 2004). These efforts contribute to achieving the so-called "inclusive growth." Free publicly-funded access to TVE is not the only instrument for ensuring equal access. Other important equal access instruments include availability of training institutions and training places in the areas where learners live or work as well as the availability of adequate choice of TVE programmes taking into account the gender-related and age-related needs and other reasonable preferences of young people.

With regard to equal opportunity, the Law on Education provides for publicly funded general education, while the acquisition of vocational education (the skilled worker qualification) is available on the basis of competition and within the so-called "state order" for TVE services (Article 8). Any competition effectively reduces the basis for equal access and requires some compensatory schemes. Each government decides for itself on the minimum guarantees it can offer for ensuring equal opportunities to access TVE and the labour market. Besides offering free general education, developed countries also offer various levels of TVE free-of-charge. A minimum level of such a government guarantee for accessing TVE and, through this, the labour market, is a provision of vocational education/skill training leading to the skilled worker qualification enabling them to acquire a trade without competition, without other conditions and free of charge. However, the acquisition of the technician-level qualification may not necessarily be provided free of charge and will require passing an entry examination (UNESCO, 2011, Section 15. Tertiary Education. Clause 201) simply because of the course higher prerequisites and requirement.

The ILO HRD Recommendation 195 (2004) (ILO, 2004, Section 8) stated that "members should: (a) recognise their responsibility for education and pre-employment training and, in co-operation with the social partners, improve access for all to enhance employability and to facilitate social inclusion." Thus it can be concluded that the pre-employment training of workers (meaning skills training in the first trade/s) is the responsibility of governments and should preferably be publicly funded. In 2013, only 25.8% of the 237 911 TVE students after grade 11 of general schooling, were publicly funded, while 51.7% of the 349 399 students after grade 9 were publicly funded. Publicly funded TVE means that students are enroled on the basis of the so-called "state order." Overall in Kazakhstan, some 40% of TVE students are on publicly funded programmes while the remaining 60% must pay fees (NCESA, 2013).

The Republic of Kazakhstan, in which a significant share of youth aims to enrol at universities, would clearly benefit from providing free access by young people to the skilled worker training programmes (this provision may, in the future, be extended to the technician education programmes). This would improve the balance of educated graduates against the structure of the national labour force presented in Table 5. It may also be expected that enrolments of young people in the free-of-charge TVE programmes will increase as the youth who are currently staying out of vocational education and training, as well as any other education streams, may join TVE. This may particularly be relevant for the rural areas and small towns in which low-income families live.

The issue of equal opportunity in accessing TVE and labour market may need to be addressed more broadly taking into account: the large territory; obvious differences between the urban and rural populations in accessing TVE institutions; and the disparities in the funding levels between regions given that the funding of TVE is entirely decentralised. Such regional funding disparities are recognised and addressed through compensatory mechanisms in other countries such as the USA and France.

Quality of TVE

Concepts and policies for TVE quality assurance may vary across countries. However, planning of the quality-related activities need to be preceded by a national concept of TVE quality. In the SPED, a number of quality-assurance activities are listed aiming to improve institutional accreditation, staff training, development of standards, etc. which would benefit from bringing them under a certain systemic concept.

Efficiency of TVE systems and institutions

National TVE policies and reforms commonly aim to improve and monitor the efficiency of utilisation of TVE institutions' assets and resources in producing the outcomes. Such objectives may involve improvements of institutional management and organisational structures, funding schemes, monitoring and reporting, etc. Some of the activities are described in the SPED with the major focus being placed on the introduction of public-private partnerships in managing TVE system and institutions.

National TVE qualifications, standards and assessment

System of national qualifications

In the SPED (MES, 2010, p. 49) there is considerable focus on the development of national system of qualifications. The system of qualifications and its descriptors adopted in Kazakhstan in 2012 followed the dimensions and descriptors of the European Qualifications Framework. However, the adopted format of the outcome statements referred only to qualification levels rather than to the types of national qualifications leaving some important aspects unspecified. As a result, first, the national qualification system does not provide names of qualifications and their descriptions. Second, the qualifications system does not suggest the nominal duration of learning programmes corresponding to the achievement of different qualifications. Third, the project team's concern with the national concept is that the national qualification system should exist along with the industry sector qualification systems in which national qualification levels can be/will be split into various numbers of sub-levels depending on the industry sector's specificity.[37] During the interviews, the project team learned that in some trades and sectors there should be seven or more levels of skilled worker qualifications, which does not seem feasible. In other countries, usually there is only one national qualification system consisting of qualification types related to certain levels (being defined on the basis of descriptors). Several different qualifications can be placed at the same qualification level. In the labour market, importance should be placed on "the qualifications" themselves rather than on national qualification levels.

Perhaps as a result of the above-mentioned uncertainties, in the documents: "State compulsory standard for the technical and vocational education" and in the "State compulsory standard for the so-called "post-secondary education", some types of qualifications are mentioned, such as "junior engineer", "middle-level specialist", "middle-level specialist in the area of services and management"

37 The Concept of the National System of Qualifications. According to the Contract No. KZTVEM/CQS-01 from September 28 2012 "Development of the Concept of the National System of Qualifications, National and Industry frameworks of qualification" (the Program 074) within the project "Modernization of Technical and Vocational Education", Astana 2012

[38] which are not described in the proposed qualifications system. In the educational standard developed for the area "Electrical equipment"(MES, 2009) some other qualification levels are mentioned such as "the worker of higher level."

There is a wide-range of national qualification systems in the world from simple to very complex, such as the Scottish qualifications system. In any case, national qualification systems are expected to be useful instruments for describing the types of national qualifications, comparing levels of their complexity, identifying the duration/volume of study programmes leading to them, and showing the progression routes between qualifications to make them clear for users and educators. The Kazakhstani national qualification system needs to be complemented by a detailed description of the types of national qualifications enabling the recognition of their differences and the volume of learning required to achieve such qualifications. Industry sectors should be obligated to develop qualifications in strict conformity with the types of national qualifications.

For example, Table 7 provides simplified descriptions of outcomes of the Australian TVE qualifications. In Australia, the TVET qualifications are Certificates I-IV, Diploma and Advanced Diploma. Each qualification has its clear purpose and the associated volume of learning enabling to place the newly developed qualifications within the qualifications framework.

Table 7. Australian vocational education and training qualifications

Qualification type	Qualification level	Purpose of qualification	Volume of learning
Certificate I	Level 1	Certificate I qualifies individuals with basic functional knowledge and skills to undertake work, further learning and community involvement	The volume of learning of a Certificate I is typically 0.5-1 year
Certificate II	Level 2	Certificate II qualifies individuals to undertake mainly routine work	The volume of learning of a Certificate II is typically 0.5-1 year
Certificate III	Level 3	Certificate III qualifies individuals who apply a broad range of knowledge and skills in varied contexts to undertake skilled work	The volume of learning of a Certificate III is typically 1-2 years
Certificate IV	Level 4	Certificate IV qualifies individuals who apply broad range of specialised knowledge and skills in varied context to undertake skilled work	The volume of learning of a Certificate IV is typically 0.5-2 years
Diploma	Leve 5	The Diploma qualifies individuals who apply integrated technical and theoretical concepts in a broad range of contexts to undertake advanced skilled or paraprofessional work	The volume of learning of a Diploma is typically 1-2 years

38 On Approval of the state compulsory standards of education of the relevant levels of education. The Resolution of the Republic of Kazakhstan № 1080, August 23 2012: assignment of the level of qualification of secondary level – after the completion of the full course. Training and passing the final attestation by students; 3) assigning the level of qualification of the junior engineer – on completion of the full course of training of the higher technical school and taking the final attestation of students. "The qualification of a junior specialist of maintenance and managing labor".

Qualification type	Qualification level	Purpose of qualification	Volume of learning
Advanced Diploma	Level 6	The Advanced Diploma qualifies individuals who apply specialised knowledge in a range of contexts to undertake advanced skilled or paraprofessional work	The volume of learning of an Advanced Diploma is typically 1.5-2 years

Source: Australian Qualifications Framework. Second Edition. Australian Qualifications Framework Council. January 2013.

Occupational standards

It is rightly expected that industry sectors should actively participate in the development of occupational standards, which need to provide structured occupational requirements. Forms of such participation may be different. For the mass worker trades, which are found in many industry sectors, a national panel of experts may be appointed upon agreement with those industries. In any case, the developers of standards should be trained and the writing of standards should be supervised by professionals preferably from the TVE system. When occupational standards are to be developed by industry training bodies (like in the UK and elsewhere) they commonly need to recruit trained experts but not assign this work to ordinary engineers, technicians, or skilled workers. In the competency-based TVE systems, qualifications and the programmes of learning are based on certain standards of competent performance in the workplace. Occupational standards become the competency standards only if they are equipped with criteria of competent performance.

The EU-funded project attempted to develop what they call "The industry sector specific qualifications frameworks" with the aim to produce the broad-based qualification level descriptors.[39] These descriptors are not occupation and qualification specific and contain only very broad requirements for certain occupational families or areas of knowledge. The project team is unaware of any countries that develop such sector-specific qualifications frameworks comprising all the qualification levels. The format for an occupational standard drafted under the World Bank-funded project,[40] which was made available to the team, looks more suitable. However, the team did not obtain any completed occupational standards for any qualification.

Educational standards

The "State compulsory standard for the technical and vocational education"[41] determines the same requirements for both, the skilled worker qualification and the technician qualification. Some of the requirements of such standards (quoted below in the reference) do not seem to be applicable to the vocational education programmes leading to the skilled worker qualification. This makes it difficult

39 Based on: Professional standards: "Industry Qualification Framework for the specialties of agriculture industry". Agrotechservice . National code 1501000.

40 The model of the professional standards. The Ministry for Education and Science of the Republic of Kazakhstan,. World Bank. Astana. 2012

41 "The Content of the academic programs for technical and vocational education envisages learning of: 1) the integrated courses on comprehensive disciplines; 2) humanitarian, economic, general professional, special disciplines; 3) the integrated academic programs for technical and vocational education with academic programs for 1-2 Year students in Higher Education." "On Approval of the state compulsory standards of education for the relevant levels of education". The Resolution of the Government of the Republic of Kazakhstan, August 29, 2012.

for colleges that are unable to separate vocational education programmes leading to the skilled worker qualification from the technical education programmes leading to the technician qualification.

The list of educational standards,[42] with 86 listed overall, refers to the occupational areas such as, hairdressing and jewelry-making, or areas of learning, such as architecture. The educational standard for the occupation "Electrical equipment/Code 0901000" was examined (MES, 2009). This educational standard is specific enough and refers to the three related skilled worker occupations as well as to the technician qualification, "Electrician technician". These educational standards describe "generic competencies" as well as the so-called "professional competencies" and provide a little bit more detailed "special competencies" for each of the four occupations. The education standard is complemented by a frame curriculum, which determines the breakdown of the education programme per subject and the related forms of student progress assessment. The standard also determines the breakdown of theory and practical instruction. The examined educational standard is a solid basis for further perfection so as to improve the quality of occupational standards.

TVE programmes

An important issue is the inter-linkages between education programmes and related qualifications. It is of course justified that technician certificate holders if enroled in the relevant HE programmes, may reduce the duration of their study. UNESCO confirms the arrangement for graduates of technical education (Technical Education Certificate holders/ISCED Level 5) to have the right for credits to be counted in the HE programmes (ISCED Level 6) (UNESCO, 2011). However, TVE programmes in Kazakhstan are not credit-rated. It is therefore difficult to judge what should be the duration of Bachelor's programme for a person who earned a Technician Certificate. Perhaps, for different occupations, the residual duration of the Bachelor's programme for the Technician Certificate holders could be different. The specific arrangements can only be made through detailed comparisons of the TVE and the HE programmes.

For whatever reason, in the Education Act of the Republic of Kazakhstan (last amendment dated 24.10.2011/further, "Education Act") Technical and Vocational Education is listed as part of General Education. In the Education Act (Article 12: Levels of education), general education covers high secondary school, technical education, and vocational education. This provision differs from the structure adopted by the recently amended UNESCO classification of education (ISCED 2011), which clearly distinguishes between general education, vocational education, and technical education. High secondary general education and high secondary vocational education programmes are classified as ISCED Level 3; vocational education (post-secondary non-tertiary) refers to ISCED Level 4; and technical education is the first stage of tertiary education specifically at Level 5. The reading of the Education Act no longer corresponds to the national system of TVE qualifications adopted in 2012.

Programmes at ISCED Level 3, or "upper secondary" education, are typically designed to complete secondary education in preparation for tertiary education, or to provide skills relevant to employment, or both. ISCED level 3 programmes form the second/final stage of secondary education and may be either general or vocational. If the theoretical duration of a vocational ISCED Level 3 programme is two or more years longer than the theoretical duration of a general ISCED Level 3 programme in the same education system, the programme should be regarded as spanning upper secondary (ISCED

42 The Order of the Ministry for Education and Science of the Republic of Kazakhstan, No. 587 "On approval of the state education standards, standard academic programs for technical and professional education", December 30, 2010.

Level 3) and post-secondary non-tertiary (ISCED Level 4) or short-cycle tertiary (ISCED Level 5) (UNESCO, 2011).

"Post-secondary non-tertiary education (ISCED Level 4) is the one which provides learning experience building on completed secondary education and preparing for labour market entry as well as tertiary education. It aims at the individual acquisition of knowledge, skills and competencies below the high level of complexity characteristic of tertiary education. Given the complexity of their content, ISCED Level 4 programmes cannot be regarded as tertiary education programmes, although they are clearly post-secondary education (ISCED, 2011 p.39)." ISCED programmes at the Levels 3 and 4 refer to vocational education and may produce both, semi-skilled and skilled worker qualifications.

"Tertiary education builds on secondary education and includes academic education, but also includes advanced vocational or professional education. Short-cycle tertiary (ISCED Level 5) requires the successful completion of ISCED Level 3 programmes that gives direct access to first tertiary programmes. Access may also be possible from ISCED Level 4" (ISCED, 2011, p.42). ISCED Level 5 programmes refer to the technical education leading to the technician qualification. It is important to take note from the above quotations that the technical education programmes (ISCED Level 5) *do not require* completion of the Level 4 (skilled worker qualification). It only suggests that it is possible for the skilled workers (graduated from the ISCED Level 4) to continue education as technicians (in the programmes classified as ISCED Level 5).

Assessment and certification

The SPED aims to introduce a system of independent assessment and certification. It is proposed that the "independent centers of certification with the participation of employers should be functioning in the sectors of economy by 2020." The concept of independent centers is not described in the Programme in detail. However, if such centers are indeed going to be the organizations with their assets, it would be the most expensive option. Most countries use premises of existing enterprises that become accredited for conducting assessment. In certain cases, TVE institutions are also registered as the accredited testing sites. As far as the testing process is concerned, it should be conducted not by employers but rather by registered persons who are certified to conduct skills assessment as well as are certified workers in the trade in which the assessment will be conducted. For instance, in Australia any registered skills assessor should have a qualification called "Certificate Level 4 in Skills Training and Assessment."

The need for a national qualifications authority

It is indeed desirable, as proposed in the State Programme of Education Development, to institute a national qualifications authority in Kazakhstan (or a national quality assurance agency with a broader mandate) to co-ordinate the development of occupational standards and qualifications, register national qualifications, supervise issuing of awards, and focus on the quality assurance issues in education. A national qualifications authority should have balanced tri-partite governance making industry stakeholders and the educators the equal partners.

Governance, management, planning and funding of the TVE delivery

National level

Management responsibilities in TVE system are properly divided between the national government, which is mostly responsible for policy-making, legislation and national monitoring issues. The Department responsible for TVE within the MES is structured into four organisational units overseeing the following areas:

- content of TVE programmes;
- national order for the TVE services, procurement of TVE services remaining within the competence of the central government;
- development of TVE institutions;
- development of public-private partnerships in TVE.

Further thoughts may be given to the functions/titles of the units of the TVE Department taking into account the common fundamental responsibilities of the government such as: TVE policies, systems, legislation and regulations; a system of quality assurance, equal access to TVE and lifelong learning; strategic planning and anticipation of national demand and supply in conjunction with the national strategic development planning, etc. The TVE policy-making process could be improved if the national TVE Council provided guidance to the national TVE policy development and monitoring process.

National TVE Council

The SPED aims to change the management of the state-public system of education by introducing corporate governance principles and forming public-private partnerships in education. The recently established National TVE Council[43] is an advisory body chaired by the Prime Minister. Its main purpose is to provide support for the implementation of policy and co-ordination in labour force development. The Council is assigned responsibilities for developing recommendations on a broad range of technical issues such as a national system of qualifications, ensuring participation of employers in TVE; planning and anticipation of demand for skilled workforce, etc. In many other countries such a national council would be mostly involved in the development, co-ordination and monitoring of the national HRD or TVE policies and strategies.

TVE monitoring system

Improving TVE monitoring is an important objective of the SPED. A considerable volume of data is already being collected and published by the MES. However, it was not always evident to see how these data can be used for making TVE policy monitoring judgments.

Sound TVE monitoring systems usually include three groups of data:

- the data required for monitoring TVE policy implementation at the national level. Such data entries and the ways in which they are combined center around the national TVE and economic policy objectives;

43 The National Council on preparation of professional and technical specialists (consulting and authority), on creation of the National Council on training of professional technical specialists, The Resolution of the Government of the Republic of Kazakhstan from March 30, 2011 No. 298

- the data required for making operational decisions, which in conditions of decentralised TVE systems like in Kazakhstan, are collected at the regional level. Such data entries should involve information on the regional learning and employment needs of the population as well as the data on economic demand for an educated and skilled workforce; some other data involve the annual occupational structures of TVE enrolments and graduations; there should be comparative data on equal access to TVE as well as the funding levels for TVE, etc.
- the data required for participation in international TVE comparisons along the formats required by UNESCO, etc.

The currently existing data may be reviewed bearing in mind the above considerations and combined in a way in which the proposed objectives could be met.

Industry Councils

Fourteen sector-based TVE Councils were established with the major purpose of improving the governance of labour force development by economic sector. The employers' associations in tourism, oil and gas, and metallurgy sectors are the most active in this area. The key role of the sector TVE councils is to advise on sector-specific elements of qualifications systems and the related occupational standards. Councils in Kazakhstan are set-up by ministries rather than being voluntary bodies, and involve employers' and unions' representatives. Their secretariats are ministerial departments. Such councils do not have budgets and use the time and expertise of company professionals and their HRD staff to contribute to the activities. Some councils have quite an extensive membership in excess of 30 senior administrators, professionals and researchers. Being tri-partite, such councils may have the advantage over the purely company-based councils. However, their objectives and expectations should be clear and operational procedures should be sound. Given that many of the same occupations and related qualifications such as welders, electricians, clerks, etc., are employed by different economic sectors, proper consultations are required between sector councils to agree who will be the lead bodies in the development of occupational standards. If sector-wise strategic labour force planning is a function of such councils, the persons involved should be trained in doing so.

Regional level

Regional TVE Departments

Most of the public TVE institutions, except for the few subordinated to the national government, are supervised and financed from the regional (Oblast) level budgets. The departments of education, which report to the regional Akimats, are the prime authorities for them. TVE regional departments are staffed with two to four persons and are responsible for operating several dozens of public TVE institutions. For instance, in Almaty, the TVE Department has a staff of three who are responsible for almost a 100 colleges. The principle functions involve college licensing, director appointments, planning of TVE enrolments, which are funded from the regional budget, negotiation of college budgets, and monitoring delivery. Given the large number of public and private colleges and the broad scope of educational reform, the regional TVE departments seem under-staffed. There is a need to have staff with the knowledge of equal access to TVE, understanding of the current and future regional demand for educated and skilled workforce, capable of working with other departments and the statistical office to make a case for developing and modernising the regional TVE systems.

Regional TVE Councils

Sixteen regional councils have been set-up recently in order to develop TVE and labour market training.[44] The councils involve representatives from: the regional employment service, the employer's confederation, chair of association of college directors, etc. Councils are in fact very well placed since regional governments are responsible for TVE delivery planning and funding. Councils are also expected to deal with the unemployed. However, councils currently operate as a discussion hub and in their current capacity may not be able to significantly impact on the effectiveness of regional TVE delivery. What is reasonably expected from regional councils is their collective knowledge of the regional demand and supply issues coming from the population and from the economy. However, the regional councils do not have operational concepts, procedures and budgets to assess demand for education and training and to improve the matching of supply with demand so as to advise regional authorities. Councils should also be concerned with improving equal opportunity to access TVE and employment in their regions. Councils involve busy people who themselves cannot devote significant time to these types of issues. Therefore, councils should be able to commission local research organisations to collect and interpret data to help guide their recommendations.

TVE institutions

Legal and funding regime

TVE colleges are registered legally as "communal public enterprises"[45] providing them with considerable operational and financial autonomy. Directors of TVE colleges are appointed by the regional Akims rather than by the MES. Directors of TVE colleges employ their own staff. Colleges receive public funding from regional authorities within the negotiated agreements and are free to generate revenue by offering TVE services to the market. They cannot however generate revenue by renting their premises and from selling products other than TVE services. Efforts are being made by the TVE Ministerial Department to further increase the degree of operational flexibility of colleges by allowing the movement of funds between budget lines, if need be. The project team paid significant attention to the intention of introducing performance-based funding schemes in Kazakhstan. However, no national concept of the performance-based budgeting and funding was identified. It is expected that such a funding mechanism will be developed by the WB loan-financed project. [46]

Although structural reform is underway in TVE, which has resulted in numbers of vocational lyceums being converted into colleges, a provision of programmes in some of the converted institutions remains as it was prior to transformation. Some 311 colleges, formerly vocational lyceums, continue to offer only the skilled worker programmes, while the remaining 577 colleges, formerly vocational schools technicum, mostly deliver technicians. In some of these colleges, a popular concept is that technicians should be able to work as skilled workers. For the reason of operational flexibility it is important that each college, no matter its past, should be able to offer two levels of TVE programmes with one leading to the skilled worker qualifications and another one resulting in the technician qualification so as to satisfy the different education and employment aspirations of learners.

44 Methodological recommendations on organization of regional councils on development of technical and professional education and training specialists

45 "Utility state enterprises". The Law of the Republic of Kazakhstan "On the state property" from March 1, 2011, № 413-IV (with amendments and supplements as to 29.01.2013.)

46 A pilot project on implementation of per capita financing with approval of cost standards was to be implemented in 2011-2013. However no report of this exercise was available.

Colleges' Advisory Boards

The SPED promoted the introduction of advisory boards in educational institutions. The guidance provided by the MES on such boards[47] view them as purely advisory bodies that offer support to an educational organisation in implementing its mandate. The Programme target includes setting-up such boards in 45% of providers by 2015 and 60% by 2020. The concept of such boards is not yet clear. If boards are purely advisory to the TVE institutions' directors, who are appointed by regional governors, there is no need to change the national Law on Education. Members of advisory boards who involve employers, parents, etc. may advise college directors on various issues but they cannot guide or control their decisions.

Viewing such Advisory bodies as the institutional governing bodies would result in a complete turnaround in the TVE management system. Such a reform would require considerable change in the Law on Education as well in the law that provides for TVE institutions to register as "communal public enterprises." Only in this case would it be possible to consider the introduction of the "corporate culture" in TVE management as the objective of the State Programme of Education Development.

The "state order"-based planning and funding of TVE

Colleges report to regional governments and regional governments provide funding to colleges. Planning of the publicly funded enrolments in colleges is based on the so-called "state order." A basis for negotiating the state order is agreements concluded between colleges, on the one hand, and companies, on the other hand. These agreements involve commitments made by companies to accept a certain number of students for on-the-job instruction. Such agreements are commonly viewed as a proxy for the demand of regional economy for occupations and qualifications resulting in expected higher employability of graduates.[48]

However, there are many reasons to believe that college-company agreements are a rather weak basis for the planning of TVE enrolments. There is no evidence that:

- such college-company agreements are representative of the regional economy and the variety of occupations; it is most likely that many companies, particularly smaller companies, do not sign any agreements with colleges;
- companies will actually employ students taken on for on-the-job instruction when they graduate from colleges since companies have made no commitment to do so;
- such agreements are able to take account of the availability of skilled workers in the labour market who are seeking jobs including the unemployed skilled workers.

Equally important is the fact that planning of the publicly funded TVE based on the college-company agreements tends to completely ignore the learning and employment needs of young people willing to acquire an occupation/qualification according to their own career plans.

Some other concept for negotiating the state order is proposed in the East Kazakhstan region where a structure of the state order involves two flows: the base demand and additional demand. The base

47 The Order of the Republic of Kazakhstan "On approval of the Standard rules of the activities of the Board of trustees and the order of its election", No. 501 from October 22, 2007

48 "Demand and employment of graduates" is one of the main factors of placing state order. "The Rules of placing the state education order on preschool education and training the specialists with technical and professional, higher and postgraduate education, as well as Foundation courses in Higher Education Institutions". The Order of the Acting Minister for Education and Science of the Republic of Kazakhstan No. 198. May 4, 2012

demand is linked to the employment rates of graduates,[49] which is taken as a proxy for the current demand of the economy for graduates. The additional flow of demand is calculated on the basis of economic development plans of corresponding regions as well as the poverty alleviation programmes. In the less economically developed regions where industry demand for graduates is less, the base component may account for 20% of the total publicly funded order, while the rest is the additional component. This logic is proposed for skilled worker qualifications. For higher level qualifications, it is proposed to maintain the base component at 80% levels, while the additional demand is seen as 20%.[50] Around 35% of TVE enrolments are legally reserved for the rural population, people with disabilities and other disadvantaged groups.[51] Although more details of this approach is required in order to make any judgment, this approach shows a more balanced view of the needs both, of the economy and the population.

The project team, however, observed primarily the application of the former approach based on bilateral agreements between colleges and companies. The same logic for planning and funding of the state order was presented to the team at the meetings with regional councils. The regional TVE authorities need a certain concept as well as procedures to identify the regional learning needs of young people as well as the needs of the economy in order to support regional development and economic growth while monitoring the risk of mismatch.

Funding of TVE

The national budget includes disbursements aimed at the implementation of specific national policies and events as well as at bringing about significant changes in the TVE system. The total national public budgetary expenditure on TVE, which includes the regional budgetary funding of TVE of KZT 73.7 billion, has been rapidly increasing in recent years reaching KZT 91.1 billion in 2013. Between 2010 and 2012, national public budgetary allocation increased 72% enabling the transformation of TVE lyceums into colleges, improve TVE teacher training, continue development of learning resources, implement student testing and certification, carry out national professional contests, etc. The national budget also includes allocations for the construction of new TVE institutions, as well as funding for the 15 national TVE institutions, which continue to report to the MES as well as to other government bodies. Since large national institutions such as the Republican Center for the development of TVE and for awarding qualifications as well as the "Kasipkor" Holding report to the MES, their budgets are included in the national government TVE budget. For instance, in 2013, an increase of the national funding support of KZT 12.9 billion will cover the cost of student stipends, roughly KZT 8.67 billion, covering 60 549 students; and the student transportation support, roughly KZT 0.58 billion, covering 105 014 students. The improvement of college assets will be financed by the national budgetary allocation of KZT 2.4 billion.[52]

49 It is not known if employment rates of graduates are calculated on the basis of total employment or employment in the trades in which graduates had been vocationally educated.

50 Regulations on the order of formation and execution of the state order of the Eastern Kazakhstan region for training specialists with technical and professional education (the methodology of allocating the state order)

51 The Resolution of the Republic of Kazakhstan No 264 from February 28, 2012 "On approval of the quota size while entering educational organizations, which implement the professional academic programs for technical and professional, higher education", Astana.

52 The Law on "The Republican Budget for 2013-2015", the Ministry for Education and Science of the Republic of Kazakhstan

Nevertheless, the funding of public TVE delivery is the responsibility of regional governments, which are expected to provide recurrent budgets and capital funding for the 484 public TVE colleges located in their regions. Public colleges have two major sources of funding: i) regional budgetary allocations and ii) the student fee-based income. For instance, some 122 650 students in the public colleges pay fees at an average annual rate of KZT 120,000 thereby generating KZT 14.7 billion. Table 9 presents a breakdown of the regional budgetary allocations of KZT 73.7 billion and the student fee-based funding of KZT 45.1 billion of all the public and private institutions in the regions. The overall annual national expenditure on TVE, public expenditure of KZT 91.1 billion plus the student fee-based funding of KZT 45.1 billion, reached KZT 136.2 billion.

Table 8 compares regional TVE enrolments for the 14-24 age group, which is the major potential beneficiary from technical and vocational education. Participation rates of the youth aged 14-24 in TVE, which ranges between 9.4% (Almaty Oblast) and some 20% (Karaganda Oblast), surely reflects the differences in the availability of enrolment opportunities in the public and private TVE providers as well as the differences in the student ability to privately finance their technical education. The data show that, on average, a larger share of youth (54.8%) has to finance its technical education privately. In some regions, a share of the fee-financed TVE students aged 14-24 exceeds 65%.

Table 8 and Table 9 show considerable disparities between regions in the budgetary funding of TVE which are apparent in:

- the TVE participation rates of the 14-24 age group (ranging between 9.4% and 21.8%);
- the share of TVE students aged 14-24 funded from regional budgets (ranging between 32.7% and 70.8%);
- the average funding rates of the full-time student-year applicable in the budgetary funding by regional governments (ranging between KZT 164 000 and KZT 442 000);
- the average fee rates applied in the regions which seem to reflect the different ability of students to finance their technical education (ranging between KZT 80 000 and KZT 280 000).

The principle of the state order-based budgetary funding (as discussed elsewhere in this chapter) is questionable as there is no established procedure for identifying the so-called "state order" which is said to be linked to labour market demand for TVE graduates. This principle ignores the learning interests of the majority of youth and adults. The "state order"-based demand seems to be purely determined by the funding available in the regions.

Given the enormous differences of funding rates applied by both the regional governments and the private providers, the issue of TVE quality delivered by the under-funded colleges needs to be urgently addressed. The government intends to develop national funding rates, which will reflect fairly the cost of delivering quality programmes. However, the demand to apply the higher funding rates in regions will push down the volume of the state order (the budgetary-funded TVE students). Kazakhstan needs to develop a funding policy (budgetary as well as the student fee-based) and a funding mechanism that would help the regions with low budgetary income to finance TVE.

The labour market outcome of TVE

In order to adequately describe the effectiveness of the TVE delivery, some countries use the employment rates of TVE graduates after 6 to 12 months of their being in the labour market. Some other countries examine whether the graduates found employment in the occupations in which they had been trained and whether TVE graduates continue their education in the related subject area of higher education. A more elaborate approach aims to identify to what extent the acquired knowledge

and skills are relevant to graduates' job in the labour market although graduates work in a different occupation. Some further techniques involve assessing graduates' satisfaction with the received education and training after their experience in the labour market for one year or so. Employers in industries that are known for employing TVE graduates may also be routinely surveyed to identify opinions on the relevance and quality of graduates. In the future, the national TVE system in Kazakhstan may develop a data set and relevant data collection instruments to assess the effectiveness of technical and vocational education.

The current data collected by the labour force surveys allow for making general judgments on the extent to which the TVE graduates find jobs relevant to their education level. Table 10 shows that in the labour force of Kazakhstan, overall 20.4% of jobs require HE (managerial and professional jobs) while more than 33% of the economically active population are HEI graduates or persons with incomplete HE. Therefore, the number of HEI graduates and people with incomplete HE is 1.7 times greater than the number of relevant level jobs. The number of graduate technicians in the economically active labour force exceeds the number of available technician-level jobs by more than three times. As far as the skilled worker jobs in the labour market are concerned, only 17% of the labour force has acquired a skilled worker qualification either through vocational education or skills training. It means that more than 80% of skilled worker jobs are carried out either by graduate technicians or HE graduates or by people who graduated from general education and have never been vocationally trained.

Table 8. Participation of youth aged 14-24 in TVE in regions of Kazakhstan, 2012

		Participation in TVE			Students aged 14-24 funded by regional budgets under the state order		Students aged 14-24 funded by fees	
	Regions	Number of youth aged 14-24 in a region	Total number of TVE students aged 14-24	Youth 14-24 participation in TVE (%)	Publicly-funded TVE students aged 14-24	Publicly-funded TVE students as a share of all students (%)	Students enroled in fee-paying programmes	Privately-funded TVE students as a share of all students (%)
		1	2	3=2:1	4	5=4:2	6	7=6:2
1	Aqmola	129 477	23 222	17.9	13 354	57.5	9 868	42.5
2	Aqtobe	169 814	32 402	19.1	12 831	39.6	19 571	60.4
3	Almaty	359 867	33 920	9.4	15 687	46.2	18 233	53.8
4	Atyrau	109 510	17 506	16	8 441	48.2	9 065	51.8
5	East-Kazakhstan	244 025	38 352	15.7	17 838	46.5	20 514	53.5
6	Zhambyl	205 428	31 804	15.5	12 966	40.8	18 838	59.2
7	West-Kazakhstan	117 738	22 929	19.5	11 833	51.6	11 096	48.4
8	Karaganda	243 306	48 490	19.9	22 847	47.1	25 643	52.9
9	Kostanay	145 888	23 305	16	16 496	70.8	6 809	29.2
10	Kzyl-Orda	157 684	26 421	16.8	11 438	43.3	14 983	56.7
11	Mangystau	109 945	23 365	21.3	10 697	33.1	12 668	66.9
12	Pavlodar	128 267	23 673	18.5	14 170	59.9	9 503	40.1
13	North-Kazakhstan	92 827	14 191	15.3	9 277	65.4	4 914	34.6
14	South Kazakhstan	556 773	72 055	12.9	27 840	38.6	44 215	61.4
15	Almaty city	306 163	66 865	21.8	21 874	32.7	44 991	67.3
16	Astana city	148 387	29 189	19.7	10 749	36.8	18 440	63.2
	Total	3 225 099		17.2	238 338	45.2	289 351	54.8

Source: MES of Republic of Kazakhstan

Table 9. Sources of TVE regional funding in Kazakhstan, 2012

		Regional budgetary funding of TVE under the state order					Student fee-based funding			Total regional funding	
	Regions	Total number of TVE students	Number of students funded by regional budgets	Share of students funded from regional budgets (%)	Average rate of the full-time student-year budgetary funding (KZT 000)	Regional budgetary funding (KZT 000)	Students enroled in fee-paying programmes	Average annual fee rates (KZT 000)	Fee-based funding of TVE (KZT 000)	Total budgetary and fee-based funding (KZT 000)	Share of budgetary funding in total TVE funding (%)
		1	2	3=2:1	4	5	6	7	8	9	10=5:9
1	Aqmola	25,899	13,354	51.6	409	5,461,786	12,545	82	1,028,690	6,490,476	84.2
2	Aqtobe	37,643	15,687	41.7	328	5,145,336	21,956	140	3,073,840	8,219,176	62.6
3	Almaty	38,286	12,831	33.5	284	3,644,004	25,455	100	2,545,500	6,189,504	58.9
4	Atyrau	19,210	8,441	43.9	194.1	1,638,398	10,769	95	1,023,055	2,661,453	61.6
5	East-Kazakhstan	43,319	17,838	41.2	442.3	7,889,747	25,481	120	3,057,720	10,947,467	72.1
6	Zhambyl	35,472	12,966	36.6	303	3,928,698	22,506	83	1,867,998	5,796,696	67.8
7	West-Kazakhstan	26,319	11,883	45	280.2	3,329,617	14,436	80.2	1,157,767	4,487,384	74.2
8	Karaganda	55,100	22,847	41.5	286.7	6,550,235	32,253	110	3,547,830	10,098,065	64.9
9	Kostanay	26,223	11,438	43.6	164	1,875,832	14,785	112	1,655,920	3,531,752	53.1
10	Kzyl-Orda	29,485	16,496	55.9	348	5,740,608	12,989	130	1,688,570	7,429,178	77.3
11	Mangystau	27,092	10,697	39.5	200.9	2,149,027	16,395	100	1,639,500	3,788,527	56.7
12	Pavlodar	28,122	14,170	50.4	276	4,377,113	13,952	122	1,702,144	6,079,257	72
13	North-Kazakhstan	16,171	9,277	57.4	308.9	2,865,665	6,894	120	827,280	3,692,945	77.6
14	South Kazakhstan	75,645	27,840	36.8	301	8,379,840	47,805	97	4,637,085	13,016,925	64.4
15	Almaty city	66,690	21,874	32.8	332	7,262,168	44,816	280	12,548,480	19,810,648	36.7
16	Astana city	30,729	10,749	35	319.7	3,436,455	19,980	155	3,096,900	6,533,355	52.6
	Total	581,405	238,388	42.9	298.6	73,674,529	343,017	120.4	45,098,279	118,772,808	62

Table 10. Occupational and educational structures of the economically active population, Kazakhstan. 2012

	Job segments in the labour market	Occupational structure of the economy	Educational structure of the economically active population	Judgments
1	Jobs requiring HE	Overall-1 731 582 (430 230 of managers plus 1 301 352 of professionals)	Overall–2 926 331 (2 647 139 of HE graduates plus 279 192 of employees with incomplete HE)	The number of HEI graduates and people with incomplete HE is 1.7 higher than the share of relevant level jobs in the economy
2	Jobs requiring technical education	912 685 of technicians	2 840 233 of graduate technicians	The number of graduate technicians exceeds the number of technician-level jobs by 3.1 times
3	Skilled jobs requiring vocational education, vocational training or completed general education	Overall–3 970,849 of skilled workers in all occupational groups	Overall-3 018 369 (680,951 of technical and vocational education and training graduates plus 2 337 418 of graduates of general education schools)	The number of technical and vocational graduates accounts for only 17% of all the skilled worker jobs in the economy. More than 80% of jobs are carried out by general education graduates, HE graduates or technical education graduates
4	Unskilled jobs which do not require identifiable educational and training qualifications	2 078 064 of unskilled workers	Any general education level	Jobs may be carried out by general education graduates, HE and TVE graduates as well as by low-educated population groups

Source: Labour force survey of Kazakhstan. 2012; The main indicators of the labor market of the Republic of Kazakhstan, 2012

Quality of TVE

The national definition of the education quality drawn from Article 14 of the Law on Education suggests that quality is "a measure of compliance of education processes with the national standards of education, needs of personal and social development."[53] This definition suggests that education quality is as good as the national standards of education; this raises the need for a documented procedure to assure quality of the national standards of education as well as to assess the needs stated in this definition.

Perhaps it makes sense to compare the above definition with other opinions such as: "Quality assurance involves processes to ensure that qualifications, assessment and programme delivery meet certain standards." (Tuk, 2007). This definition has a broader scope of "quality" and the assessment thereof.

Quality assessment versus quality assurance

In the SPED of Kazakhstan, there are many activities directly or indirectly related to the quality of TVE delivery. However, these activities are not included in the Programme in a systematic way. Observers may combine various proposed activities in different ways depending on their own understanding of what TVE quality is and how it should be achieved and monitored. The SPED (MES, 2010a, p.8) states that "The National System of Education Quality Assessment has been established in the country and is being implemented in all regions" placing the focus on the *quality assessment* rather than on the "quality assurance" while the latter is the focus in many other countries.

Attestation of TVE providers

TVE institutions are, by the Law on Education (LERK, 2007, Article 17), also subject to the attestation, which aims to control the compliance of educational services with the national standards of education. Attestation of TVE providers and of their delivery of education programmes is due every 5 years and has implications for the validity of providers' licences.[54] The rules governing the attestation determine the key focus on selected inputs such as the TVE providers' staff, students, labs, etc. Suggested methods of data collection involve interviews, analysis of the intermediate results of learning, observing lessons, etc. The quality of learning is to be assessed through sample testing of students' knowledge and understanding. If at least 70% of students pass the assessment, the results of the tests along with other assessments are interpreted so that the TVE provider's compliance with the national education standards is satisfactory. Attestation is implemented by the regional government administration responsible for TVE.

Attestation of educational institutions was presented to the project team as the monitoring of TVE as one of the major functions of the National Committee of Education and Science, which reports to the MES. A meeting held with its regional arm, the Regional Committee, Almaty provided evidence that this structure, at the regional level, is primarily engaged in regular compulsory "attestation" of both public and private colleges. Every college is subject to the attestation, apart from one-off "licencing", which takes place every 5 years and is preceded by a college self-evaluation. Attestation

53 "national system for quality assessment - aggregation of institutional structures, procedures, forms and means of ensuring the *alignment of the quality of education to state compulsory standards of education, needs of the person, community and the state"* (LERK , 2007, Article 14)

54 The instruction on organization and conducting the state attestation of educational organizations. Approved by the Order of the Acting Minister for Education and Science of the Republic of Kazakhstan from March 5, 2008 №109

of colleges is implemented by a team of professionals from the regional TVE community who have considerable experience in TVE. No standard description of the attestation process was identified and may require further attention. The issue of the TVE broader quality assurance was viewed by the staff of Regional Committee as one of the areas on which to focus for their future development

It seems that the attestation of institutions is to assure their good management, operational, and financial performance and, for instance, in the UK, is commonly the purpose of inspections. For this, the UK has two independent public inspectorates that employ several hundred full-time and part-time inspectors. If the TVE institutions' attestation in Kazakhstan is to make an important impact, the attestation processes need to be designed and standardised across regions. The team members participating in the attestation processes should be trained and registered to become qualified for carrying out such an attestation. It would be good practice for trained "inspectors" from one region to participate in the attestation in other region than their own.

Process of institutional accreditation

The Law on Education determines the need for institutional accreditation (Article 16) as a procedure of "recognition of compliance of educational services with standards of accreditation with the purpose of acquiring verifiable information on the quality and collecting evidence of availability of mechanisms for improvement."[55] Some other definitions suggest that "The accreditation of institutions is the process of recognising that education and training institutions meet appropriate standards of quality."(Tuk, 2007) To compare both definitions, it seems that it is important to agree on the standards of quality. The procedures for institutional accreditation should aim to identify a measure of institutional compliance with such quality standards.

Prior to the launch of the National Vocational Education Development Programme (2008–2012) colleges had not been covered by accreditation procedures. The SPED (2011-2020) aims to get 10% of public colleges (49 institutions) accredited until 2015. In 2013, some 20 colleges are to be accredited. The accreditation procedures are still under discussion.[56]

In 2012, it was decided to initiate accreditation of educational institutions through the *competitive processes*. A national register of the accreditation bodies was established by the MES, which allows both national and foreign agencies to be registered. Schedule 1, intended for registering the accreditation agencies, now has six agencies listed with two of them being national and four being international.[57] The national rules of the educational institutions' accreditation[58] require that accreditation bodies:

55 "accreditation of educational organizations – the procedure of recognition by the accreditation body the alignment of academic programs to the established accreditation standards with the aim of providing the valid information on their quality and confirming the availability of the effective mechanisms for tis enhancing" (LERK, 2007, Article 16);

56 Based on: Information Note: Memo on accreditation of Universities and TVE organizations in Kazakhstan.

57 The order and the requirements on conducting the National Registry of accreditation authorities, accredited authorities of education and academic programs. Approved by the Order of the Minister for Education and Science of the Republic of Kazakhstan from December 30, 2011 No. 556

58 On approval of the Rules of accreditation of educational organizations. The Resolution of the Government of the Republic of Kazakhstan, Astana, the Government House from December 29, 2007, No. 1385

- implement the "institutional accreditation" and the "accreditation of educational programmes;" and[59]
- develop their own standards and criteria for both above areas of accreditation.

Introducing competition in the area of quality control in education may be of a concern. It is assumed that each independent accreditation agency's standards and criteria should be aligned with the laws as well as the requirements of the Committee on Technical Regulation. If the committee's requirements are very strict, then the differences between the accreditation standards developed by different accreditation agencies will be negligible. If the committee's requirements are less strict, then there will be a market for accreditation standards. TVE providers will most likely be looking for the weakest accreditation standards.

Standardisation of accreditation requirements is important to ensure quality and comparability of the accreditation instruments, processes and results, which would allow quality benchmarking across regional and national colleges. Few countries, one being the UK, are known for having several qualifications awarding bodies which use their own accreditation processes for TVE for providers which deliver the learning programmes and qualifications that have been developed by such qualifications awarding bodies. In the UK many agencies compete to develop their own learning programmes, running the related assessment processes and issuing related awards. In the UK this has resulted in the availability of dozens of thousands of qualifications that are said to be sometimes difficult to understand and select.

However, as long as the learning programmes are national and no other agencies develop and market their own qualifications, there is no need for different accreditation standards and processes.

A recently established Independent Kazakhstan Agency for Education Quality Assurance[60] also aims to conduct accreditation of all the educational institutions including TVE colleges. For TVE institutions such an independent accreditation is voluntary. The processes would involve self-assessment as well as the external assessment.

National Center for the Development of TVE and for awarding qualifications

The fundamental technical role in assuring quality of TVE is to be assigned to the National Center for the development of TVE and for awarding qualifications.[61] This body is responsible for developing standards of all kinds as well as of student tests and for administering tests in TVE providers and further, at the workplace.

In general, the national quality system in Kazakhstan does not seem sufficiently conceptualised and integrated. The lack of a clearly defined concept and, more importantly, a scope of quality and of the related processes for quality assurance has led instead to the prevalence of quality assessment. The proposed accreditation and attestation activities of TVE providers in Kazakhstan should be clearly defined and integrated within the concept of assuring the quality of TVE. The procedures of accreditation and attestation should be well structured, standardised, and quality-assured.

59 "Accreditation is carried out as institutional and specialized". Accreditation of educational organizations is implemented on the basis of assessment of the activities of educational organizations on alignment of standards and criteria, developed by the accreditation body. "About approval of the Rules on accreditation of educational organizations"

60 *http://nkaoko.kz/accreditation_of _colleges/*

61 The Republican research-methodological center for development of TVE and assigning qualifications (RRMC). *http://www.rnmc.kz/*

Public-private partnership and a planned introduction of the dual system

The SPED plans to ensure employer involvement in TVE through the introduction of the so-called "dual system" (co-operative education/ training), employer participation in the development of education programmes, qualifications and standards of all kinds, participation on TVE institutions' boards, training of TVE staff, setting-up regional and sector councils, etc. It is expected that the so-called "co-operative learning will be widely implemented by 2020." Industries are expected to take the lead in the development of competency (or occupational) standards and industry-specific qualifications. Industries may also be required to assess their short-term future training and employment needs as well as the quality of education graduates so as to provide feedback to the government and TVE sector. The latter activity in many industrialised countries will be financed by government grants.

The intended introduction of the dual system is a rather radical innovation that will test the interests of trainees, employers as well as the availability of various conditions. Major factors that need to be addressed in introducing the "dual system" are:

- Formal apprenticeship systems applied in several advanced countries (Germany, Austria, Switzerland, etc.) are based on the training of skilled workers through a slow process involving several years (3-4 years) of full-time work combined with on-the-job instruction as well as with some general type of school education. By contrast, in Kazakhstan, skilled workers are trained for 1-3 years depending on the achieved level of general education. With the introduction of the dual system, graduates who joined TVE after grade 11 should agree to remain in training 2-3 times longer, which may not be attractive. Therefore the dual training may only be a viable option for those who dropped out of general schooling after grade 9. Again, if grade 9 dropouts enter the dual system training, a sufficient time should be provided for them off-the-job to continue general school education.
- Formal apprenticeship systems commonly offer dead end training meaning that their graduates would have difficulty in entering HE if they so choose because their learning was entirely based on practical mastering of jobs. This perspective is new for youth in Kazakhstan and may not be well received.
- Large-scale introduction of the dual system for the development of skilled workers assumes that at least 100 000 - 200 000 trainees of the current 590 000 trainees should be placed as trainees, almost full-time, in relatively large industrial and services enterprises. Given the structure of the local economy, of which almost a quarter of the labour force is employed in agriculture, services and retail trade establishments, it seems that the on-the-job placing capacity of national industry may be too small to accommodate so many trainees.
- Companies may not be interested in accepting massive numbers of on-the-job trainees because the difference between market wages of skilled workers (who may be readily available in the market) and the company cost of apprenticeship training would be small providing no incentives for accepting apprentices. For this reason, companies may prefer to employ adult workers with experience from the labour market and retrain them if need be.

Training enterprises should also be prepared to implement such regulated training by rotating trainees through sets of inter-linked jobs according to the nationally approved curriculum/training plans resulting in acquiring a complete skilled worker qualification, etc. To maintain compliance with the regulated training (curriculum), a certain control is commonly required in companies to avoid trainees' exploitation. This reason that companies may prefer to employ already experienced adult workers and retrain them if need be.

TVE staff development

In the SPED (MES, 2010, p.19), training and upgrading of teaching staff is top priority aiming to enhance the prestige of the teaching profession and improve the quality of TVE. Subject teachers and vocational instructors upgrade their qualifications through internships in enterprises.

It is important to recognise the need to establish regulations for practical instructors. So far, skilled workers from industry can be employed as instructors by TVE institutions without any pedagogical training. However, having pedagogical knowledge is an important requirement in many countries, including Germany, where skilled workers in companies cannot train apprentices unless they undertake some training. Doing welding work and training young people in welding are different things. Those who are supposed to train others, particularly the youth, should comply with some competency standards in teaching/training. All of those employed as a teacher and instructor should be trained and certified for doing so.

The SPED also recognises that training in vocational education management is essential. A visit to the Republican Institute for Development of Leading and Research-Pedagogical Staff of Education System of the Republic of Kazakhstan helped clarify that the currently available education management upgrading programme consists of one week of lecturing complemented by one week of practical instruction based on the interests of current learners. Given the broad-based reform of vocational education and training policies and systems taking place in Kazakhstan, resulting in the enhanced operational and financial autonomy of TVE providers, it may be advisable to develop a structured management course. Learning programmes in TVE management at the Certificate and Diploma levels were developed in Australia. In some other countries for instance, in the USA there is a qualification in education management.

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CHAPTER 3

Higher Education and Research

This chapter sets out the priorities for higher education and research in Kazakhstan in order to improve its performance and quality to globally competitive levels.

Introduction

This chapter examines the need to improve the performance and outcomes of higher education and research in order for Kazakhstan to meet individual and social needs and to be globally competitive. It sets out some key priorities including the requirement to improve labour market relevance, build system capacity, increase funding levels and develop a more equitable financing framework.

Significant progress

Over the past decade, Kazakhstan has taken significant steps to improve the competitiveness of its system of higher and post-secondary education and research. Many of these actions reflect the recommendations of the 2007 OECD/World Bank review of higher education (OECD and WB, 2007). The following discussion of priorities notes many of these policy initiatives. Multiple international and domestic expert groups have documented the major issues facing Kazakhstan's higher education system. The nation's leaders have enacted new laws and issued decrees in an effort to spur reform. The SPED 2011-2020 includes several projects and initiatives that, if implemented, could move the country closer to its goal of global competitiveness.

Context of 2030 and beyond to 2050

Even with this progress, Kazakhstan faces a major challenge in reaching the President's 2050 vision. The most recent World Economic Forum Global Competitiveness Index (2012-13) ranked Kazakhstan at 51 out of 144 countries, an improvement from the ranking of 72 in the previous two years. However, the chapter indicates that an "inadequately educated workforce" was the most cited "problematic factor for doing business" followed closely by "corruption." (WEF, 2012, pp. 216-7).

Concerns about the workforce have risen sharply from 7th in the 2009 Global Competitiveness Index to a level of 1st or 2nd place (alternating with corruption) over the past three years. Out of 144 countries, Kazakhstan's overall ranking for higher education and training was 58th, rather worse than its overall ranking 51st, and its rankings of indicators of educational quality were considerably worse – 101st for the "quality of the educational system", 81st for the "quality of math and science education", and 103rd for the "quality of management and business schools." Rankings of innovative capacity (92nd) and the quality of scientific research institutions (108th) were also low. None of these rankings has improved significantly over the past three years.

Another important indicator of a country's global competitiveness is the percentage of the population ages 25-64 that has attained tertiary education, especially the younger age group of ages 25-34 (see Appendix N). Overall, Kazakhstan appears to be within reach of the OECD average. What is striking, however, is that a significantly smaller percentage of the younger age group in Kazakhstan has a tertiary-level education. This contrasts sharply with the steady improvements in educational attainment generation-to-generation in many of the comparator countries. This difference and other

issues will be discussed later in this chapter[6263]. In addition, many of the comparator countries have established clear educational attainment goals for higher education, in order to monitor progress and as a way to hold governments accountable for results (see Appendix P).

A recent World Bank report, "Kazakhstan: On the Crest of an Oil Wave", noted that Kazakhstan should benefit significantly from revenues generated from increased oil production for at least the next 25 years or more and that, "If oil prices remain stable and high, off-shore oil production will be one of the key driving forces of economic activity in the medium- and the longer-run." The report nevertheless emphasises that diversifying the country's endowments, including creating highly skilled human capital, is essential for a more inclusive and sustainable development in the long run (WB, 2013). Higher education is arguably one of the most important and strategic areas of policy for accomplishing this goal.

In the context of global competition and the need to diversify the economy, the project team has identified six priorities that must be addressed if Kazakhstan is to achieve the President's vision for 2050. These priorities are critical elements in addressing the development of human capital. The first three priorities target areas for improved performance of the system. The final three priorities address public actions related to the overall system capacity, financing, and leadership and governance necessary for achieving the improved system performance.

Priorities

Priority One: To improve performance and quality of tertiary education to globally competitive levels

National priorities and international evidence

This priority is recognised by the SPED which aims to "increase competitiveness of education and development of human capital through ensuring access to quality education for sustainable economic growth." The SPED outlines critical objectives and implementation steps to achieve this goal in two stages, 2011-2015 and 2016-2020. Target indicators include: increasing the number of nationally and internationally accredited HEIs; increasing the number of graduates employed in their area of specialisation after one year; the improvement of Kazakhstani HEIs in international rankings;

62 It is important to note that the OECD data on tertiary education-level educational attainment includes International Standard of Classification of Education (ISCED) 5A programs which are theory based and of a minimum of three year duration, as well as ISCED 5 B and ISCED 6 (Advanced Research). The OECD definition of ISCED 5B programmes is that, "They are typically shorter than those of tertiary-type A and focus on practical, technical or occupational skills for direct entry into the labour market, although some theoretical foundations may be covered in the respective programmes. They have a minimum duration of two years full-time equivalent at the tertiary level." http://stats.oecd.org/glossary. The key point here is that Kazakhstan does not, at present, have a category 5B to define its levels and fields of education. This issue will be discussed later in the report.

63 The increase in degrees must be matched by an increase in quality of outcomes (skills). In all countries, a higher percentage of the population with tertiary education is correlated with higher skill levels, but the difference in skills between secondary and tertiary in some countries is less than one might expect (Schleicher, A. (2012), "What Does the Future Hold for Higher Education," presentation at IMHE General Conference, September 19, 2012, Paris. Based on analysis of tertiary education attainment in relationship to results of survey of skilled conducted through the OECD Programme for Assessment of Adult Competencies (PIACC).

increasing HEI activities in innovation and R&D and technology transfer; increasing the number of scientific publications; and increasing the participation of young people in youth policy activities (MES, 2010, p.5).

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Provision of Higher Education

In purely quantitative terms, Kazakhstan's progress since it became an independent nation has been impressive. Following the dissolution of the Soviet Union in 1991, the government legislated for the establishment of private universities in 1993. It was quickly perceived that a market economy required a significant increase of people with commercial skills and legal qualifications, and that there were profitable opportunities in supplying these. The number of HEIs increased from 55 in 1991 to 181 in 2004/2005. Such a rapid increase in the number of small private institutions, however, engendered concerns about the quality of the education they supplied. Therefore, as part of its higher education reform strategy, the MES has developed a programme to "optimise" the system by steadily reducing the number of institutions and by introducing accreditation requirements for all HEIs in order to improve systematically the quality of teaching and learning. Accordingly, since 2004 the numbers of HEIs have been declining steadily (see Table 11).

Table 11. Higher education institutions at beginning of academic year, 2007-2008 through 2012-13

	2007 -08	2008 -09	2009 -10	2010 -11	2011 -12	2012 -13	% Change '07-08 to 2012-13
Private	113	90	93	94	93	86	-24%
Public	54	53	55	55	53	53	
Total	167	143	148	149	146	139	-17%
%Private	68%	63%	63%	63%	64%	62%	

Source: Republic of Kazakhstan, MES, National Center for Educational Statistics and Assessment (NCESA) (2013). Statistics of Education System of the Republic of Kazakhstan

Virtually the entire recent decline in numbers has been of private institutions, but these still constitute the numerical majority.

An important tool in this optimisation strategy is to tie state funding to those institutions that have obtained national accreditation. This measure, which is to be fully implemented by 2015, is further discussed below.

The growth in the number of HEIs before 2005 made possible a considerable growth in tertiary enrolment. The gross enrolment ratio, defined as the total number of students expressed as a percentage of the population of "university age", which in Kazakhstan is defined as 18-22[64] had been 40% in the late 1980s and had fallen after 1990 to 31% in 1996 but then recovered to over 52% ten years later. The absolute numbers of higher level students in Kazakhstan rose from 419 000 in 1996 to 776 000 in 2005-6. It then fell sharply in 2007-8 to 2009-10, recovering slightly to 630 000 and then declined sharply in 2012-13 to 571 691 (NCESA, 2013). (Table 12).

64 UNESCO, Institute of Statistics interactive database. http://www.uis.unesco.org/pages/default.aspx?&SPSLanguage=EN

Table 12. Tertiary enrolment 2003-04 to 2012-13

	Student numbers	Gross tertiary enrolment rate (%)
2003/4	658 106	44.5
2004/5	747 104	47.8
2005/6	775 762	52.7
2006/7	768 442	52.8
2007/8	717 053	50.5
2008/9	633 814	45.9
2009/10	610 264	40.0
2010/11	620 442	38.5
2011/12	629 507	40.8
2012/13	571 691	43.2

Source: (NCESA, 2013, Table 2.6.4.)

Since courses can vary in length, students enter at different ages, and enrolment figures include extramural[65] students not necessarily seeking a first university qualification; therefore gross tertiary enrolment is not an ideal snapshot of the proportion of each cohort receiving higher education, but it does indicate the extent to which a change in student numbers can be attributed to demographic factors or some other explanations. If the changes in student numbers related primarily to demographic changes, one would expect no change in the gross enrolment rate. This was the case in the three years 2009-10 to 2011-12. A change in the rate when the population is changing only slowly, as in 2004-5 to 2006-7, or even changing in the opposite direction, as in the most recent academic year, means that other factors must have been the main determinants of student enrolment .

The gross tertiary enrolment rate is also a convenient basis for international comparisons, since it is the measure of participation favoured by UNESCO's comparative database.[66] Table 13 indicates that the university enrolment rate in Kazakhstan is still well below most OECD countries. However, it is not out of line with the average of countries of a comparable income level.[67]

65 Extramural courses are those in which students study in a "correspondence course" mode with only limited contact with academic staff and are not subjected to assessments comparable to full-time students.

66 UNESCO uses the term "gross enrolment ratio."

67 Kazakhstan is currently classified by the World Bank as an "upper middle income" country.

Table 13. Tertiary gross enrolment ratio, 2010/11

Country	Gross Enrolment Ratio
Australia	79.9
Canada	m
Republic of Korea	103.1
Denmark	73.7
Finland	93.7
Estonia	64.3
Ireland	66.2
Japan	59.8
Republic of Korea	103.1
United Kingdom	59.7
United States of America	94.8
High Income OECD countries	72.6
Upper Middle Income countries	35.1
Kazakhstan	38.5

Source: UNESCO, Institute for Statistics database; World Bank education statistics database http://data.worldbank.org/data-catalog/ed-stats.

The population aged 15-29 from which the majority of tertiary students come will continue to decline for the next decade and will return to its current level only in 2020. This means that it will be possible to increase enrolment rates substantially (even if not quite to OECD levels) without major increases in the number of places.

Table 14. Projected population ages 15-19

	Population 15-19 ('000)	2010=100
2010	4 360	100.0
2015	4 051	92.9
2020	3 617	83.0
2025	3 843	88.1
2030	4 379	100.4

Source: UN Population Prospects, 2012 Revision (http://esa.un.org/wpp/Excel-Data/population.htm)

**Estimated 2010, and Medium Projections 2015-30*

Other data suggest that the educational gap expressed purely in numerical terms between Kazakhstan and OECD countries is narrower than the gross enrolment rate implies (see Appendix O). It is remarkable that the older Kazakh age groups have a higher level of tertiary education than younger ones, and also than their generational equivalents in several OECD countries. There has not been time to explore to what extent, if any, the apparent discrepancy between comparisons drawn from the Table 14 and those based on the gross enrolment rate can be attributed to definitional differences on attainment between the former Soviet Union and OECD countries.

Part of the recent fall in the gross enrolment rate can be attributed to the decrease in the number of students studying in extramural courses (Table 15). In 2009, only 52.2% studied full-time. By 2012-13, the percentage studying full-time had increased to 63.4%, the percentage studying in extramural courses declined to 34.2%, while the percentage studying in evening courses increased slightly to 2.4% (NCESA, 2013, Table 2.6.7) .

Table 15. Enrolment in higher education institutions at the beginning of the academic year in thousands

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Total enrolment	717.1	633.8	610.3	620.4	629.5	571.7
Full-time	375.9	331.0	318.7	329.4	360.9	362.6
Evening	2.1	1.6	2.6	5.7	9.1	13.6
Extramural	339.1	301.2	289.0	285.3	259.5	195.5
Percentage of total enrolment						
Full-time	52.4	52.2	52.2	53.1	57.3	63.4
Evening	0.3	0.3	0.4	0.9	1.4	2.4
Extramural	47.3	47.5	47.4	46.0	41.2	34.2

Source: NCESA (2013). Statistics of Education System of the Republic of Kazakhstan

The rather remarkable increase in full-time enrolment in 2011-12 and a rise in the number of evening students was accompanied by a striking fall in the number of extramural students, which suggests that part of this change might be a reclassification of some of the extramural students. On the other hand, the drop in extramural enrolment in 2012-13 was even greater, and can clearly not be attributed to a reclassification of students. It appears likely, therefore, that this drop may also be attributed to a deliberate policy to reduce the number of extramural students because of concerns about the quality and integrity of many of these courses. It would be expected that most of the decline in enrolment would have been in private rather than public institutions. Surprisingly, this does not seem to have been the case (Table 16).

Table 16. Enrolment in higher education institutions at the beginning of the academic year, thousands of persons

	2007-08	2008-09	2009-10	2010-11	2011-12	Change 2007-08 to 2011-12
Public	398,3	349,1	332,6	321,1	317,7	-20,2%
Full-time	250,0	214,1	206,9	201,6	210,0	-16,0%
Evening	0,2	-	-	1,4	2,1	950,0%
Extramural	148,1	135,0	125,7	118,1	105,6	-28,7%
Private	318,8	284,7	277,7	299,3	311,8	-2,2%
Full-time	125,9	116,9	111,8	127,8	150,9	19,9%
Evening	1,9	1,6	2,6	4,3	7,0	268,4%
Extramural	191,0	166,2	163,3	167,2	153,9	-19,4%

Source: Project team's calculations based on MES, NCESE (2013). Statistics of Education System of the Republic of Kazakhstan

Although reducing the number of institutions and HEIs is a necessary component of a strategy to raise institutional and graduate quality, there is an obvious danger that it will have a disproportionate impact on poorer and/or more rural populations, and therefore reduce social equity. This is the focus of the next section.

Access and Equity

For an aspiring student to be admitted to a HEI, there must be a place that is physically available to her/him, that will admit her/him and that s/he can afford. The project team notes immediately below that the policy of reducing the number of HEIs, which is essential if Kazakh institutions are to ensure the quality of teaching and learning and to gain national and international accreditation and recognition, appears to have a disproportionate impact on oblasts with a greater incidence of poverty.

This is followed by a discussion of the admissions system. Later in this chapter, the issues of university financing will be discussed, including the relative role of private fees and state subsidies, which raises questions of both efficiency and equity.

Table 17 compares the proportionate change in the levels of tertiary enrolment in each Oblast between 2003-04 and 2009-10 (as measured as a percentage of the total Oblast population in 2009) with the level of income and degree of poverty in 2009.

Table 17. Oblast income levels and changes in tertiary enrolment, 2003-2010

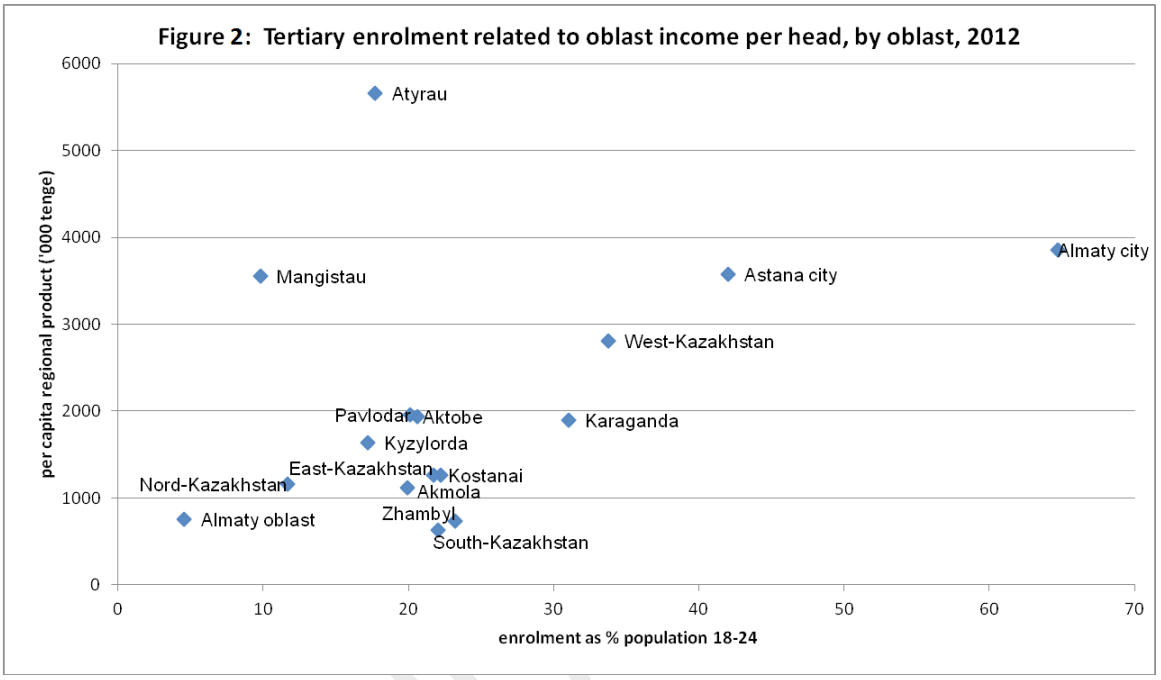
Oblast	Index of per capita gross regional product, 2009	Proportion of oblast population classified as poor, 2009	Tertiary enrolment 2009-10 as percentage of oblast population	Change in enrolment between 2003-4 and 2009-10
Republic of Kazakhstan	100.0	8.2	3.8	-7.3
Akmola	67.4	5.9	2.4	-20.2
Aktobe	106.3	6.3	3.4	-17.3
Almaty	40.2	15.5	0.6	-4.4
Atyrau	361.9	10.0	3.1	-31.7
West-Kazakhstan	129.6	8.2	4.2	-4.8
Zhambyl	32.1	4.8	2.5	-13.9
Karaganda	106.7	3.9	4.2	-17.1
Kostanai	77.4	6.8	3.3	-17.6
Kyzylorda	88.8	10.4	2.2	-16.5
Mangistau	212.8	22.6	1.8	-55.6
South-Kazakhstan	35.2	11.7	3.1	-16.0
Pavlodar	109.8	6.2	3.0	43.3
North-Kazakhstan	64.2	7.3	1.7	-57.9
East-Kazakhstan	66.6	6.6	3.4	-0.5
Astana city	207.2	3.9	5.9	21.8
Almaty city	218.3	3.0	13.5	13.0

Source: Kazakhstan Statistical Agency (2012), National Accounts of the Republic of Kazahstan 2006-10, Astana 2012, pp. 51-2, Table 3.1

As indicated in Figure 2, tertiary enrolment is correlated with the relative Oblast per capita income (r=0.4).

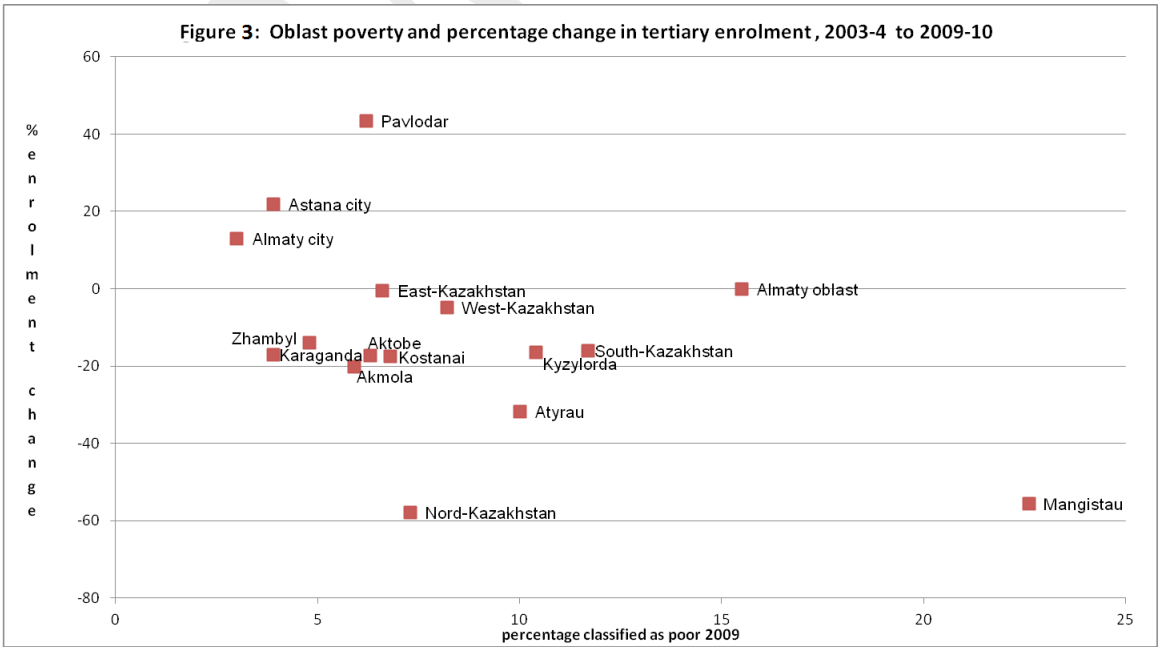
As shown in Figure 2 there is a correlation between tertiary education enrolment and Oblast per capita income. The relative change in enrolment (Figure 3) is not correlated with income per head, but it is correlated with the proportion of Oblast population classified as living in poverty (r=0.49). This has serious implications for equity, which are discussed below.

Figure 2. Tertiary education enrolment related to Oblast per capita income



Source: Kazakhstan Statistical Office

Figure 3. Oblast poverty and percentage change in tertiary education enrolment



Source: Kazakhstan Office of Statistics

Another aspect of geographic differences in enrolment levels is that between rural and urban areas. Data in recent reviews and reports (MES, 2012a, OECD, 2013) highlight that school graduates in rural areas, especially those from small schools, are disadvantaged in gaining access to full time higher education studies in Kazakhstan because of the quality of their education. Data from the UNT report shows that, in 2012, students in rural schools scored an average of 10 points lower than urban students. The forthcoming OECD review will draw attention to the fact that "students in regions which are sparsely-populated, have high numbers of small rural schools and/or a high level of social disadvantage, do considerably worse." (OECD, 2013).

Moreover, there is anecdotal evidence that some students who may have benefitted from better urban secondary education are transferring to rural schools for their final year where they have a better chance of getting a scholarship as they can qualify for one of the 30% quota of rural scholarships, thus displacing rural students for third level places. While the team does not know how widespread this practice is, the issue is discussed in the Chapter on pre-school and secondary education. The "rural-urban" divide is perpetuated at postgraduate level; for example, only 3% of Bolashak Scholarship[68] students destined for international studies come from rural backgrounds. This rural urban divide intensifies the risk of social unrest among young persons who cannot get a job.

Progression

The National Report on the Status and Development of Education expressed concern that the proportion of tertiary students who enroled in 2010-11 who dropped out during the year had risen by 1% - to 11.9% - compared with the previous year, after falling for three years (MES, 2012b),[69]. Average dropout rates from private education were marginally higher (13.6%) than from state institutions (10.2%). Non-completion was significantly higher among extramural and evening[70] students with 15.6% of extramural and 8.7 % full time dropping out. Twenty per cent of students cited financial difficulties as a reason for dropping out with a further 8.6% citing academic difficulties.[71]

Admission Policies

The Unified National Test. Since 2003-04, admission to higher education in Kazakhstan is on the basis of scores achieved in the Unified National Test (UNT) a combined school-leaving and university entry test. In 2012, 117 333 (75%) of the total number of school graduates in Kazakhstan took the UNT, 4.02% lower than in 2011. Their average score was also lower, mainly because of minor changes in the test. The deficiencies of the UNT, both as a school leaving and university entry test, were discussed in the 2007 OECD Review and will be further highlighted in the Roadmap report of the Cambridge Group as well as in the forthcoming OECD review. Briefly, these are: i) the test is limited to four subjects only and uses multiple choice questions which depend on luck rather

68 Presidential Bolashak Scholarship Programme through which talented young people are fully supported to study abroad in leading institutions at graduate level.

69 It is likely that there was a further increase in this proportion in 2011/2012. Unfortunately, there is a clear error in the MES, NCESE, *Statistics of the Education System* (2013) (Table 2.6.15) in the figure for Mangistau Oblast that prevents an exact comparison of these years. Omitting Mangistau in both years shows a rise from 11.8% to 12.8%.

70 In the MES, NCESE (2012), *Statistics of the Education System of the Republic of Kazakhstan*, higher education provision (ISCED 5 and 6) is discussed under three headings: i) full time; ii) evening and iii) extra-mural.

71 More detail on the reasons given for dropping out is available in Table 2.6.15 of the MES, NCESE (2012), *Statistics of the Education System.*

than knowledge; ii) questions are narrowly limited to those that appear in school textbooks and do not probe understanding or judgment or reasoning skills; iii) students are encouraged to focus on memorisation exercises in the four subjects required with a consequent narrowing of the curriculum; and iv) teachers focus on more academically gifted students because financial rewards accrue to those teachers whose students do best in the test. This emphasis on memorisation is at the expense of developing the intellectual skills that are required both in the workplace and in higher education.

The Complex Test. The Complex Test (CT) provides an alternative form of entry to higher education and is most commonly taken by students from Technical Vocational Education (TVE) colleges, or those leaving school without the UNT or from outside the country. Because graduates from the TVE colleges were allowed to take the test for the first time in 2012, the numbers taking the CT rose from 26 525 in 2011 to 65 439 in 2012. As a test, the CT suffers from all the imperfections of the UNT with an emphasis on the same testing procedures for a limited number of academically oriented subjects, which are unlikely to be of practical use to the TVE students, who make up 78% of the total of CT takers, for their future more applied tertiary educations studies or for their future employers. Moreover, the team understands that TVE students, wishing to attend higher education, are required to take the Complex Test even though they are examined in subjects that they may not have studied for some years.

Transition to 12 years of school education. One objective of Kazakhstan's transition to a 12-year education model, planned to begin in 2015[72], is that in the newly created grade 12, students will follow a curriculum close to what is now taught in the first year of tertiary education. In theory, the last two years of secondary education will be in competency–based profile schools although it is not yet clear whether it is intended to roll out this model to all schools. This reform is designed to improve learning outcomes while removing the need for third level students to attend a remedial course that is both inefficient and demotivating.

Improving Quality

Kazakhstan has made progress towards assuring institutional quality as an important dimension of the country's human capital and competitiveness strategy. Kazakhstan has rightly placed the need to establish accountability processes and mechanisms for the review, assessment and accreditation or certification of tertiary education quality at the heart of its S.

Following on the recommendations of the 2007 OECD Review, a new system for ensuring institutional quality through independent accrediting bodies is being implemented. By 2013, 3.6% of the total of 139 HEIs had received full institutional accreditation with a further 16.6 % expected to reach that goal by the end of the year and approximately the same numbers of institutions receiving discipline-specific accreditation. The proportion of publicly funded (national and state) institutions that is expected to be accredited by the end of 2013 is 38%, compared with 13% of private institutions.[73]

Accreditation is voluntary; however, there are two main incentives to encourage all HEIs to seek it. Once accredited, HEIs may issue their own degrees, are no longer required to go through the MES attestation process[74] and are free to adapt the State Standards to their own more flexible

72 It is planned to have six years of basic secondary education from grades 5 through 10, and an upper secondary education system that will cover grades 11 and 12.

73 Project team interview with National Accreditation Center. April 2013.

74 The attestation process provides the means for governmental control of HEIs through licensing and compliance procedures. As a quality assurance instrument it relies on central control and not on institutional responsibility for quality.

institutional requirements (Bachelor's programmes may be modified by 50%, Master's by 70% and Ph.D. programmes by up to 90-95%); and as referenced above, as of 2015, public funds for Bachelor's programmes (2014 for Master's and Doctorates) will be provided only to those HEIs that are accredited and, in order to enrol publicly funded students, a HEI will be obliged to have at least one programme accredited.

Kazakhstan has adopted the required laws and regulations to join the Bologna process and has established the Academic Mobility Center. Work is also in progress on the development of an eight level Qualifications Framework. When fully implemented, these initiatives will provide the basis for comparability of outcomes and enhance the potential for student mobility. However, the team was made aware that the implementation of the Bologna process is not without difficulty for HEIs and for academics because of the inherent differences between European and US systems of higher education. Moreover, the adoption of the European Credit Transfer and Accumulation System (ECTS) is of undoubted benefit to Kazakhstan for the recognition of attainment at Bachelor's and Master's degree level. However, current practice in those institutions that are oriented towards the United States recognises the accumulation of credits based on the number of credit hours. This dual approach is potentially confusing as there is some tension between the two systems. These issues were also mentioned by the World Bank with a recommendation that Kazakhstan should take steps to identify the useful and beneficial elements of the European process where further development would be appropriate while, equally, identifying those elements where a "change of course" might be beneficial in reconciling European and US systems (WB, 2012, p.1). Other initiatives include the establishment of an independent system for qualification validation.

One key element of the quality of a tertiary education system is the extent to which the appropriate diversity of educational institutions to cover both individual needs and those of the labour market are provided. Indeed, international literature has identified diversity as a major factor in the provision of successful higher education (Van Vught, 2008, p. 154). A system with a range of different kinds of HEIs may be expected to provide choice for students; to be responsive to changing labour markets; to offer opportunities for innovation and to expand opportunities for flexible, work-oriented study. Moreover, there is general agreement that diversity of mission will also assist in increasing participation (OECD, 2008a). Reflections on the type and structure of HEIs in Kazakhstan will be taken up in Priority Number Four.

Problems that need to be addressed

Reforming of the admissions systems based on UNT/Complex Test. The National Strategy proposes that there will be separate school-leaving and university entry tests from 2015. The proposed new national test would identify those students who would proceed to colleges and into the proposed new 11th and 12th grade. The existing UNT and Complex Tests would then be abolished and replaced by a new third level entry test. The team was unable to determine the nature of the proposed new third level admission test other than that it would aspire to test student abilities rather than rote learning. It is essential that this proposed new admission system will be objective, will follow internationally excellent models and will not, in any way, return to the former practice of universities alone determining their own entry requirements, a practice which permitted corruption to flourish.

Improving the quality of secondary education. The forthcoming OECD Review will conclude that the results of PISA 2009 and TIMSS 2011 give a clear message that, while the Kazakh secondary education system can impart theoretical knowledge and information on a rote-learning basis, it is not equipping students with the critical thinking skills needed for a competitive economy. The school

curriculum is rigid and does not develop thinking skills. A major challenge will be to roll out the Nazarbayev Intellectual School (NIS) model.

Improving the quality of pedagogical universities. A significant percentage of the rural undergraduate state educational grants are targeted for studies at pedagogical universities (MES, 2012b). However, recent and forthcoming reviews of education in Kazakhstan have expressed concern about the quality of pre-service teachers' courses in these pedagogical universities. This, together with teachers' pay and conditions (teachers are paid by contact hour) has a direct impact on the quality of the entire education system.

Addressing issues of language of instruction. Because 60% of the population is ethnic Kazakh, there is a potential access issue for Kazakh speaking students, especially from rural areas. Moreover, the non-availability of textbooks and learning materials at third level raises equity questions. Currently there are plans to develop programmes to raise the quality of Kazakh language teacher training and to improve the availability of learning resources in Kazakh.[75]

Establishing pathways from technical vocational education (TVE) to tertiary education and opportunities for lifelong learning. The absence of pathways between general and vocational education at secondary, upper secondary and tertiary level was highlighted both in the 2007 OECD Report as well as in the 2010 report on TVE by the European Training Foundation (Ouzoun, 2010).Recent developments, including the reorganisation of the TVE system and the ongoing development of the National Qualifications Framework, will result in clearer pathways for all learners. However, ladders and bridges to facilitate transfer and to recognise prior learning do not seem to exist. Moreover, anecdotal evidence and discussions in several current studies suggest that students and parents in Kazakhstan, in common with many other countries, are biased against technical and technician education and consider that, in all cases; it is inferior to academic learning.

Addressing issues of institutional responsibility for quality assurance. Overall, the focus on quality in higher education in Kazakhstan continues to be input-oriented and to be based on indicators such as academic qualifications and spending per student. The team was struck by the fact that, in spite of the mobility frameworks and institutional accreditation procedures discussed above; there remains an emphasis on centralised quality control and on compliance rather than on a culture of quality assurance and self-evaluation at the institutional level.

Harnessing the potential of technology. Given the distribution of education and training institutions at regional level and the need to increase provision and enrolments, it is to be expected that new technology will be used to enhance access to good quality education and training. In this context, it is a positive development that between 2007 and 2010 the share of people in Kazakhstan with connection to the Internet has multiplied from 4.0% to 33.4%. This share, however, remains well below that of highly developed economies. The average rate in OECD countries is 68.3% and in high income OECD countries is 74.7% (OECD, 2013).

Addressing issues of mistrust in the integrity and quality of education. The reputational damage to the system is such that students, their families and potential employers are not convinced of the quality or integrity of educational outcomes from even the best institutions. This lack of trust may be summarised under the following headings:

- There is a culture of student cheating in HEIs;
- Academics are reported to request bribes in order to grade papers and to award passing grades in examinations;

75 This issue is the subject of a paper on Trilingualism being prepared by the Cambridge Group.

- Institutions allow progression of publicly funded students because to fail them would result in a loss of income.

Priority Two: Align higher education to meet the labour market needs of a rapidly changing, increasingly knowledge-based, technology-intensive economy

National priorities and international evidence

The increase in the stock of human capital and the growth of the economy are interdependent in a market economy.

"Tertiary education has become a central means by which young adults equip themselves for working life – or working adults refresh their skills. In some countries it is now the leading means by which they do so, accounting for a larger share of new entrants to the labour market than any other education or training pathway." (OECD, 2008a)

In Kazakhstan, the President's 2050 goal identifies the development of human capital as a key to the country's future global competitiveness and highlights the importance of orienting vocational and higher education to the current and future labour market.

The project team begins with an overview of the Kazakh labour market. Economic growth requires an increasingly skilled labour force and also provides the incentive to individuals to acquire the necessary skills. It will be useful, however, to distinguish the two processes – to discuss first how the labour market is likely to evolve on the assumption that economic growth is constrained by factors other than the supply of human capital, and then to consider the implications of the expected pattern of this growth on the demand for educated labour and consequently for the educational system.

A separate Roadmap report deals with the reform to date of the TVE system including the occupational structure of the Kazakh labour market.[76] The relationship of the pedagogical universities to the labour market for teachers is discussed in the Roadmap Report of the Cambridge based team. Therefore the focus on this section of this report is on the relevance of the education provided by the HEIs in Kazakhstan (ISCED level 5A and 6) covering the far larger mass of university graduates, whose careers will be spent in Kazakhstan, in professions such as medicine and law, in senior civil service positions, and in important managerial and specialist positions in the private sector and academia.

The expected evolution of the economy in Kazakhstan

It is not possible accurately to assess how the Kazakh economy will develop in the next ten years, let alone during the working life of somebody who will graduate in 2013. There is no reason to expect a slowing of the advance of technological knowledge, the Internet has assured its costless and rapid dissemination, and it is likely, though less certain, that the barriers to international trade will continue to fall. While these processes will have more impact on the demand for some graduate skills than others, it is reasonable to predict that virtually all will be affected. So today's graduate in any country is likely to find that the demand for his/her professional knowledge and expertise will change very strikingly during his/her career. It is essential that at least the first university degree of any graduate provide the foundation on which later professional specialisations can be based and, through what is usually called "lifelong learning", be frequently updated.

76 Vladimir Gasskov, Report of assessment of the TVE developments in Kazakhstan. July 2013. Electronic copy.

Although OECD countries may lead in innovation, the virtually costless sharing of information about new technologies makes it likely that these will be adopted in poorer countries more quickly than in the past, and combined with the diminishing importance of trade barriers, means that poorer countries will grow more rapidly than richer ones – as east and south Asian economies have started to do. Their geographic position implies that their markets, particularly China's, are likely to grow in importance for Kazakhstan, especially since they are major importers of the energy and other minerals that dominate Kazakhstan's exports (78% in 2011). A non-specialist cannot possibly attempt even a guess at what effect rapid technological advances such as fracking will have on energy prices, how global demand will be affected by the necessity to replace fossil fuels by renewable energy, and attempts to promote less polluting methods of transport, or how political instability in the Middle East could affect Kazakhstan's competitors, but nevertheless it is difficult to imagine that minerals will not continue to dominate Kazakh exports for the near and medium-term future.

Oil, gas and other minerals activities use relatively little labour. The main challenge for Kazakh economic policy will be to find ways to utilise its labour force in productive jobs, without erecting trade barriers that would destroy its ambitions to be an increasingly competitive economy. So far, it appears to be doing well in its labour utilisation, especially with respect to graduates. In 2011, average unemployment was 5.4% of the labour force, 473 000 individuals. Twenty five percent of these (118 000) had tertiary education.[77] Currently 30% of the labour force has tertiary or uncompleted tertiary education.[78] It is therefore probable that the graduate unemployment rate was under 5%.

The current structure of the labour force differs sharply from typical levels in comparator countries, with a much higher proportion of its labour force in agriculture, emphasising that, in development terms, Kazakhstan is very much a "middle income country."

Table 18. Structure of the labour force, Kazakhstan, 2011, and comparator countries, 2010

	Primary	Secondary	Tertiary
Australia	3.3	21.1	75.5
Canada	2.4	21.5	76.5
Denmark	2.4	19.6	77.7
Estonia	4.2	30.1	65.1
Finland	4.4	23.2	71.9
Ireland	4.6	19.5	75.5
Japan	3.7	25.3	69.7
Korea, Rep.	6.6	17.0	76.4
United Kingdom	1.2	19.1	78.9
United States	1.6	16.7	81.2
Kazakhstan	29.0	16.5	54.5
Agriculture	(26.5)		
Mining and quarrying	(2.5)		

Sources: Comparator Countries: World Bank, World Development Report 2013. Kazakhstan.

77 Kazakhstan Statistical year Book.

78 Presentation on Technical and Vocational Education. Nazarbayev University. February 2013.

Note that in the Yearbook Mining and Quarrying is classified in Industry (i.e. a secondary sector), whereas in Table 18 it is classified as primary. The project team has not checked the definitions in comparator countries.

Comparative salary levels bear out the income gap between Kazakhstan and the comparator countries, although it must be noted that the data is not recent. In the first place the minimum wage remains remarkably low, at only $100 a month in 2010. The team does not know what proportion of the labour force depends on the minimum wage, although if the figure given for the sewing machine operator is correct, it suggests that there are indeed some workers that do. This implies that Kazakhstan has so far been able to avoid the so-called "Dutch disease" of energy exporters, where high productivity of workers in the oil and gas sector leads to a level of wages that makes other industries internationally uncompetitive. In 2011, average earnings in manufacturing were only a little over a half of those in mining and quarrying, also suggesting an absence of the "Dutch disease." Although obviously agriculture will remain highly important to the Kazakhstan economy for several decades, there is no reason to doubt that future economic growth will see a shift of labour into the secondary (industry and construction) as well as the tertiary (services) sectors, which has been the almost-universal experience of economic development. However, the economic history of former Soviet Republics is very different from all other countries, so the past experience of present OCED counties cannot be regarded as a reliable guide to the future course of Kazakhstan.

Table 19. Minimum wage for Kazakhstan and comparator countries, 2007 and 2010

	Minimum wage (2005 dollars per year)	
	2007	2010
Australia	13 464	13 896
Canada	13 104	17 952
Denmark	m	m
Estonia	3 264	4 236
Finland	18 816	22 212
Ireland	16 992	19 308
Japan	12 108	14 652
Korea, Rep.	6 960	6 756
United Kingdom	16 044	16 188
United States	13 992	13 488
Kazakhstan	864	1 200
China	1 080	1 728
Russian Federation	2 544	3 816

Source: World Bank (2013), World Development Report, 2013 Occupational Wages around the World

Table 20. Wages in selected occupations, 2005 (dollars per year), Kazakhstan and comparator countries

	Accountant	Chemical engineer	Bus driver	Sewing machine operator
Australia	40 267	59 054	29 331	21 019
Canada	37 540	60 033	21 033	13 125
Denmark	123 067	116 081	51 740	47 102
Estonia	M	m	m	m
Finland	59 695	55 887	32 263	24 554
Ireland	M	m	m	m
Japan	M	m	30 710	19 914
Korea, Rep.	38 755	29 415	14 647	13 698
United Kingdom	60 352	33 624	30 880	22 402
United States	50 457	82 647	30 958	18 515
Kazakhstan	5 965	3 269	2 165	957
China	2 913	2 538		1 327
Russian Federation		2 780	2 922	1 542

Source: World Bank (2013), World Development Report, 2013 Occupational Wages around the World.

It has not been possible for the team to examine the curricula of Kazakh university programmes. But it is possible to consider the mix of disciplines in which students now graduate, and to ask what this implies about their readiness for the labour markets they are likely to encounter. The answer is worrying, and suggests that merely comparing the gross enrolment ratio with those of comparator countries may give a misleadingly optimistic picture of Kazakhstan.

A comparison of the distribution of the fields of study by the graduates of HEIs shows a very marked divergence between Kazakhstan and comparator countries.

Table 21. Distribution of graduates by field of study, Kazakhstan and comparator countries, 2011

	Education	Humanities and arts	Social sciences, business and law	Science (incl math)	Engineering, manufacturing and construction	Agriculture (incl veterinary)	Health and welfare	Services	Unspecified
1. Australia	10.2	10.8	42.7	10.0	7.4	0.7	15.4	2.7	
2. Canada	11.1	11.7	37.6	12.5	8.2	0.8	11.4	3.4	3.3
3. Denmark	8.4	12.7	31.2	9.0	11.0	1.4	24.0	2.4	
4. Finland	6.7	13.7	24.7	8.0	19.8	2.1	19.4	5.7	
5. Estonia (2010)		13.6	36.4	10.4	13.4	2.2	9.1	8.0	6.9
6. Ireland	10.7	16.8	31.1	12.7	9.4	0.8	15.9	2.4	0.1
7. Japan	6.4	17.1	33.9	4.5	18.7	3.4	7.4	2.4	6.2
8. Republic of Korea	9.4	18.3	24.3	9.4	23.1	1.4	9.7	4.5	
9. United Kingdom	9.1	16.8	34.4	13.6	9.7	0.8	13.4	1.4	0.7
10. United States	11.4	14.7	39.8	9.0	6.2	1.0	12.0	6.0	
Kazakhstan (2013)	21.0	4.1	44.9	1.9	17.9	1.6	3.2	5.1	0.2

Sources: OECD countries except Estonia: https://docs.google.com/spreadsheet/ccc?key=0Ah- CUff _FH fxdEM0WmVDQ29zaUJIOEk5bnF4Y1gyOFE&hl=en#gid=1; Estonia (Eurostat) https://docs.google.com/ spreadsheet/ccc?key=0Ah-; CUff _FHfxdEM0WmVDQ29zaUJIOEk5bnF4Y1gyOFE&hl=en#gid=1; MES (2012), Kazakhstan Statistics of Education System of Kazakhstan, Table 7.6, p. 147. http://stats.oecd.org/ Index.aspx?DatasetCode=RGRADSTY

The very low enrolment in humanities and arts is not a surprise, since these were not emphasised in most Soviet higher level institutions, which focused, especially outside major cities, on producing relatively narrow specialists to suit the needs of local industries. The very low ranking of science is, however, surprising. This may be compensated by degrees awarded by pedagogical institutions and included here as education. The relatively low proportion of graduates in engineering, manufacturing and construction, which dominated the universities of the Soviet Union, however, is a surprise.

The proportion of graduates in health and welfare is remarkably low, reflecting that, as a Soviet Republic, Kazakhstan had access to medical graduates from elsewhere in the Soviet Union – as indeed it probably will continue to do. The stock of health manpower in Kazakhstan is not currently below OECD norms – indeed it appears particularly well supplied with physicians.

Table 22. Stock of health manpower, Kazakhstan and comparator countries

	Physicians per 1,000 people, 2006-11	Nurses and midwives per 1,000 people, 2006-11
Australia	3.9	9.6
Canada	2.1	10.1
Denmark	3.4	16.1
Estonia	3.3	6.6
Finland	2.9	24.0
Ireland	3.2	15.7
Japan	2.1	4.1
Korea, Rep.	2.0	5.3
United Kingdom	2.8	9.5
United States	2.4	9.8
Euro area	3.6	5.4
Kazakhstan	3.8	8.3

Source: World Bank (2013), World Development Indicators

The extremely high proportion of graduates enrolled in social sciences, business and law, probably reflects the response of private institutions to a shortage of the expertise in these fields that all the former Soviet Union countries faced during the transition to a market economy. The demographic structure of these occupations in Kazakhstan is therefore a young one, and the educational system is almost certainly producing a surplus. Moreover, as noted, the quality of these graduates is poor. Left to market forces, this surplus would eventually become evident in falling incomes and higher unemployment of these graduates, but it may be a considerable time before this becomes evident to career counsellors and students at secondary level unless deliberate steps are taken – e.g. insisting on higher standards of accreditation.

This raises a more general point. The allocation of expenditures on higher education is determined to a much greater extent by private decisions as opposed to educational policy decisions in Kazakhstan than in most, even possibly all, OECD countries. Current earnings differentials are likely to guide student choice. As the project team has observed in this chapter, these may be a poor guide to earnings in the future. The team has not had the information needed to explore the question: "if you had the task of advising a group of bright secondary school students about their choice of university course and subsequent career, what would you tell them?" There are also well-known reasons why the private return to education, as derived from wages and salaries, may differ from social returns, which include the many ways in which higher education benefits a whole society, not merely those who go to university. If educational policy makers become convinced that the current pattern of earnings may be leading to an unfortunate set of student preferences, this might be used both in determining the allocation of scholarships and public investment in university facilities.

Although one would need more analysis before making a definite assertion that educational policy should try to find ways to increase the output of engineers, scientists, mathematicians and computer scientists and reduce that of commerce and law graduates, this is strongly indicated.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Aware of the shortage of skilled labour, especially at the level of technicians and technologists, the government has developed a strategy (roadmap) aimed at: i) providing employment, ii) preventing unemployment, and iii) creating jobs [79]. In this context, it is worth referring to the fact that one third of the employed population has no vocational education, which highlights the importance of implementing a coherent lifelong learning strategy on a national basis.

Kazakhstan is implementing several new initiatives to strengthen the connection between higher education and the labour market, to depart from previous modes of identifying labour market needs by state orders and to create a lifelong learning system. For example, as an element of the TVE reforms seven "Kasipkor" Colleges are being established in an agreement between Holding "Kasipkor" and the "Pearson" company as well as with other international partners. These holdings include schools to train technicians in engineering, architecture and construction, information and communication technologies, design and engineering, agricultural sector, mechanical engineering, and an interdisciplinary school (School of Crafts). (MES, 2012b)

The establishment of the National Qualifications Framework in 2010 is a welcome development because, once implemented, it will enable and facilitate employer recognition of educational qualifications at all levels of the system. The project team notes that the President, in his recent *Social Modernisation* document, calls for the accelerated implementation of the National Qualification System, which he refers to as a "roadmap for each profession" into which all employees should be benchmarked [80].

In order to improve the relevance of university courses, the project team notes that plans are in place to help students progress by linking curriculum standards to professional associations, employers, and test experts.

Problems that need to be addressed

Inadequate numbers of graduates in relevant disciplines. In addition to the labour market analysis in this section, a 2010 labour market study found that there was a greater shortage of workers with basic vocational skills than of higher level graduates and reinforced the conclusion that there is also a shortage of workers with higher education, and especially of those with an interest in pursuing engineering and technical careers (WB, 2013, p. 21-22). Moreover, the World Economic Forum GNI indicator for the "Availability of Scientists and Engineers" ranked Kazakhstan as 104 of 144 countries (WEF, 2012, p.217). Based on the analysis and studies, it is clear that, in order for Kazakhstan to become more competitive, the country will need more graduates overall together with a larger proportion of graduates in science and technology.

Absence of ISCED 5B descriptor. Kazakhstan does not have an internationally recognised technician-level capacity at the tertiary education level of ISCED 5B (this descriptor is referenced in detail in Section Two). This gap means that Kazakhstan does not have a key capacity required in a globally competitive economy in which the demand for high-level technicians is increasing dramatically. While the new Kasipkor Colleges may be intended to meet this need, these colleges are not within the nation's higher education system and will not be recognised as such in international comparisons of Kazakhstan with other competitor countries. It also means that Kazakhstan will lag behind other competitor countries in the proportion of its workforce with a tertiary-level credential.

79 *Employment Agenda 2020*. Ministry of Education and Science of the Republic of Kazakhstan, English Version.

80 President Nursultan Nazarbayev (2012), Social *modernization of Kazakhstan: Twenty Steps Towards a Universal Labour Society*. 10th July 2012. Accessed electronically.

The most competitive countries (used as comparators throughout this chapter) all have strong technician-level tertiary education systems at the level of ISCED 5B (Tertiary B).

Absence of pathways through the education system. As discussed in Section Two, Kazakhstan lacks effective pathways from TVE to tertiary education and hence has very poor incentives for lifelong learning which should be an important social and economic goal for the education system. Anecdotal evidence suggests that graduates of the TVE system do not receive recognition for their qualifications and are required to begin all over again if they enroll in higher education. The project team considers that this is an overarching issue for the entire education system as it is also unclear how the move to 12-year secondary education will affect these pathways.

Strengthening information about career opportunities and the labour market. As noted above, it is not clear who collects, analyses and disseminates labour market information and makes this information easily available to school graduates and to their parents.

Relevance of programmes for the labour market and for research and development. It is unclear what, if any, the influence of the current labour market has on either the curriculum or on the accreditation process, both of which could be made substantially more relevant by the involvement of employers. Evidence cited by the World Bank (WB, 2012) mentions that Bachelor's and Master's programmes do not appear to be developing the intellectual or organisational competencies needed for top quality research work. There is a general concern about the quality of English language training at all levels throughout the system.

Priority Three: To build capacity for internationally recognised research and to integrate education, innovation and research in HEIs.

National priorities and international evidence

In the former USSR, the funding of basic research was mostly allocated to the institutes of the Academy of Sciences of the USSR and to national academies in the former republics on a central planning model. The funding for applied research and technological development was concentrated in the vast networks of institutes under the former branch ministries. Individual laboratories or researchers could not participate in grant competitions. Funding per researchers was low compared to developed countries. However, there was a tradition of co-operation between scientists from the different Soviet republics that contributed to raising the standards of research in all former republics, including the countries of Central Asia. Some research was conducted in the science departments of HEIs; however, except for a few prestigious universities in the European part of the Soviet Union, HEIs were regarded as second-rate research organisations (OECD and WB, 2007).

Recently Kazakhstan has focused on scientific priorities and enhancing the scientific and research capacities of HEIs. In 1999 Kazakhstan established a scientific commission to address the nation's need for applied science as well as recommendations for "public scientific and scientific, technological and innovation" policy for the nation. In 2001 the law on science was enacted. Priorities for research and innovation were identified and included energy research, innovative technologies in processing raw materials, innovation in telecommunication technologies, life sciences and basic research in the humanities and other fields. In 2003 Kazakhstan created the National Academy of Sciences of the Republic of Kazakhstan.

Since the law on science was established, Kazakhstan has made a concerted and successful effort to increase funding for HEIs to engage in scientific research. Data demonstrating this commitment and

priority will be discussed later. These policies established to support research reflect the President's 2050 vision emphasising the need for Kazakhstan to make scientific improvements in R&D and applied science in order to contribute to the country's competitiveness.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Kazakhstan higher education has several initiatives underway to build capacity in order to compete globally in research and innovation and to integrate education, innovation and research in HEIs. The primary strategies include: i) increasing funding for and the capacity of research universities to compete globally, while beginning to differentiate the missions of other institutions to focus on national, regional and local research or educational needs; ii) reorienting the Bolashak Scholarship Programme toward graduate studies (Master's and doctoral candidates) to study in international universities; and iii) developing of Nazarbayev University as a national model for the development of research capacity.

In addition, Kazakhstan has taken a number of important steps to strengthen its capacity for research and innovation. These include:

- the scheduled establishment of one to two research and ten innovation universities;
- clarification of the mission of research universities to focus on;
- generation of knowledge, efficient technology transfer to economy;
- wide range of fundamental and applied research; and
- development of a system for training highly qualified staff.

Focus on Research and Innovation

Government spending on R&D in Kazakhstan has been growing over the last 5 years, with an overall increase of 4% from 2007 to 2011, even with declines in spending from 2010 and 2011. The government has also shifted more R&D spending to HEIs - between 2007 and 2011 R&D spending at HEIs has increased by 70% or USD 19 million, with declining R&D expenditures for other institutions. See Table 23 below showing changes in research expenditures in US dollars.

*Table 23. Expenditures for R&D (millions of US Dollars)***

Year	2007	2008	2009	2010	2011	Growth 2007-2011	% increase 2007-2011
Government expenditures	$68.27	$73.20	$98.31	$81.00	$70.92	2.66	4%
Higher education institutions expenditures	$27.28	$33.85	$38.78	$37.71	$46.48	19.20	70%
Government expenditures on other institutions*	$40.98	$39.35	$59.52	$43.29	$24.44	-16.54	-40%

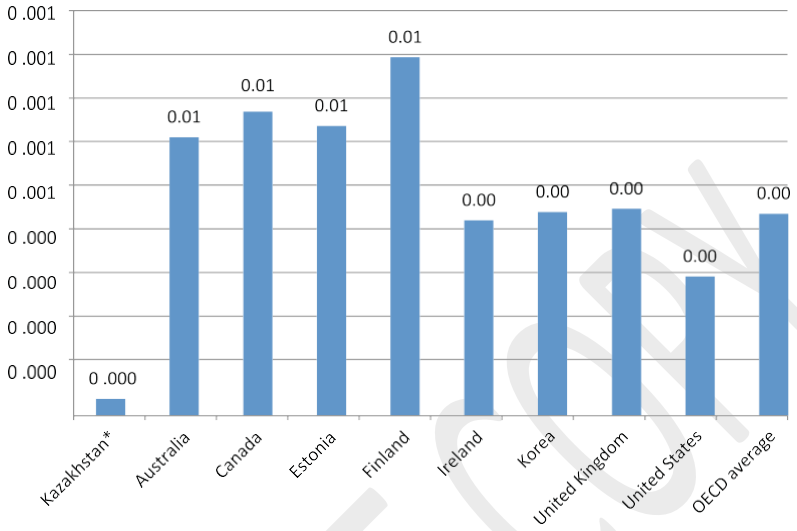
Source: Republic of Kazakhstan, Agency of Statistics (2012), www.stat.kz Nauka i Innovatsionnaya Deyatel'nost' Kazakhstana. 2007-2011. Statisticheskiy Sbornik. Agentstvo Respubliki Kazakhstan po Statistike. Astana, 2012. www.stat.kz

*Notes: *This is a calculation of how much R&D funding is spent on non-HEIs (total government expenditures subtracting expenditures for HEIs). **Based on conversion of KZT to USD at a rate of 0.006547 on 7/5/2013.*

International Comparisons

Even with the increased investment, Kazakhstan spends much less than its international competitors on R&D at HEIs, as a percent of GDP. Total research expenditures in Kazakhstan (HEIs and research institutes) are approximately .038% of GDP, with a goal to increase research spending to 1 per cent by 2015. (See Figure 4).[81]

Figure 4. Spending on R&D as a percent of GDP



Source: OECD (2013), Education at a Glance 201, Table B2.4 for international data other than Kazakhstan. Kazakhstan spending on R&D from the Agency of Statistics of the Republic of Kazakhstan. Kazakhstan GDP data from World Bank.

Note: In the figure above the amounts for OECD countries represent the total amount of R&D money spent at tertiary education institutions. However, the amount for Kazakhstan includes both government spending on R&D at universities and at other non-academic institutes.

Capital Expenditure for Research

Capital expenditures for R&D have been expanding rapidly, growing more than 300% in the last 5 years. It is unknown how much of this is for development of new facilities or renovation and improvements in existing facilities.

Table 24. Domestic expenditures for R&D: capital expenditures

Year	2007	2008	2009	2010	2011	Growth 2007-2011	% increase 2007-2011
mln. KZT	1 098	1 076	451	1 352	5 144	4 046	368%
Million USD	$7.19	$7.04	$2.95	$8.85	$ 33.68	$26.49	368%

Source: Republic of Kazakhstan. The Agency of Statistics of the Republic of Kazakhstan. www.stat.kz Nauka i Innovatsionnaya Deyatel'nost' Kazakhstana. 2007-2011. Statisticheskiy Sbornik. Agentstvo Respubliki Kazakhstan po Statistike. Astana, 2012. www.stat.kz

81 Note: Although Denmark and Japan are included in other international comparisons there was no comparable data for those two countries on this metric.

According to those the project team interviewed, Kazakhstan continues to have a far higher percentage of applied research and lower percentage in R&D, compared to international norms (Nazarbayev University, 2013).

Table 25. Per cent of R&D in different kinds of research, Kazakhstan and international norms

Type	Current per cent	Norm for comparison
Fundamental research	21	20
Applied research	71	30
R&D	8	50

Source: Nazarbayev University. Presentation to project team, February 2013, slide 3

In order to increase policy leadership for research, Kazakhstan has initiated a number of national level review commissions, including the Supreme Scientific-Technical Commission chaired by the Prime Minister, National Research Councils to establish national priorities for research, and the State Center for Scientific and Technical Expertise under the MES to oversee the international peer review process for research publications.

In terms of supporting the higher education research enterprise, Kazakhstan provides funding for research in three categories: i) "basic" or maintenance grants to research organisations; ii) "grants" (competitively awarded research grants); and iii) programme-targeted funding to support research programme development (Nazarbayev University, 2013). Data are incomplete in terms of the level of support for each of these activities.

Bolashak Scholarship Programme

A key priority for Kazakhstan is the development of the human resources necessary for competitive research. The Bolashak Scholarship Programme, instituted by the President in 1993, provides scholarships to students for study in international universities. Until recently, the scholarships were available for those interested in earning Bachelor's, Master's and doctoral degrees. According to the 2050 State Programme on Education, in 2010, the Bolashak Scholarship Programme was redesigned so that, "100% of the Bolashak Programme fellows will study in Master's and Ph.D. degree programmes or will participate in research internships for the duration of one term to one academic year[82]".

Since 1993, more than 7 000 Kazakhstani students have received the Bolashak Scholarship. During 1994-2010, nearly 3 000 students successfully completed their Bachelor's, Master's and Ph.D. degrees, and a third of them graduated from U.S. universities such as Harvard, Columbia, Stanford and Yale.[83] The most popular countries for study are the United Kingdom (42%), United States (24%), Russia (7%) and other countries (27%) (MES, 2012b).

Nazarbayev University

Nazarbayev University (NU), formerly a non-profit joint stock company, was reorganised in 2010 into an independent, autonomous entity by the "Decree of the Government" of the Republic of Kazakhstan. Nazarbayev University aspires to be one of the top ranked universities worldwide

82 Embassy of the Republic of Kazakhstan to the USA, Bolashak Program http://www.kazakhembus.com/page/bolashak-program

83 http://www.kazakhembus.com/page/bolashak-program

in linking innovation, research and teaching, as well as and serving as a model for other research universities in the country. To achieve this ambitious goal, a set of unique partnerships was established with leading universities around the world. These collaborative partners were selected based on excellence in various disciplines of academic study (see Appendix P) for partners for each school at the NU).

While Nazarbayev University is the national model for research and partnerships, other Kazakh universities are also engaged in international co-operation to enhance their research capacity. In 2011, approximately 1 717 foreign scientists and consultants from leading universities around the world partnered with Kazakh universities (MES, 2012b).

Improved research productivity is demonstrated by evidence that the proportion of universities participating in research projects increased from 33% in 2010 to 67% in 2012. The number of international publications tripled in recent years increasing from 305 in 2005 to 1 023 in 2012 (MES, 2013).

The most recent data show that in 2011, there were 1 337 Ph.D. students enroled in Kazakh universities, with the greatest concentration majoring in social sciences, education, economics and business and engineering and technology, while substantially fewer were enroled in agricultural science and veterinary medicine (MES, 2012b).

Problems that need to be addressed

A potential barrier to the national goals for integrating research, innovation and education is the bifurcation of the research enterprise between HEIs and research institutes. While additional funding this past year flowed to HEIs, a larger proportion of the research budgets remain in the research institutes, sponsored by non-education ministries. Limited resources result in research funds spread across many organisations, thereby potentially compromising the quality of research overall.

Another barrier to progress discussed with the project team is the heavy teaching workloads of academic staff that can limit time for research, as well as time to foster linkages between education and research, in order to realise the research-innovation-education linkages as described in the National Report (MES, 2012b).

Other problems that should be addressed include:

- inadequate integration of education, research and industry (role of research universities, innovation clusters);
- lack of a commercialisation infrastructure for researchers (institutions, training innovation managers, cultivating entrepreneurship culture);
- the need to continue to train, attract, retain best research minds (repatriation of Kazakh researchers from abroad, inviting international researchers, attracting young Bolashak scholars, international collaborations);
- the low level of private demand for R&D in the country (development of start-ups, SMEs, support for innovation activities);
- the lack of an effective national innovation system (better co-ordination among the government agencies responsible for funding research and innovation in the country).

PriorityFour: To build the institutional capacity for a diverse, globally competitive higher education system.

National priorities and international evidence

Over the past quarter century, all the world's most competitive economies have moved from "elite" higher education systems focused on developing a limited number of globally competitive research universities, serving only the most qualified students, to mass higher education systems encompassing institutions with a wide range of missions designed to serve the diversity of the nation's population and national and regional priorities (OECD, 2008a, p. 96-98). Most competitive economies are seeking to develop world-class research universities but at the same time they are developing the capacity of the higher education system as a whole to serve students and other needs that a research university cannot serve.

A central element of most national higher education strategies, therefore, is to foster differentiation of institutional mission in terms of:

- student selection and student populations to be served;
- degrees awarded;
- programmes offered;
- type of research;
- price;
- extent of engagement with regions and surrounding communities (OECD, 2008a, p.145).

Many of the competitive economies have also developed strong post-secondary non-university technical education systems (at the level of ISCED 5B) designed to provide affordable access to students within a region and to serve the demands of the labour market and regional economic development.

Another important element of national strategies are structures and finance policies designed to reinforce mission differentiation: to maintain a balance between the need for a limited number of globally competitive research universities granting degrees at the post-graduate level of research-intensive doctorates and the need for institutions focused primarily on teaching at the undergraduate level and preparation of specialists at the Bachelor's and Master's degree levels. National strategies seek to curb the universal pressures for "mission drift" of HEIs toward the perceived prestige of the academic and research university missions. "Mission drift" can also occur from a technical and professional mission to an academic mission, from a teaching mission to a research-intensive mission and from granting primarily undergraduate and professional degrees, to granting research-intensive doctorates. The extraordinary costs of developing globally competitive research universities require that nations invest strategically in only a limited number of these institutions. If the system as a whole is allowed to drift toward the research and doctoral-level mission, not only is the capacity of the system to serve the nation's population diminished but also the costs of the system become prohibitive for the state and students.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Kazakhstan is developing a more differentiated higher education system, as demonstrated by the actions summarised above. The clearest element of national strategy is to develop world-class research universities on the model of Nazarbayev University that are recognised at the highest levels of global

rankings (MES, 2012b). One issue that Kazakhstan must address is the extent to which it can invest in globally competitive research universities. Table 26 below shows the number of universities by country – and also shows the population of each country – in the Shanghai Rankings, one of the most competitive research ranking systems. These rankings are important for the diverse range of criteria they include and for their recognition by prestigious research universities. Among the criteria included in these rankings are: the quality of education, as measured by Nobel Prizes and Fields Medals, highly cited researchers in broad subject categories, publications and indexed citations in Social Science Index.[84]

It is noteworthy that many countries have limited the number of research-intensive institutions to ensure the high quality of the research enterprise. As Kazakhstan increases its research productivity, choices about how to invest appropriately must be made.

Table 26. Rankings of World Universities (Shanghai Rankings)

Comparator Country	Number of Universities in the Top 100 of the Academic Ranking of World Universities	Population 2012
Australia	5	22 683 600
Canada	3	34 880 491
Denmark	2	5 590 478
Estonia	0	1 339 396
Finland	1	5 414 293
Ireland	0	4 588 798
Japan	4	127 561 489
Kazakhstan	0	16 797 459
Korea, Rep.	0	50 004 000
United Kingdom	9	63 227 526
USA	53	313 914 040

Through the new classification of institutions, Kazakhstan is promoting the differentiation of institutions according to the scope and types of academic programmes and the level of research (MES, 2012b, pp. 150-151). The Kazakhstan Office of Statistics offers the following definition of the various types of tertiary institutions: (NCESA , 2013)

- Academy: higher educational institution, implementing educational programmes of higher and postgraduate education in one or two groups of professions;
- Higher education institution (HEI): higher education institution (institute, academy, university), implementing educational programmes of higher and post-graduate education and carrying out research;
- Institute: higher education institution delivering educational curricula of higher education;
- University: higher education institution delivering educational curricula of higher education, Master's degree programmes and doctoral programmes in three or more groups of specialties, performing basic and applied researches, being a scientific and methodical center;
- National higher education institution: higher educational institution, which is a leading scientific and methodological center of the country, which has special status.

84 Academic Ranking of World Universities, http://www.arwu.org/ARWU2010.

Data available to the project team do not provide information on the distribution of current institutions according to these categories, but data from 2011 indicates that of the 149 institutions in that year there were 90 universities, 26 academies and 33 institutes (MES, 2012b).

As described earlier in this chapter, the MES is optimising the higher education network by reducing the number of private universities from 66 to 39 and some public institutions may be consolidated. Kazakhstan is also further differentiating the university sector between universities that will concentrate on a globally competitive research mission and those that, while retaining research as an element of their missions, will focus on more specialised research and preparation of specialists in particular fields important to the national or regional economy such as engineering and technology (MES, 2012b).

As noted above, Kazakhstan is also strengthening the colleges within the TVE sector through the implementation of seven "Kasipkor" Colleges, but it was not clear to the project team whether these would be recognised as being at the tertiary education level of ISCED 5 B.

Problems that need to be addressed

Kazakhstan is developing a more differentiated higher education system, as demonstrated by the actions summarised above. The clearest element of national strategy is to develop world-class research universities based on the model of Nazarbayev University that are recognised at the highest levels of global rankings (MES, 2012b, p.152). As indicated in priority three above, developing a limited number of such globally competitive universities is a critical element of the national strategy. What is not clear to the project team, however, is whether Kazakhstan has a strategy to develop and sustain other components of the kind of robust higher education system needed to achieve the President's 2050 vision. Such a system includes a network of institutions with diverse missions, each performing at the highest international standards of quality and performance appropriate for its mission. The phrase "appropriate for mission" means that the definition of quality and performance should be different for different missions. All elements of the system must be high-performing, from tertiary-level technical colleges to pedagogical universities to regional teaching universities. The new classification of institutions cited above is an important step toward such a differentiated system. The major issues that Kazakhstan must address are whether the policies of finance, leadership and governance are in place to develop and sustain the capacity for such a high-performing, diverse higher education system. These issues are addressed in priorities five and six.

Priority Five: To establish a financing framework for a competitive, sustainable higher education system.

National priorities and international evidence

Funding is one of the primary tools available to governments to ensure that their institutions of higher education contribute to national goals in ways and at levels consistent with stated needs. Given the stated national goals, this means that HEIs must produce high quality college graduates in sufficient numbers to meet the needs of the economy and of society. It also means that these institutions must engage in research in quantities and of a quality that allows results to drive the innovation necessary to the future of the country. It should be noted that the use of the term "quality" in this context refers to both quality as judged in an international academic setting and "fitness for purpose" in meeting the needs of the country.

Implied in this set of expectations placed on institutions is an assumption that the institutions have the necessary capacity to respond to these challenges and that they will use the resources efficiently and effectively to pursue national (not solely institutional) goals. At the national level, policy makers must be concerned with:

- overall funding levels for tertiary education: are the funds being allocated adequate to the task that has been assigned?
- allocation of those funds in ways that are consistent with stated public purposes: are the funds distributed in ways that create incentives for institutions to produce desired results?

The project team's ability to make sound analyses of the situation in Kazakhstan with regard to these topics has been seriously compromised by the inability to acquire even the most fundamental data about the overall stock and flows of funds into higher education in the country. From the meagre data that could be found (or estimated), the team was able to make observations about both of the key policy issues noted above.

Public funding for tertiary education

Government spending for tertiary education is exceptionally low (see Table 27).

Table 27. Total expenditure on tertiary educational institutions and administration from public sources as percentage of GDP, 2009

	GDP per capita (current prices) 2009 $	Total expenditure on educational institutions and administration as a % of GDP. Public sources. Tertiary
Malaysia	7 278	2.0
Finland	44 838	1.8
Denmark	56 227	1.8
Sweden	43 640	1.5
Canada	39 659	1.5
Ireland	50 246	1.3
Norway	78 457	1.3
Belgium	43 843	1.3
Austria	45 859	1.3
France	40 488	1.2
Switzerland	65 790	1.2
Costa Rica	6 386	1.2
Estonia	14 264	1.2
Malta	19 564	1.2
Netherlands	48 174	1.2
Argentina	7 674	1.1
Romania	7 651	1.1

	GDP per capita (current prices) 2009 $	Total expenditure on educational institutions and administration as a % of GDP. Public sources. Tertiary
New Zealand	26 990	1.1
Slovenia	24 051	1.1
Germany	40 275	1.1
Poland	11 295	1.1
Spain	31 714	1.0
United States of America	45 305	1.0
Czech Republic	18 806	1.0
Mexico	7 596	1.0
Hungary	12 635	1.0
Lithuania	11 034	1.0
Israel	26 032	0.9
Portugal	22 019	0.9
Bulgaria	6 403	0.9
Brazil	8 373	0.8
Thailand	3 979	0.8
Australia	42 404	0.8
Latvia	11 476	0.7
Korea, Rep	16 959	0.7
Italy	35 073	0.7
Slovakia	16 100	0.6
Peru	4 387	0.4
Kazakhstan	7 165	0.4
United Kingdom	35 331	0.4
Philippines	1 832	0.3
Chile	10 120	0.3

Sources: Education Unesco, Institute of Statistics, Beyond 20/20 WDS, Table 19: Finance Indicators (http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx) GDP per capita World Bank EdStats database (http://go.worldbank.org/47P3PLE940)

These data show that Kazakhstan spends considerably less of its GDP on tertiary education than most other countries, including those with generally similar GDP per capita.

But relying solely on percentage of GDP as a marker can be deceiving; the overall size of the economy (GDP) and the number of students being served can, at least partially, invalidate the comparison. The credibility of the number can be checked by triangulating; using the calculation of expenditure per student as the basis of comparison. These data reveal the same picture.

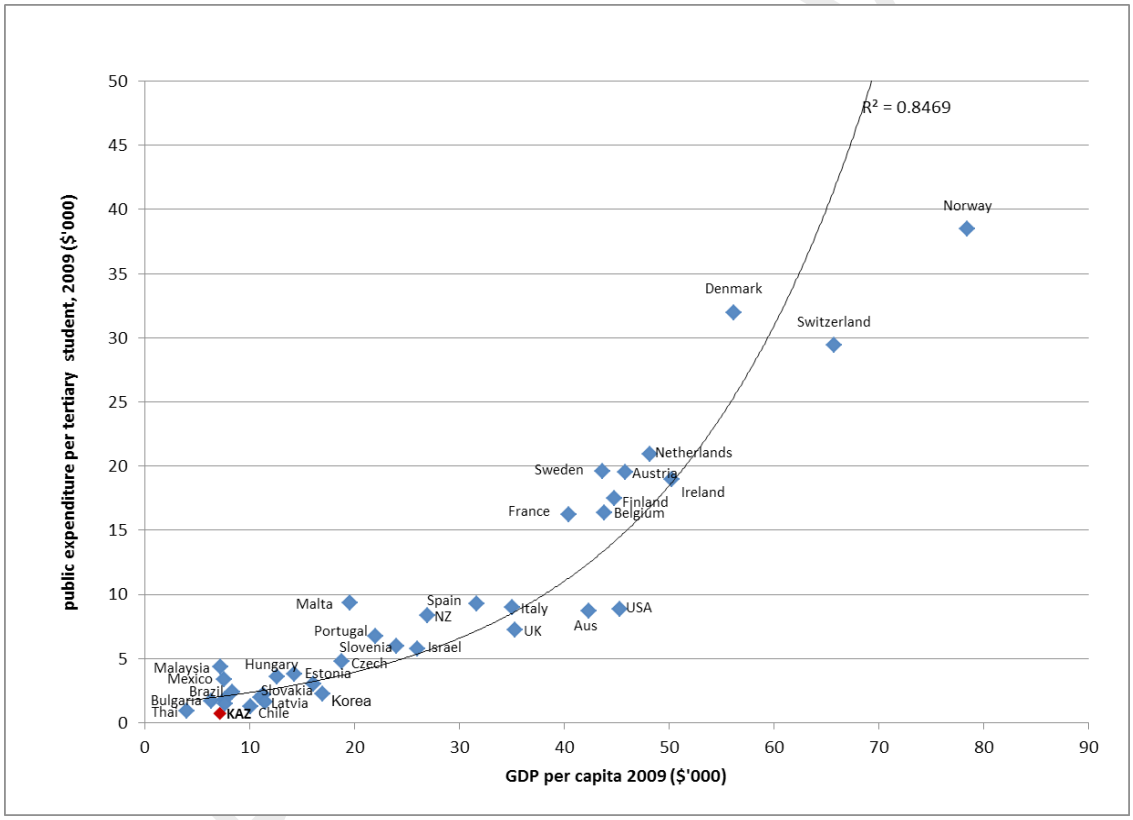
Table 28. Public expenditure per student in tertiary education, 2009

Country	GDP per capita (current prices) 2009 $	pub exp per student (current prices) 2009 $
Norway	78 457	38 486
Denmark	56 227	31 982
Switzerland	65 790	29 395
Netherlands	48 174	20 913
Sweden	43 640	19 588
Austria	45 859	19 492
Ireland	50 246	18 933
Finland	44 838	17 452
Belgium	43 843	16 392
France	40 488	16 184
Malta	19 564	9 308
Spain	31 714	9 250
Italy	35 073	9 002
United States of America	45 305	8 859
Australia	42 404	8 711
New Zealand	26 990	8 358
United Kingdom	35 331	7 226
Portugal	22 019	6 736
Slovenia	24 051	5 932
Israel	26 032	5 760
Czech Republic	18 806	4 792
Malaysia	7 278	4 365
Estonia	14 264	3 775
Hungary	12 635	3 596
Mexico	7 596	3 340
Slovakia	16 100	3 003
Brazil	8 373	2 378
Korea, Rep	16 959	2 232
Poland	11 295	2 145
Lithuania	11 034	1 996
Romania	7 651	1 795
Bulgaria	6 403	1 678

Country	GDP per capita (current prices) 2009 $	pub exp per student (current prices) 2009 $
Latvia	11 476	1 624
Argentina	7 674	1 463
Chile	10 120	1 291
Thailand	3 979	901
Kazakhstan	7 165	730

Figure 5 shows a least-squares trend line fitted to the data in Table 28. The low expenditure per student partially reflects the fact that Kazakhstan, which is classified by the World Bank as an "upper middle income" country, is relatively poor compared with OECD countries.

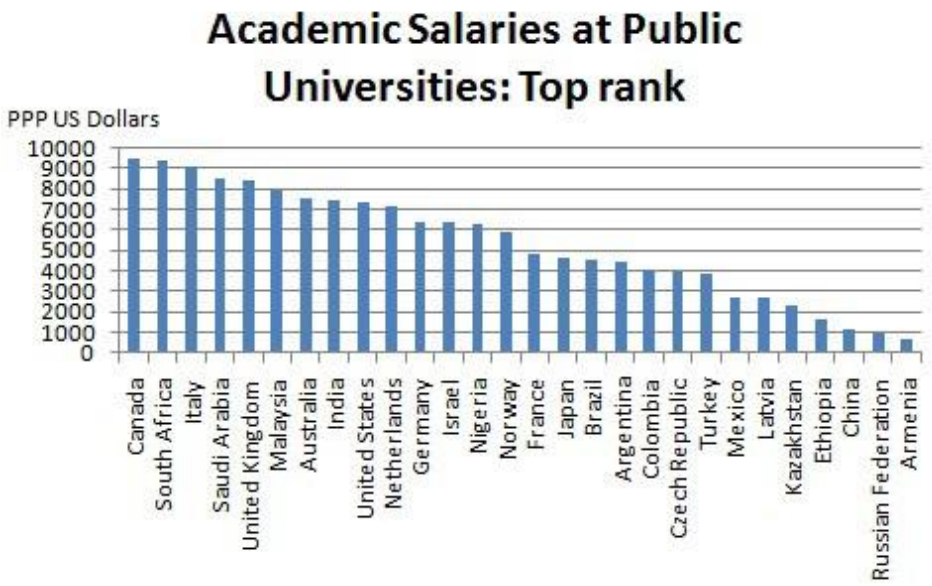
Figure 5. Public expenditure per student in tertiary education, 2009

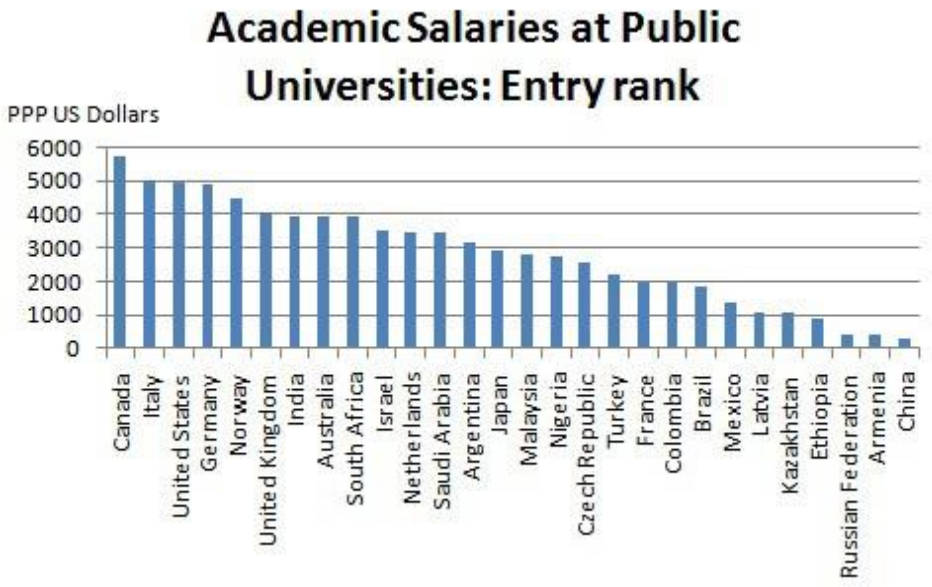


Among this collection of countries, Kazakhstan is at the lower end of the curve; it is well below the line.

In making an international comparison of expenditures, it also must be noted that costs may be relatively low in Kazakhstan, reflecting academic salaries that are relatively low.

Figure 6. Academic Salaries





Source: is based on a project whose results are reported in: Paying the Professoriate, A Global Comparison of Compensation and Contracts, Edited by Philip Altbach, Liz Reisberg, Maria Yudkevich, Gregory Androushchak, Iván Pacheco; 3rd April 2012 by Routledge.

Excel data can be found in http://acarem.hse.ru/t2g2

This is true not only for the absolute level but also if measured in terms of per capita income.

Table 29. Ratio of monthly academic salaries at public universities to GDP per capita, by academic rank

Country	Year	Top rank	Rank 2	Rank 3	Rank 4	Rank 5
Nigeria	2009	262%	217%	184%	116%	
Ethiopia	2008	238%	207%	179%	154%	130%
India	2010	207%	190%	110%		
South Africa	2008	107%	88%	74%	60%	45%
Brazil	2010	43%	40%	30%	20%	18%
Colombia	2008	47%	35%	27%	24%	23%
Argentina	2010	32%	30%	25%	23%	
Malaysia	2008	56%	29%	27%	20%	
Turkey	May 2010	36%	26%	22%	19%	20%
Saudi Arabia	2008	29%	25%	20%	15%	12%
Italy	2009	30%	22%	16%		
Mexico	2009	21%	18%	16%	14%	12%
Canada	2007/08 academic year	22%	17%	14%	13%	
Israel	2010	22%	17%	15%	12%	
United Kingdom	2006/07 academic year	22%	16%	14%	11%	
Germany	2008	17%	14%	12%	13%	13%
Netherlands	2008	15%	13%	10%	8%	
United States	2008/09 academic year	16%	13%	11%		
Czech Republic	2008	15%	12%	8%	6%	6%
Latvia	2009/10 academic year	16%	12%	10%	8%	6%
Armenia	2009/10 academic year	12%	11%	9%	7%	
China	2008	15%	11%	10%	4%	
France	2009	14%	11%	6%		
Kazakhstan	May 2010	16%	11%	8%	7%	
Japan	2007	13%	10%	9%	8%	8%
Norway	2008	9%	7%	8%	7%	
Russian Federation	2008	5%	4%	3%	2%	
Australia	2008	16%		13%	11%	8%

Source: ibid, http://acarem.hse.ru/t2g2

Low salaries in relation to what can be earned elsewhere may have an adverse effect on incentives to teach at a university and hence on the quality of education that can be offered. It may also make it more difficult to eliminate corruption, although the fact that student selection is performed by a national exam reduces opportunities for academic corruption.

Using the data that could be located, it is possible to make the following observations:

- Kazakhstan spends relatively little on tertiary education as measured either as a percentage of GDP or on the basis of expenditures per student.
- The output of the higher education system in terms of both degree production and research will have to increase to meet the needs of the country and its citizens.
- There are several indicators that suggest that the level of funding is insufficient to produce the current level of degree outputs at a high quality level, indicators such as salary levels for faculty are so low as to invite corruption and consistent feedback from employers that students are coming out of college ill-prepared for the working world.

Taken together these observations lead the project team to conclude that Kazakhstan cannot provide enough of its citizens with high standard of education or conduct enough research to yield needed levels of innovation without increasing its level of investment in higher education.

Allocation of available resources

The vast majority of public money devoted to higher education is allocated through state grants – a merit-based grant (essentially a voucher) provided to those students who get the highest scores on the UNT. This allocation is consistent with the country's reliance on market mechanisms to distribute resources to HEIs. Once in receipt of a grant, the student has complete freedom to enrol in any institution of his/her choice. This policy will change in 2015 to constrain student choice to only those institutions that have been accredited – a major incentive for institutions to participate in the accreditation process. The government's only guidance in this process is through the designation of a certain number of these grants to be awarded to students interested in specific disciplines defined as being of state interest. Student choice in this instance can be constrained by capacity limitations in those fields in the most desirable institutions, but the institutions rather than government impose these limitations. Similarly certain numbers of grants are set aside for use by students from specific sub-populations such as orphans, students from rural areas, etc.

The data in the following table shows the number of students in higher education by broad type of institution.

Table 30. The number of students in higher education by broad type of institution

Types of financing	Number of Students by Type of Institution							
	State Ownership		Private Ownership		Ownership of other Countries		Total	
	2011	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**
Total Students	311 333	280 422	311 817	283 417	6 357	7 852	629 507	571 691
With the use of educational grants	110 620	107 724	22 884	23 668	532	527	134 036	131 919

Types of financing	Number of Students by Type of Institution							
	State Ownership		Private Ownership		Ownership of other Countries		Total	
	2011	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**
With the use of other forms of state educational order	10 686	11 914	401	403	94	73	11 181	12 390
With the use of purchase of educational services	190 027	160 784	288 532	259 346	5 731	7 252	484 290	427 382
Per cent of Total								
With the use of educational grants	36%	38%	7%	8%	8%	7%	21%	23%
With the use of other forms of state educational order	3%	4%	0%	0%	1%	1%	2%	2%
With the use of purchase of educational services	61%	57%	93%	92%	90%	92%	77%	75%

Source: Kazakhstan National Statistics on Education 2013, Table 2.6.11.

This data clearly makes two points. First, only a quarter of the enroled students receive state grants; the other 75% must rely on their own resources to pay their way through college. Second, the students who receive the grants overwhelmingly choose state-owned institutions. What this data does not show are the specific types of state-owned institutions that attract these students.

State-supported students are likely to prefer disproportionately the national and international institutions. Furthermore, the allocation of public expenditure is at present unequal, since an allocation based on pure academic merit tends to favour richer families who do better at the UNT and are then likely to attend better schools and can afford private tuition as discussed in as discussed above.

These national and international institutions charge higher fees so it cannot be assumed that expenditure per student is equivalent for students who pay the cost of their education from private sources. In addition, the state also offers some capital grants to selected institutions but the team was ubable to learn the amounts or destination of these grants. It seems probable, however, that considerably more than half of total expenditure is provided by private sources.

It should be noted that Kazakhstan is not the only country that relies heavily on private funding sources (tuition) to support its HEIs. The table below shows that the USA, Japan, and Korea all depend on private payments to provide a substantial portion of the funding for their HEIs.

In Korea, for example, which has very good overall results, the state provides only about a quarter of total resources (Table 31).

Table 31. Public expenditure as % of total tertiary expenditure, 2009

Malta	100.0	Ireland	82.0	Canada	62.7
Switzerland	100.0	Spain	79.1	Lithuania	62.5
Finland	95.8	Czech Republic	78.4	Bulgaria	60.6
Denmark	93.0	Estonia	75.6	Israel	58.2
Austria	87.7	Netherlands	70.5	Latvia	55.2
Belgium	87.6	New Zealand	70.4	Australia	45.4
Sweden	86.2	Poland	69.0	USA	38.1
Argentina	84.1	Mexico	68.7	Peru	33.8
Germany	83.0	Italy	67.3	UK	28.4
Slovenia	82.7	Portugal	67.2	Korea, Rep	26.1
France	82.2	Slovakia	66.6	Chile	14.6

Source: UNESCO database

The way in which Kazakhstan distributed its public resources puts it at odds with not only practices in other countries, but with the requirements associated with its stated public goals. It must be noted that the country's approach to funding its research interests differs substantially from its approach to funding the education of its citizens. In the case of research, the government allocates funds for both creating research capacity in certain institutions and for providing incentives to institutions to conduct research on high priority issues – it invests in both capacity building and capacity utilisation. Through these mechanisms government provides guidance regarding its innovation agenda without being overly intrusive.

There are no such links between ends and means with regard to efforts to create a more educated population. With very few exceptions (Nazarbeyev University being the principle one), Kazakhstan does not utilise its resources to create needed capacity. As a result, it does not make a conscious effort to create and sustain types of institutions that are appropriate to the needs of different regions of the country. It is making strides to reduce the number of institutions through the optimisation process, but the project team's understanding is this is primarily an effort to reduce unnecessary duplication rather than a deliberate effort to shape the size, nature, and location of the public system of higher education.

This dichotomy between practices as they deal with research versus those dealing with instruction point to a philosophic inconsistency. With regard to research, the government essentially accepts the notion of a public benefit – the objective is explicitly to serve a national interest. With regard to instruction, however, the country behaves as if all of the benefits are private; they accrue to the individual but not society at large.

The public benefits of higher education are well-known and well-documented (see, for example, the series of College Board publications entitled Education Pays). The benefits extend beyond economic rewards; greater levels of education are correlated with better health, reduced involvement in crime, and higher levels of social integration, for example. Other countries recognise this relationship and directly invest in higher education because of the promise of these public benefits. For this reason

they take steps to increase the education attainment levels of their population, a goal not directly tied to specific labour force requirements.

To achieve these goals, other countries:

- directly contribute to the general operating funds of their public institutions. This funding is designed both to ensure institutional capacity of the types and in the places required to respond to both individual and societal needs and to keep higher education affordable to individuals.
- provide scholarships and other forms of financial assistance to students to remove economic barriers to college access and completion.

Kazakhstan is just starting to move away from its history of not providing support to institutions for general operations. The government is funding the general operation of Nazarbayev University as an example of a different model. However, the level of support provided to NU would not be sustainable if applied to all public institutions. Some blended model of public and student support for state-owned institutions is clearly called for.

The project team notes the inconsistencies between government's approach to funding research versus undergraduate education and between the national goals and the way that funds are allocated in pursuit of those goals. These observations lead the team to conclude that the country's resource allocation model for funding higher education should be reconsidered.

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

In the year immediately following independence in 1991, Kazakhstan embraced some features of a market economy and enabled a major expansion of private institutions to respond to the rapidly increasing demand for higher education. This early growth was funded primarily through student fees. The national development plans since the mid-2000s reflect a growing recognition that reliance primarily on privatisation and market forces would not necessarily lead to a higher education system aligned with national goals.

The number of institutions is being systematically reduced through the optimisation process. This process provides a vehicle for not just creating a more efficient system but one that has the educational capacity aligned with the needs of the country.

The country has taken another step away from sole reliance on student fees as the mechanism for funding higher education in creating and funding Nazarbayev University. By creating a new university the country is not only adding capacity but also establishing a new model of both governance and finance. The task is bringing this new model to scale.

The number of state grants being awarded each year is increasing slowly. However, the large majority of students must still use their own resources to pay for college. This makes the issue of college affordability a major policy consideration for the country – if students cannot afford (inevitably increasing) tuition rates, the country's attainment goals will be in jeopardy.

Kazakhstan has taken modest steps to address the affordability for the majority of students who do not receive state grants.

The country has established the National Education Storage System (NESS), a programme that enables families to set aside funds in anticipation of college expenses. The programme will allow the opportunity for every Kazakh citizen to accumulate money systematically for education. Similar to the 529 plan in the USA, the NESS programme allows people to accumulate funds for higher

education with some tax benefits. Kazakhstan has also created a student loan programme. While these two programmes provide ways to help families with the terms of payment for college, they do nothing to reduce the overall cost of attendance. As a consequence they do not materially impact affordability.

As was noted earlier, the Government of Kazakhstan is making major investments in R&D, with an increasing share going to university-based research. It should be noted that, in this particular area, the government provides resources for both capacity-building (e.g., acquisition of equipment and other necessary elements of research infrastructure) as well as for the utilisation of that capacity to actually conduct research. This approach to funding research is sound and should be commended.

PROBLEMS THAT NEED TO BE ADDRESSED

The problems that remain to be addressed mirror the two problems identified earlier: the overall level of funding and the methods by which funds that are made available are distributed. The first issue is determined by levels of revenue and government decisions with regard to competing priorities. Regardless of funding levels, however, it is important that allocation mechanisms be structured in such a way that they:

- ensure creation and maintenance of the necessary institutional capacity – sustaining institutions of different types located as appropriate in different locations throughout the country. Only at Nazarbayev University is the government directly supporting general institutional operations. The model being used at Nazarbayev University cannot be sustained for a broader set of institutions.
- maintain affordability of education for large numbers of students who, under current practice, will be expected to fully finance their own education. The number of college graduates the economy will need far exceeds the number supported by state grants. Those least equipped to compete for state grants are students from rural areas and lower income students (students who attend schools with few highly qualified teachers, less access to technology, and other deficiencies). The current funding mechanism is heavily weighted against such students.

The current approach to funding higher education through state grants to students, as this programme is currently configured, does not align well with these two requirements. Modifications to the funding model should be considered.

Concluding observations:

- Kazakhstan spends relatively little on tertiary education as measured either as a percentage of GDP or on the basis of expenditures per student.
- The output of the higher education system in terms of both degree production and research will have to increase to meet the needs of the country and its citizens.
- Consistent feedback from employers that students are coming out of college ill-prepared for the working world suggests that the level of funding is insufficient to produce the current level of graduates at a high level of quality.
- In sum, these observations lead the project team to conclude that Kazakhstan cannot expect to educate enough of its citizens to high standards or conduct enough research to yield needed levels of innovation without its investment in higher education.
- The project team notes the inconsistencies between government's approach to funding research versus undergraduate education and between the national goals and the way that funds are allocated in pursuit of those goals. These observations lead the team to conclude that the country's resource allocation model for funding higher education should be reconsidered.

Priority Six: To establish a leadership and governance framework at both the institutional and national levels for a competitive system.

National priorities and international evidence

The demands of the global knowledge economy and the shift from "elite" to mass higher education systems have led to fundamental redesign of national and institutional leadership and governing structures from centralised top-down control and regulation toward decentralisation and deregulation within the framework of nationwide leadership and steering "at a distance" through finance policy and new modes of performance-based accountability (OECD, 2008b). Table 32 illustrates several of these changes.

Table 32. Changes in focus of national-level tertiary education roles

From:	To:
Planning for the higher education sector isolated from national or state priorities	Strategic planning linking higher education to the future competitiveness of the country or state.
Centralised control and regulation and limited institutional autonomy	Steering "at a distance," emphasising decentralised institutional governance and using finance policy (e.g., performance funding) to ensure that institutions respond to public priorities.
Subsidy of public institutions Resource allocation based on inputs and cost-reimbursement	Funding of institutions based on outcomes. Resource allocation based on performance. Subsidy of students through student grants.
Quality assurance related primarily to public institutions (mainly in-country/ state)	Quality assurance related to multiple public and providers (public and private, cross-border, open/ distance learning, etc.).
Accountability based on inputs	Accountability based on outcomes/performance and evidence of cost-effective and efficient utilisation of resources.

Source: Adapted from OECD (2006), "A Conceptual and Analytic Framework for Review of National Regulatory Policies and Practices in Higher Education," paper prepared for discussion of OECD's Education Committee [EDU/EC (2006)3], OECD, Paris.

These developments require fundamental changes in the capacity for leadership at both the national and institutional levels.

Certain characteristics of a country's tertiary education governance structure and regulatory environment are highly correlated with the system's performance. A recent background paper prepared for the World Bank initiative, "Systems Assessment for Better Education Results (SABER)"[85], summarises eight policy goals that lay the foundation for a clear and coherent governance structure:

- Clear Vision for Tertiary Education: The country or government has a vision and plan for the tertiary education sector, and a willingness to translate its vision into a concrete action plan.

85 The World Bank (2012). *SABER – Tertiary Education Governance*, a background paper for the SABER tertiary education domain. Data collection and assessment tool. Systems Assessment for Better Education Results (SABER) is designed to assess existing education policies of participating countries in order to enable comparisons between them and learning of best practices.

- Appropriate Regulatory Framework: The tertiary education system is governed by an appropriate regulatory framework including for private providers.
- Capacity of the Tertiary Education Authority (TEA): The TEA has staff and resources to implement reforms, and to guide, support and monitor institutions.
- Leadership, Management and Organisational Autonomy: The regulatory framework allows for sufficient organisational autonomy. This means that the TEA has an appropriate policy on the role and functions of the boards of HEIs as well as for the selection of their leadership, and the respective responsibilities of the leadership and the board.
- Sufficient Institutional Autonomy: The regulatory framework allows for sufficient financial, staffing and academic autonomy in institutions.
- Presence of performance-based and equity focused funding: Funding mechanism is performance-based, transparent, and promotes equity in student enrolment.
- Checks on Quality and Relevance: The TEA has an independent quality assurance and accreditation agency for both public and private institutions.
- Standards of Accountability: Institutions are held to specific standards of transparency around financial health, fraud, student engagement, and employment of graduates.

An important point from this list of policy goals is the need for both institutional autonomy and public accountability. While institutional autonomy is important, so is national-level capacity for providing leadership and oversight for the tertiary sector as a whole, utilising the key policy tools of policy leadership, finance, regulation, and accountability. For example, each of the comparator countries for this report grants its public HEIs a high degree of autonomy on the key dimensions of organisation, finance, staffing, and academic policy. However, the level of autonomy on each of these dimensions varies depending on each country's unique history and governmental structure (Estermann et al., 2011; OECD, 2008b, p.126).

The establishment of institutional-level governing boards is a clear trend across both developed and developing countries; however, the powers and composition of these boards varies greatly, as illustrated by the differences among EU countries. Some boards have broad authority to take strategic decisions, appoint the institutional chief executive, and other key governing functions. Other boards play primarily an advisory role with limited authority to make decisions on institutional leadership and policy directions. The composition of boards varies from those composed primarily of internal university representatives, to those with a majority of external members.

As beneficial as institutional-level governing boards may be for autonomous institutions, the experience of the UK and USA, both of which have long traditions of local boards, is that development and training of board members is a prerequisite for effective governance. The UK Committee of University Chairs (CUC) was formed in 1988 in an effort to improve governing board performance. The purposes of the CUC, in part, include:

- to support the HE sector in developing the highest standards of governance appropriate within a sector comprised of autonomous and independent institutions, serving a multiplicity of stakeholders and vital to the nation's prosperity;
- to assist governing bodies to fulfil their responsibilities particularly in relation to institutional strategy and performance;
- to promote best practice in university governance and enable such best practice and related topics to be examined under its auspices through seminars, publications, conferences and advice;

- to work with individual governors to develop their knowledge and skills, as these relate to the good governance of their institutions, through e.g. governor development programmes, newsletters.[86]

In the USA, the Association of Governing Boards for Universities and Colleges (AGB), an association of the governing boards of public and private not-for-profit universities, performs functions similar to the CUC.

More than 75% of the students in the USA attend public institutions within multi-campus systems headed by a single governing board that do not have campus-level boards. An ongoing debate in the USA centers on whether some larger research university campuses currently within systems (e.g., the University of California Berkeley or the University of Wisconsin Madison) should be split away from the larger systems and established with their own governing boards (McGuinness, 2013). An important question in these debates concerns the criteria that should be used to determine whether a university should have its own governing board either within or outside the larger university system. The debate in Wisconsin, for example, suggested that a large campus such as the University of Wisconsin Madison has the leadership capacity to assume this added governing authority, while the smaller campuses that are focused primarily on a teaching and regional service mission do not have such capacity. The criteria suggested for making these distinctions related issues such as the ability to attract and retain qualified board members, leadership and staffing capacity at the institution, and the impact on economies-of-scale within the system (President's Advisory Committee on the Roles of UW System Administration, 2011).

As noted earlier, the move to more autonomous institutions requires fundamental changes in the qualifications of institutional leaders: rectors, presidents, and senior institutional administrators. In countries with a heritage of highly centralised controls, institutional leaders were primarily administrative agents of a central ministry and important institutional functions such as planning; academic affairs, budgeting, and human resource management were the responsibility of ministry officials. The experience of countries that have made the shift to more autonomous institutions underscores the need for significant investment in professional development and training of rectors and presidents as well as senior institutional leadership (OECD, 2008b, pp. 28-29).

The move to more autonomous institutions also requires changes in internal institutional governance, especially the roles and responsibilities of academic councils and senates and the participation of students in institutional governance. Again, the experience of other countries indicates that major investment in professional development for academic leaders and staff is an essential prerequisite to successful implementation of new governance models (OECD, 2008b, pp. 28-29).

Even while granting institutions more autonomy, all the comparator countries have established national level (or in the case of Canada and the United States, state or provincial level) entities that carry out the responsibilities of a "tertiary education authority" as identified in the list of goals above. These entities are responsible for establishing strategic direction, allocating public funding, and overseeing and regulating the tertiary education sector. In some cases, these functions are carried out by units within a comprehensive ministry such as the Ministry of Education, Science and Technology in the Republic of Korea.

However, an increasing number of countries have established independent tertiary education authorities responsible for broad leadership and oversight functions or, in some cases, for specific functions such as quality assurance and accreditation. Examples within the EU of independent entities

86 http://www2.bcu.ac.uk/cuc/about-the-cuc

with broad policy leadership and oversight responsibilities include the Higher Education Funding Council of England (HEFCE)[87] and the Higher Education Authority (HEA) in Ireland[88].

In the United States, the primary responsibility for higher education policy is at the state level. While public institutions in the USA have a degree of autonomy, the extent of that autonomy varies from state to state. Most states have state-level entities responsible for providing policy leadership, co-ordination and/or governance of the higher education system. Examples of high-performing entities include co-ordinating agencies such as the Kentucky Council on Postsecondary Education[89] and the Texas Higher Education Coordinating Board[90] and state-wide university systems such as the University System of Georgia[91] and the University of Wisconsin System[92].

Even in countries with highly developed higher education systems, these changes require fundamentally different competencies in the staff of tertiary education agencies. Within the European Union, higher expectations from EU frameworks, implementation of the Bologna process, new performance-based funding schemes, and other trends require different competencies at the ministerial level. A report of the European Universities Associations (EUA) notes in the 2011 survey of institutional autonomy, "Some ministries were viewed as lacking a long-term vision for the steering of universities. The ministries were similarly inexperienced in using the new steering mechanisms, which led to either a non-indented outcome (in particular with funding mechanisms) or to a too short phase of adaptation to the new circumstances." (Estermann, 2011).

This a particular challenge in the USA where state co-ordinating entities formed for an earlier time are finding it difficult to make the transition to new roles (NCPPHE, 2005; McGuinness&Novak, 2011).

ACTIONS ALREADY TAKEN OR ABOUT TO BE TAKEN

Kazakhstan has taken important steps since the 2007 OECD/World Bank review both to increase institutional autonomy as well as to reform the role of the MES and national-level entities in the direction of international best practice.

Actions to increase institutional autonomy include:

- the establishment of Nazarbayez University (NU) as a new kind of legal entity (neither state nor private for profit); with significant autonomy from state regulatory controls. Prior to the establishment of Nazarbayev University, the principal alternative for increasing the autonomy of a public institution was to establish it as a private, for-profit joint stock company in which the Government of Kazakhstan is a major stockholder. While such a change technically increases an institution's autonomy, the Government can retain significant control through its majority ownership;
- based on experience of NU, the intent to introduce corporate governance on a stage-by-stage basis at the national universities. As an initial step by the end of 2013 year, supervisory Boards have been established for four national universities:
- Al-Farabi Kazakh National University

87 Higher Education Funding Council for England http://www.hefce.ac.uk/

88 Higher Education Authority, Ireland http://www.hea.ie/

89 Kentucky Council on Postsecondary Education http://cpe.ky.gov/

90 Texas Higher Education Coordinating Board www.thecb.state.tx.us/

91 University System of Georgia http://www.usg.edu/

92 University of Wisconsin System http://www.wisconsin.edu/

- L.N. Gumilev Eurasian National University
- Abay Kazakh National Pedagogical University
- Kazakh National Agrarian University;
- the establishment of the new independent accrediting bodies based on international models;
- increased autonomy for institutions that achieve accreditation through the new accrediting process;
- granting increased flexibility to institutions to develop curricula through modifications of the state standard;
- increased autonomy for HEIs that gain accreditation under the new accrediting bodies.

From the project team's interviews with senior officials at the MES, it is clear that the Ministry is pursuing actions to redefine its role to support of a more decentralised, autonomous network of institutions while at the same time maintaining essential national-level regulatory controls. The establishment of new independent entities to carry out critical functions previously undertaken by the MES illustrates this intent. These entities include the new accrediting bodies as well as the Bologna Process and Academic Mobility Center. An especially important development is the new independent national center the National Center for Education Statistics and Assessment (NCESA), and the alignment of statistical definitions and reporting with international standards (e.g., UNESCO, Institute of Statistics, ISCED levels, etc.).

Problems that need to be addressed

Continuing legal constraints on autonomy of public universities. The issues related to institutional autonomy relate in particular to the nine national universities and the other 33 public universities. As the project team understands the current context, these public institutions, in addition to being within the oversight of the MES, are also subject to the provisions of the Law on State Property, which applies to all state enterprises. All the physical assets of the institutions (e.g., land and buildings) are the property of the State, not the institution. The practical impact of these requirements is that the universities are subject to detailed budgetary and procedural controls that do not apply to private institutions or to Nazarbayev University. Prior to the establishment of Nazarbayez University through a new law, the principal alternative to the status as public institution was to transfer the institutions to the status of private joint stock companies in which the state remains a majority stockholder. Sixteen universities now have this status. An issue that remains to be addressed is the extent to which Kazakhstan should extend the same kind of legal status accorded Nazarbayev University to all public universities once the appropriate accountability mechanisms have been put in place.

Continuing regulatory constraints related to the capacity of institutions to assume increased responsibility for curriculum and academic programme development. The project team recognises the important steps already taken to increase institutional responsibility for academic programmes. However, the continuation of highly centralised processes for developing state standards and other details of academic policy appear to be significant barriers to the development of institutional responsibility for academic policy.

Continuing focus of budgetary oversight on pre-expenditure, pre-audit budgetary controls. While public institutions are in theory granted flexibility in the implementation of budgets and internal management of resources, the reality appears to be that the MES continues to require detailed accountability for budget changes and other details. Continuation of these practices is likely to undermine effective institutional management.

Developing the capacity to implement a new model of governance for all public institutions. As emphasised in the earlier sections of this chapter, Kazakhstan must develop a high quality, diverse network of institutions – not only globally competitive research universities. The current plan to extend corporate governance on the model of Nazarbayev University to the nine national universities is an important step. The issue remains, however, of how to extend significantly increased autonomy to the remaining universities, academies and institutes with missions oriented more to teaching and preparing technicians and specialists to respond to regional and national priorities as illustrated by the experience of Nazarbayev University and the four pilot national universities, developing capacity for corporate governance requires careful attention to developing, among other points:

- new competencies in institutional leadership as well as professional and academic staff;
- selection and training of members of governing boards;
- new tools for institutional management including transparent budgeting, use of data for planning and monitoring institutional operations, and other functions.

Redefining the roles and responsibilities of the MES. As noted above, the leadership of the MES clearly understands the need for change. The question remains, however, regarding the exact nature of that change. International experience, as summarised above, underscores the need for a highly competent national-level tertiary education authority, whether that be within the Ministry or an independent entity, to provide leadership for the system as a whole and to ensure public accountability of the increasingly autonomous network of institutions. A transition to a new MES role will require careful attention to:

- developing the core competencies of the national-level professional and technical staff;
- developing new policy tools and competencies related to budgeting and allocation of funding (see section on finance);
- developing data/information systems and the capacity to use data to monitor institutional and system performance.

The absence of a national level means for systematic and systemic implementation of multiple reforms related to tertiary education. As emphasised throughout this chapter, Kazakhstan is taking many steps that are in the direction of best international practice. The concern is the need for not only co-ordination among these initiatives but also for more systemic preparation of institutions to implement change (e.g., through professional development, technical assistance on new management techniques, etc.). Many of these initiatives are being led by the MES, which faces a challenge of making a transition from practices from the past that are inconsistent with the new roles that the MES will play in the future. What appears to be absence is an "implementation platform" charged with responsibility for managing systemic and systematic change. As noted above, the experience of other countries indicates that developing the capacity to implement change is one of the keys to successful reforms.

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APPENDICES

APPENDIX A: Tables showing how the differences in pre-school provision relate to different age-groups

Table 33. CHILDREN AGED 0-7

Age group	Total number of children (aged 0-7)	Number of children in primary schools (aged 5-7)	Total number of children in pre-schools/ kindergartens/ mini-centers	Coverage of children in all types of pre-school education (%)
0-7 years	235 423	422 777	831 233	35.37

Table 34. CHILDREN AGED 3-7

Age group	Total number of children (aged 3-7)	Number of children in kindergartens	Number of children in mini-centers	Number of children in pre-schools	Coverage of children in all types of pre-school education (%)
3-7 years	1 395 166	389 071	156 027	199 744	53.4

Table 35. CHILDREN AGED 3-6

Age group	Total number of children (aged 3-6)	Number of children in kindergartens	Number of children in mini-centers	Number of children in pre-schools	Coverage of children in all types of pre-school education (%)
3-6 years	1 128 891	389 058	155 797	198 443	65.8

Table 36. CHILDREN AGED 5-7

Age group	Total number of children (aged 5-7)	Number of children in kindergartens	Number of children in mini-centers	Number of children in pre-schools	Number of children in primary schools	Coverage of children aged 5-7 in all types of education (%)
5-7 years	814 081	129 750	38 326	199 744	422 877	97.1

APPENDIX B: Background information to the Reggio approach and early childhood services

The northern Italian town of Reggio Emilia has become recognised, world-wide, for the extraordinary quality of its municipal services for young children: infant schools for children aged three to six, and infant-toddler centers for children from three months to three years. Two distinguishing features of the approach are:

- the construction of the child as an active learner;
- the relationship between teaching and learning.

The Reggio understanding of children as learners is vividly expressed by Carlina Rinaldi, until recently Director of Services for young children in the region:

The cornerstone of our experience, based on practice, theory and research, is the image of children as rich, strong and powerful … They have potential, plasticity, the desire to grow, curiosity, the ability to be amazed and the desire to relate to other people and to communicate … They are eager to express themselves within the context of a plurality of symbolic languages … They are open to exchanges and reciprocity as deeds and acts of love which they not only want to receive but also to offer (Edwards et al, 1998, p. 144).

This view of young children excludes any possibility that because of their age and biological immaturity they are in any sense weak, needy or lacking in ability. The approach focuses on children's powers, their capacity, their potential for growth. Loris Malguzzi, one of the founding fathers of the Reggio approach underlines the theme of children's agency in learning:

What children learn does not follow as an automatic result from what is taught. Rather it is in large part due to the children's own doing as a consequence of their activities and our resources … Always and everywhere children take an active role in the construction and acquisition of learning … Children show us they know how to walk along the path to understanding (Edwards et al, 1998, p. 67).

This shared understanding of childhood shapes the Reggio approach to pedagogy and is a determining factor in defining the educational opportunities that are offered them.

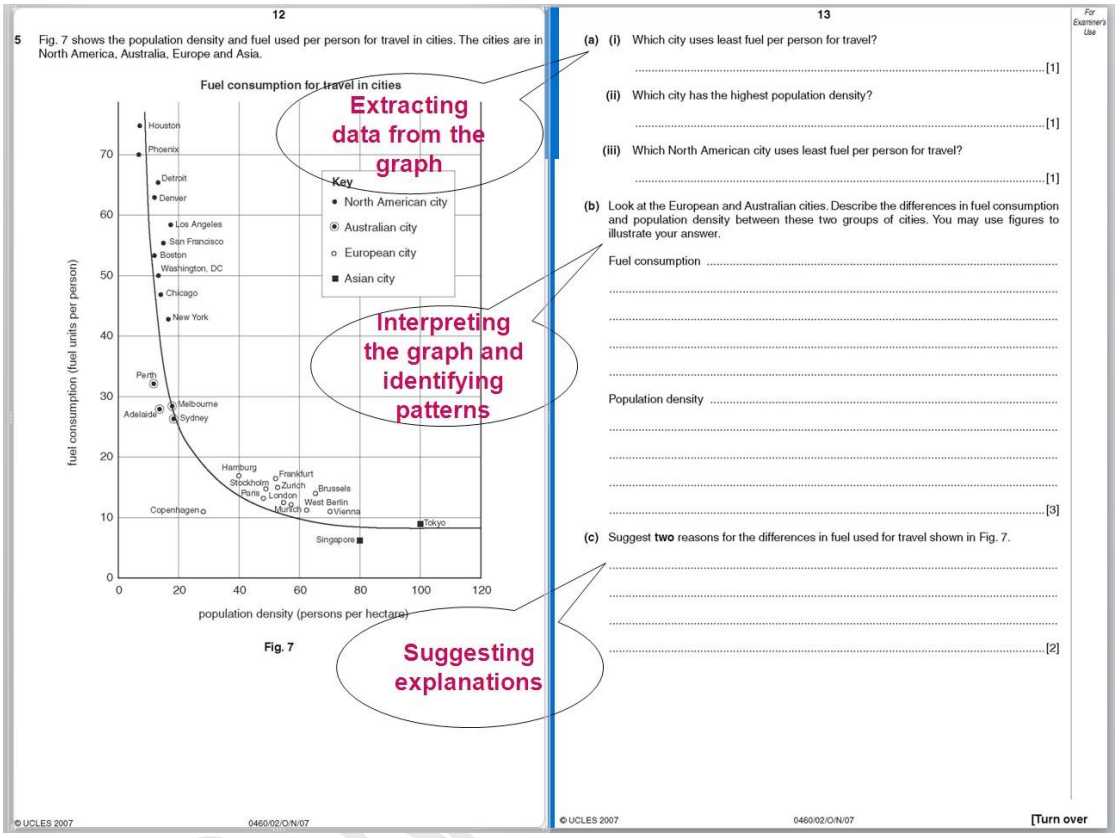
The relationship between teaching and learning: the Reggio approach honours learning over teaching, and sees the task of teaching as being to provide the conditions and opportunities that enable learning to flourish. These conditions include an emphasis on the pedagogy of relationships, between child and child, between educator and child, and between educators themselves, who always work in pairs, and see their own growth and professional development as absolutely essential for the education of their children. Malaguzzi describes the relationship in these terms:

Learning is the key factor on which a new way of learning should be based, becoming a complementary resource to the child, and offering multiple options, suggestive ideas and sources of support. Learning and teaching should not stand on opposite banks and just watch the river go by; instead they should embark together on a journey down the water. Through an active reciprocal exchange, teaching can strengthen learning how to learn (Edwards et al, 1998, p. 83).

APPENDIX C: International examination questions set for students at grades 10, 11 and 12

Figures 7, 8, 9, 10 and 11 are examples (courtesy of Tristian Stobie, CIE) of questions set in the IGCSE Examination applied in 120 countries *via* Cambridge International Examinations to students at grade 10 and then AS/A Level Papers sat by students at grades 11 and 12.

Figure 7



Notes: The graph will not have been seen by students before the examination. The test assesses their ability to extract information from the graph to interpret it and to apply other knowledge they have to explaining certain features.

Figure 8

History AS/A-Level Example 1 (from November 2011 paper)

1 Read the Sources, and then answer the question.

When answering **Question 1**, candidates are advised to pay particular attention to the interpretation and evaluation of the Sources both individually and as a group.

Source A

An attempt is being made to bring together the countries in the Triple Entente for a concentrated attack on Germany and Austria. At an agreed time, the drawbridges will be let down, the doors will be opened and the million-strong armies of the Triple Entente will be let loose, ravaging and destroying across the borders of Germany and Austria. The danger seems gigantic.

Field Marshal Count Alfred von Schlieffen, German Military Chief of Staff until 1905, in an article written in 1909.

Source B

Serbia and Rumania have become the most dangerous enemies of Austria and are supported by Russia and France. The Triple Entente has therefore achieved superiority. With a combination of Britain, France, Russia, Rumania, Serbia and Montenegro on the one hand, and Austria, Germany and Italy on the other, military superiority lies on the side of the Triple Entente in terms of numbers and geographical advantage.

Conrad von Hötzendorf, Austrian Military Chief of Staff, memorandum to the Austrian government, 16 January 1914.

Source C

We must attempt to limit the conflict between Austria and Serbia. Whether we succeed in this will depend first on Russia, and then on the moderating influence of Russia's allies. There is certainly some agitation in St. Petersburg, the capital of Russia, but, on the whole, Russia is not ready to declare war at present. Nor are France and Britain anxious for war at the present time. According to well-informed experts, Russia will be prepared to fight in a few years. Then she will crush us by the number of her soldiers. She will have built her Baltic Sea fleet and her extensive railway system. Meanwhile, the Triple Alliance becomes weaker. I believe the Russian Ambassador to Britain when he told you that Russia does not want war at present. The Russian government is half-friendly to Germany today. I still hope and believe, even today, that the conflict can be localised between Austria and Serbia. In this matter, the attitude of Britain will be very significant. Sir Edward Grey, the British Foreign Secretary, is always talking of the balance of power between the Triple Alliance and Triple Entente. Therefore, it should be perfectly obvious to him that this balance of power would be completely destroyed if Germany deserted Austria and if Austria were destroyed by Russia. Therefore, if Grey is honest and logical, he must support Germany in trying to localise the conflict.

Traugott Jagow, German Chief of Police, in a letter to Prince Karl Max Lichnowsky, German Ambassador to Britain, 18 July 1914.

Source D

The crisis has been cunningly planned by Russia. While giving assurances that she was not yet mobilising, she has been preparing for war so that, when she officially mobilises, she will be prepared to move her armies forward in a few days. Russia assures Germany that she does not want to take action against us. However, she knows perfectly well that Germany could not remain inactive if war breaks out between Austria and Russia. So Germany too will be forced to mobilise and Russia will say to the world, 'We did not want war, but Germany brought it about.' Germany does not want to bring about this frightful war. France is also preparing to mobilise her armies. It is clear that Russia and France are cooperating closely in their plans. Every day, the military situation is becoming more unfavourable for us.

Count Helmuth von Moltke, German Military Chief of Staff, in a letter to Theobald Bethmann Hollweg, German Chancellor, 29 July 1914.

Source E

Last week I stated that we were working to preserve the peace of Europe. Events have now moved so rapidly that it is clear that the peace of Europe cannot be preserved. Russia and Germany have declared war upon each other. We have worked for peace up to the last moment, and beyond the last moment. We have always done so. It is generally agreed that we worked for peace throughout the Balkan crisis in 1912. In the present crisis it has not been possible to secure the peace of Europe: because there has been little time and there has been a tendency – at any rate in some countries which I will not name – to force things rapidly to a crisis with a great risk to peace.

The present crisis began with a dispute between Austria and Serbia. I can say with the most absolute confidence that no government and no country has less desire than France to be involved in war over a dispute with Austria. France is involved in it because of their obligation of honour under an alliance with Russia. That obligation of an alliance cannot apply in the same way to Britain. We are not part of the Franco-Russian alliance. We do not even know the terms of the alliance. For many years we have had a long-standing friendship with France [Shout from an MP: 'And with Germany!']. I remember the warm and friendly feeling in this Parliament because these two nations, who had had perpetual differences in the past, had cleared away these differences. But people must decide for themselves how far this friendship obliges us to support France.

Sir Edward Grey, British Foreign Secretary, speaking to Parliament, 3 August 1914.

Now answer the following question.

'The Triple Entente was a serious threat to peace before World War I.' Use Sources A–E to show how far the evidence confirms this statement.

Evaluation

Figure 9

IGCSE Geography Example 1 (from November 2012 paper)

(b) Study Fig. 3, which shows the built up area of Paris, the capital city of France (an MEDC in Europe).

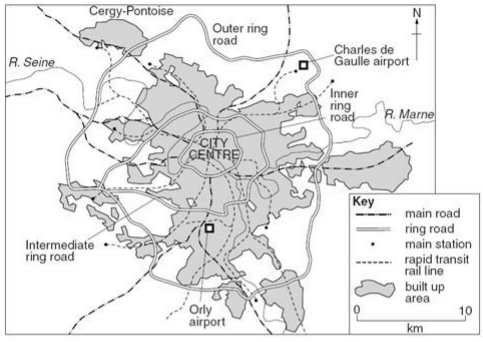


Fig. 3

(i) Describe the location of Cergy-Pontoise.

.....

.....

.....

.....

.....

..... [3]

Comprehension

(ii) Suggest reasons why new housing and industry have grown up at Cergy-Pontoise.

.....

.....

.....

.....

.....

.....

.....

..... [4]

Analysis

(iii) Explain the impacts of urban sprawl around large urban areas in MEDCs.

.....

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.....

.....

..... [5]

Evaluation

Figure 10

IGCSE Biology Example 1 (from November 2011 paper)

(c) Fig. 2.1 shows the results of an investigation of the heart rates of some students before and immediately after running.

Each student ran the same distance.

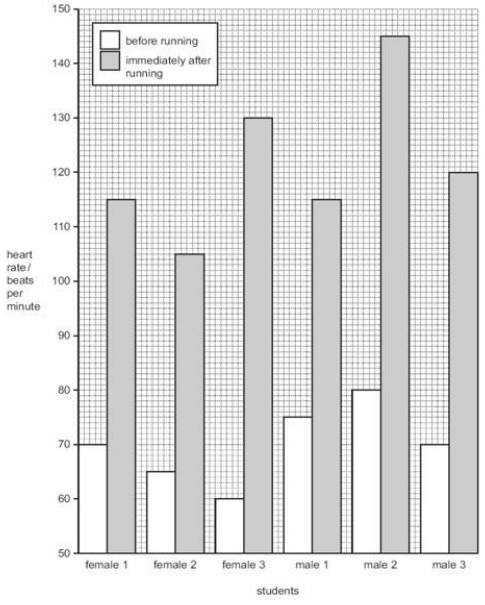


Fig. 2.1

(i) State which student has the lowest heart rate immediately after running.

..... [1]

(ii) State which student ... ate from before to immediately after runni...

..... [1]

(iii) Describe any trends that you can see in the results.

..... [2]

Comprehension

Analysis

(d) Explain why heart rate changes when you run.

..... [4]

[Total: 12]

Application

Figure 11

AS/A-Level Biology Example 1 (from November 2011 paper)

1 Fig. 1.1 is a scanning electron micrograph of part of the wall of the bronchus of a healthy human.

Fig. 1.1

(a) (i) Name the structures labelled **A**.

.....

(ii) State the function of the cells labelled **B**.

.....

(b) Name two tissues found in the wall of the bronchus that are not visible in Fig. 1.1.

1. .....

2. .....[2]

Comprehension

Chronic bronchitis is one of the conditions that contributes to chronic obstructive pulmonary disease (COPD).

(c) State the name of the other condition that contributes to COPD.

.....[1]

(d) Describe the appearance of a section through the **wall** of a bronchus in a person with chronic bronchitis.

.....[4]

Comprehension

(e) Suggest why a person with chronic bronchitis is more likely than a healthy person to suffer from infectious diseases of the gas exchange system.

.....[2]

Application

Source: Cambridge International Examinations

Appendix D: Expected student outcomes according to the Educational programme for Kazakh, Russian and English languages approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan №367 dated 09.07.2010

Kazakh Language for classes of Russian-medium students for schools with maths and science orientation	**Russian Language for classes of Russian-medium students for schools with maths and science orientation**	**English Language for schools with a maths and science orientation**
Aims of the Educational programme for Grade 10-11 are: • To develop high school student's communicative ability in Kazakh language from the perspective of language ability, understanding, linguistic and cultural, socio-cultural and world outlook; • to learn Kazakh from communicative perspective: to develop student's ability to communicate freely and constructively his/her own point of view, ideas in written and orally; • to develop student's literacy and accurate communicative skills in Kazakh; • to lead communication in Kazakh taking into consideration personal and social directions in the programme. For schools with math and science direction: Grade 10 – 4 hours per week; 136 hours per year Grade 11 – 4 hours per week; 136 hours per year In Grade 11 learners should be able to: Listening: • Understand articulated text and information; • Understand dialogue from audio-recordings and retell its content;	Aims of the Educational programme for Grade 10-111 are: to teach high school students freely, intelligently and expressively communicate in Russian. This calls for the development and improvement of all kinds of speech activity. The repetition of grammar, spelling, punctuation, is associated in nature, permeates the entire course of Russian language in grades 10-11. It concerns the most difficult topics in grammar and spelling in terms of their learning students, the typical errors. The selection and grouping of the material studied at the secondary level, it will give large "blocks" and save training time. Objectives: • provision of knowledge and skills from the field of speech studies, formation of other skills related to command practical speech genres, such as note-taking, course work, annotations, report, complex plan, essay, business letters, etc.;	Aims of the Educational programme for Grade 10-11 are: • developing multilingual personality: introduction to the values of world culture, promote advanced knowledge about their native culture through cultural dialogue, humanistic mindset formation; • developing intercultural communication competence and its sub-competency: language competence, verbal competence, socio-cultural competence, linguistic-culture competence, compensatory competence, educational and cognitive competence Objective of the Educational Programme for Grades 10-11 to achieve the level of B1: For schools with math and science direction: Grade 10 – 2 hours per week; 68 hours per year Grade 11 – 2 hours per week; 68 hours per year For schools with humanities direction: Grade 10 – 4 hours per week; 136 hours per year Grade 11 – 2 hours per week; 68 hours per year

Kazakh Language for classes of Russian-medium students for schools with maths and science orientation	**Russian Language for classes of Russian-medium students for schools with maths and science orientation**	**English Language for schools with a maths and science orientation**
• Evaluate information acquired from the given theme. Reading: • Read and understand documents written in state language; • Choose needed basic information in the given text; • Extract/Draw out needed information according to specific learning objective. Speaking: • Speak about stories or other texts which they read; • Review newspaper and magazine materials independently and identify main idea. Writing: • Fill in documents following its logical content in systematic way; • Create dialogue on different themes; Conversation: • Use learnt material in everyday life; • Discuss familiar topics with other people; • Express own thoughts on the read text; • Listen dialogue and create own dialogue on the similar theme;	• developing culture of verbal behaviour of students with respect to various aspects and situations of communication; improving the culture of speech, developing skills in group communication. For a complete education in the native language written literacy is not enough, graduates should be able freely use the language in different life situations, have basic functional literacy. For schools with math and science direction: Grade 10 – 1 hours per week; 34 hours per year Grade 11 – 1 hours per week; 34 hours per year By the end of the 11th grade, students should know and be able to: Students should be able to: • on phonetics: in a word to distinguish stressed and unstressed vowels, voiced and unvoiced, hard and soft consonants, divide words into syllables, words phonetically parse, find help in pronouncing dictionary of pronunciation and stress in a word, the correct pronunciation of vowels and consonants in accordance with the norms of the literary language, to produce a phonetic analysis of words;	Students demonstrate the ability: • in the process of intercultural communication in dialogue form: to lead the discussion in the framework of the issues discussed or on the basis of read/ listened text by practicing the rules of speech etiquette; • participate in polylogue, including in the form of discussion by observing speech norms and conduct adopted in the countries where this language is spoken, by requesting and sharing information, expressing and arguing their point of view, protesting, asking the interlocutor and clarifying his/her opinion and point of view, taking the lead in the conversation, making clarifications / supplements, expressing the emotional relation to the views expressed / discussed / read /seen. The volume of conversations – up to 15 replicas from each communicant; • detailed / short summary of what is been read / listened / seen, to represent the country and its culture in a foreign language environment, to express their impressions of the countries of the target language and their culture, to express and explain their point of view; • to draw conclusions; • evaluate the facts / events of contemporary life and culture. The volume of monologue statements up to 20 phrases;

Kazakh Language for classes of Russian-medium students for schools with maths and science orientation	**Russian Language for classes of Russian-medium students for schools with maths and science orientation**	**English Language for schools with a maths and science orientation**
• Listen dialogue from audio-recording and retell it in the form of monologue; • Continue conversation, debate, argue. Vocabulary: • Know direct and implied meaning of words, use different meanings of the word; • Use set-expressions, proverbs and sayings, aphorisms in communication; • Know about using of homonyms, antonyms, synonyms; • Know terms which mean concepts (notions) that appeared owing to the progress in industry, science, technology, arts and culture; • Find out proverbs containing set-expressions independently and work with dictionary; • Learn about 1 300 lexical units/words. Composition of a word: • Know about composition of a word, the types of derivative words.	• on the vocabulary: to interpret the lexical meaning of the words in which it is used in a sentence, select the word antonyms and synonyms, find the text ambiguous words, homonyms, paronyms to appear in the dialect, professional and obsolete words, use a dictionary of foreign words and dictionaries, use words in their intrinsic value; • on word-formation: analysis of words in composition, determined with the help of what is and what formed the word, to define a method of forming words, make word-formation analysis; • on morphology: identify parts of speech, to determine their permanent and non-permanent signs, produce morphological analysis, the correct shape to form words; • on syntax: allocate combinations of offers, featuring simple sentences to complex, to find in the major and minor clause of the sentence, to distinguish simple sentences from complex, difficult to distinguish between types of sentences, parses any proposal to define complex syntactic unit; • for punctuation: the rules for punctuation;	• in the perception of foreign language listening comprehension: understand the main content of the authentic sayings in common everyday communication; • retrieve selected information from the audio / video text in various genres (functional, situational and thematic) within the specified subjects; evaluate listen and use the information to communicate; • to identify the theme / issue in radio / in television programmes of philological orientation allocate facts / examples / case in accordance with the supplied question / problem, summarize factual and evaluative information from the audio / teletext by defining their attitude to it. Time for audiotext – up to 3 min; • in reading: basic text analysis, interpretation of authors discussions and conclusions; • evaluate and express their attitude to the read (relevance, personal significance, relevance to the issues raised in the text), using the information in order to communicate; • to put questions to the main and secondary information; • separate the objective from the subjective information, ie reasoning from facts; identify implicit information; • understand the content, based on background knowledge / wider context, to extralinguistic device text and font selection;

Kazakh Language for classes of Russian-medium students for schools with maths and science orientation	**Russian Language for classes of Russian-medium students for schools with maths and science orientation**	**English Language for schools with a maths and science orientation**
Grammar: • Know grammatical categories of noun; • Identify syntactic function of parts of speech in sentences; • Know the types of complex sentences; • Identify the differences between complex and simple sentence; • Use the types of styles in everyday life appropriately	• in style: define styles of the various texts, their main theme and idea, create coherent statements comply with the rules of the literary language, to write an essay, observing the selected style, improve the writing.	• translate text or subset (orally or in writing); • in the field of intercultural communication in writing: annotate and abstracted specialized texts; • describe the results of the project work (report, speech); • describe events / facts / events; inform / to request information, expressing his own opinion / judgment; • has an in-depth interdisciplinary knowledge about the cultural heritage of the country / countries of the target language, the living conditions of life, opportunities to acquire quality education, value orientations, the peculiarities of life in a multicultural society; • uses the language to communicate and present social and cultural portrait of the country of the language being studied and of his/her country to its foreign peers.

APPENDIX E: Standard subject plan approved by the Ministry of Education and Science of the Republic of Kazakhstan

Table 37. Standard Subject Plan with Kazakh language of instruction

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11
								CSKL*/ HD**/ AK***	CSKL/ HD/ AK	HD/ MSD****/ AK/ AE*****	HD/ MSD/ AK/AE
Language and literature	8	8	11	11	11	10	10	10/12/12	9/12/11	12/7/ 15/14	12/7/ 5/14
Literacy (reading and writing)	7	-	-	-	-	-	-	-	-	-	-
Kazakh language	-	3	4	4	3	3	3	3/4/3	1/3/1	2/2/ 3/2	3/2/ 4/2
Reading literacy	-	4	4	4	-	-	-	-	-	-	-
Kazakh literature	-	-	-	-	3	2	2	2/3/2	3/4/3	2/1/4/2	2/1/ 4/2
Russian language	-	-	2	2	2	2	2	2/2/2	2/2/2	2/1/2/2	2/1/ 2/2
Russian literature	-	-	-	-	1	1	1	1/1/1	1/1/1	2/1/2/2	2/1/ 2/1
Foreign language	1	1	1	1	2	2	2	2/2/4	2/2/4	4/1/4/6	4/1/ 4/6

** Comprehensive school with Kazakh language instruction*

*** Languages in schools with humanities orientation*

**** Languages in schools with advanced Kazakh orientation*

*****Languages in schools with math and science orientation*

****** Languages in schools with advanced English orientation*

Table 38. Standard Subject Plan with Russian Language of instruction

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11
								CSRL*/ HD**/ AR***	CSRL/ HD/ AR	HD/ MSD****/ AR/ AE*****	HD/ MSD/ AR/AE
Language and literature	10	10	12	12	12	12	12	12/14/ 14	12/14/ 14	14/10/ 17/16	13/10/ 17/15
Literacy (reading and writing)	7	-	-	-	-	-	-	-	-	-	-
Russian language	-	3	4	4	3	3	3	3/3/3	3/3/3	2/2/ 3/2	2/2/ 4/2
Reading literacy	-	4	4	4	-	-	-	-	-	-	-
Russian literature	-	-	-	-	2	2	2	2/4/2	2/4/2	2/1/ 4/2	2/1/ 4/2
Kazakh language	2	2	3	3	4	4	4	4/4/4	4/4/4	4/4/ 4/4	4/4/ 4/4
Kazakh literature	-	-	-	-	1	1	1	1/1/1	1/1/1	2/1/ 2/2	1/1/ 1/1
Foreign language	1	1	1	1	2	2	2	2/2/4	2/2/4	4/2/ 4/6	4/2/ 4/6

* *Comprehensive school with Russian language instruction*

** *Languages in schools with humanities orientation*

*** *Languages in schools with advanced Russian orientation*

*****Languages in schools with math and science orientation*

***** *Languages in schools with advanced English orientation*

Table 39. Standard subject plan with Uigur/Uzbek/ and Tajik language of instruction

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11
										MSD**	HD/ MSD
Language and literature	10	10	12	12	13	13	13	13	13	15/10	15/10
Literacy (reading and writing)	7	-	-	-	-	-	-	-	-	-	-
Mother tongue	-	4	4	4	3	3	3	3	3	2/1	2/1
Reading literacy	-	3	3	3	-	-	-	-	-	-	-
Uigur/ Uzbek/ Tajik Literature	-	-	-	-	2	2	2	2	2	1/1	1/1
Kazakh language	2	2	3	3	2	2	2	2	2	2/1	2/1
Kazakh literature	-	-	-	-	1	1	1	1	1	2/1	2/1
Russian language	-	-	2	2	2	2	2	2	2	2/1	2/1
Russian literature	-	-	-	-	1	1	1	1	1	2/1	2/1
Foreign language	1	1	1	1	2	2	2	2	2	4/2	4/2

**Languages in schools with humanities orientation*

***Languages in schools with math and science orientation*

APPENDIX F: Table 40 shows the study guide for preparation for UNT (2013) published by the National Testing Center of the Ministry of Education and Science of the Republic of Kazakhstan

Table 40. Study guide for preparation for UNT (2013)

Kazakh language in classes with Russian language of instruction- L2	**Russian language in classes with Kazakh language of instruction – L2**	**English Language in classes with the Russian language of instruction**
Logical questions: Q1. Find the name of the food formed by converting the verb into a noun. A) Shovel B) Comb C) Snowstorm D) Happiness E) Cottage cheese Q5. Please define what is my relationship with my dad's elderly son? A) Younger brother B) Elder brother C) Cousin from father's side D) Cousin from mother's side E) Father Q8. Please find the voice", which "takes bath, dresses, comes itself" A) Passive voice B) Active voice C) Middle Voice D) Medio-passive Voice E) Participle Testing questions: Q3 – Variant 1: Find the row of word with soft vowels: A) Arman, murat B) Zhazyk, tau C) Bilim, tarbie D) Urpak, galym E) Ashyk, kysan	Logical questions: Q2: Unstressed consonant [O] is in the word: A) Kion B) Kakao C) Shosse D) Pal'to E) Kommiyunik Q6: Find the sentence where 'subject' is underlined incorrectly: A) Driver stopped the train B) The TV was fixed by the master C) Student studied D) The sky was covered by clouds E) The new books were bought for us Q8: The following scheme corresponds with sentence: We didn't know if everyone was back home after the walk (No punctuations) A) [ ], [ ]. B) [ ], ( ). C) [ ]: [ ]. D) [ ] – [ ]. E) [ ]; [ ]. Testing questions: Q3 – Variant 1: Dependent words are: A) Adjectives, participle B) Numerals, adverbs C) Nouns, pronouns D) Adverbs, indifferent form of verbs E) Gerund, participle	Logical questions: Q2: Common word for all: A) Parents B) Children C) Education D) Bibliography E) Relatives Q6: Find similar: Symptom-problem A) High temperature – asthma B) Headache, fever, aching muscles – the flu C) Toothache – overeating D) Nose bleeding – oversleeping E) Heart-attach- black eye Q8: Choose the redundant A) Carrot B) Onion C) Cabbage D) Pepper E) Grapes Testing Questions: Q3 – Variant 1: Choose the correct word: Open… door, please! A) The B) An C) – D) Those E) A

Kazakh language in classes with Russian language of instruction- L2	Russian language in classes with Kazakh language of instruction – L2	English Language in classes with the Russian language of instruction
Q15 –Variant 4: Please define the correct time of the sentence: My friend's brother is in military service now. A) Future time B) Present transit time C) Future transit time D) Present time E) Past time Q1 – Variant 6: Find the row with only sonant: A) Б, В, Г,Г, Д, Ж, З B) О,Э, І, Н, У,У C) П,Ш,Т,С,К,К,h D) Р,Л,Й,М,Н,Н,У E) А,О,Ы,У,У,О Q5 –variant 7: Kazakh language belongs to: A) Turkic B) Chinese C) Greek D) Latin E) Slavic Q5 – variant 9: What did Dauletkerei Shygaibaiulu do? A) Artist B) Sculptor C) Singer D) Composer E) Kobyz player Q19 – Variant 14: How do you call the relatives of the mother? A) Zhien B) Nemere C) Zhenge D) Kyz E) Nagashy	Q15 – Variant 4: Which one is not word-combination: A) State examination B) Seminars are conducted C) Pass the exam D) Practical lessons E) Interesting lesson Q1 – Variant 6: Find the word with six syllables A) Glasnaya B) Pogovorka C) Verbliyuzhenok D) Pouchitelnyie E) Skorovorka Q5 – Variant 7: Find the compound sentence with adversative conjunction: A) Right word, if said at right time, always finds the way to heart B) The wind is blowing on the sea and hurries ships C) The sun is rising on the horizon and spreading its lights to immense space. D) The sun is down, but it is still light on the field. E) The clouds appeared and brought the rain. Q5 – Variant 9: Collective word: A) Sugar B) Reading C) Journal D) Book E) Leaves	Q15 – Variant 4: finish the sentence Time…not wait. (proverb) A) Do B) Does C) Has D) Are E) Is Q1-Variant 6: Letter 'c' is read [k] A) Café B) Citizen C) Circus D) Cinema E) Century Q5 – Variant 7: Choose the correct answer: He said they … to buy flowers for her. A) Forgot B) Had forgotten has forgotten C) Has forgotten D) Have forgotten E) Forgot Q5 –Variant 9: Choose the correct version: Show me a picture of Ann. I … her A) Had never seen B) Didn't' ever seen C) Has never seen D) Never saw E) Have never seen

Kazakh language in classes with Russian language of instruction- L2	Russian language in classes with Kazakh language of instruction – L2	English Language in classes with the Russian language of instruction
Q1 –Variant 17: Find the antonym: A) Warning – inviting B) To loose – to find C) To lift – to heighten D) To come – to sit E) To take – to read Q12 – Variant 19: Find the complex adjective: A) Tungi – night time B) Zhasyl – green C) Konyr – brown D) Kok-Ala – green-blue – multi coloured E) Zhumsak – sodt Q22 – Variant 19: Find the sentence with correct punctuations: A) 'Probably, we will meet", - said the young man B) 'Probably,' – we will meet said the young man C) 'Probably, we will meet", - said the young man D) Probably, we will meet said", - the young man E) 'Probably, we will meet" said the young man	Q19 – variant 14: Find the complex sentence with subordinate adjective A) Lomonosov was the first to define that heat is produced by movement of molecule B) The village, where Yevgeni felt board, was the charming place C) Poor deaf guy haven't never thought of that Mumu could betray itself by yelping. D) Tole bi advised to soldiers to establish the capital, where his army executed a halt. E) As soon as we went up to the mountain, a beautiful scene has opened. Q12 – Variant 19: Which participle is used in this sentence: The wide blew with the smell of wormwood and wheat straw A) Active participle of the present time B) Active participle of the past time C) Passive participle of the past time D) Passive participle of the present time E) Short form of the passive voice Q22 – Variant 19: Find the row of borrowed words A) Boy, girl, child, B) Wind, tree, spring C) Day, night, birch-tree D) School, druzhina, teacher E) Watermelon, author, lift	Q19 – Variant 14: Finish the sentence: Jonathan Swift is a famous… A) American architect. B) English composer C) English writer D) American writer E) English painter Q1 – Variant 17: the letter 'a' is read differently in the word: A) Kate B) Map C) Mate D) Lake E) Age Q12- Varaint19: Finish the sentence: The City of London is … A) …the largest museum in London B) …the poorest part of London C) …the industrial part of London D) …the central square of London E) …the business part of London Q22 –Variant 19: Choose the sentence with the first type f real condition in the future: A) If the bus comes we shall take it B) They will have a test tomorrow C) I wonder if you will go with me D) Tell me if you are ready to go E) He will finish this work tomorrow

APPENDIX G: Distribution of UNT results between Kazakh and Russian-medium urban and rural schools

Figure 12. Distribution of UNT results between Kazakh and Russian-medium schools in urban schools

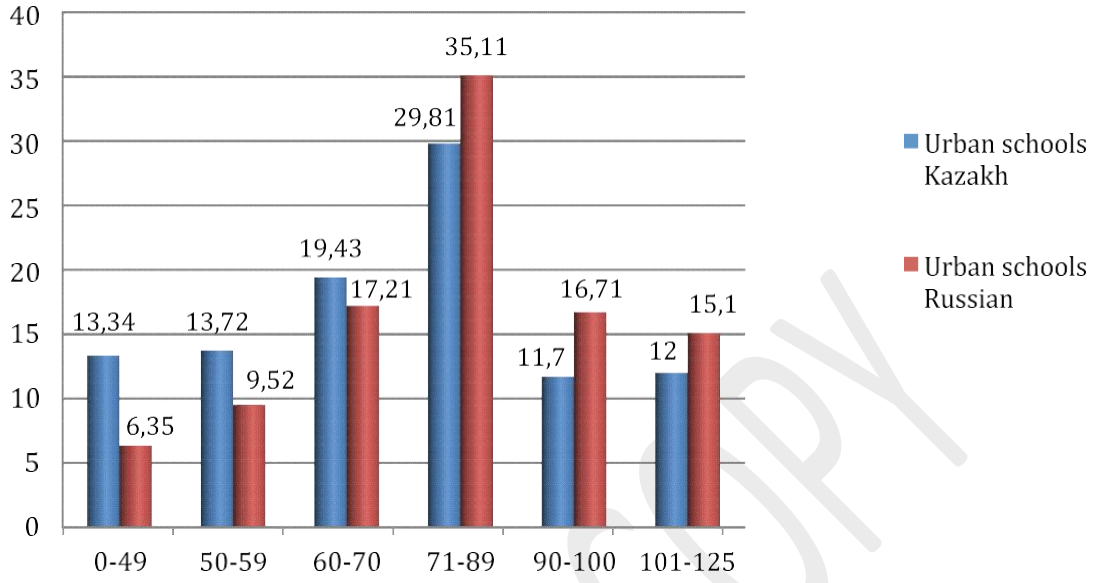
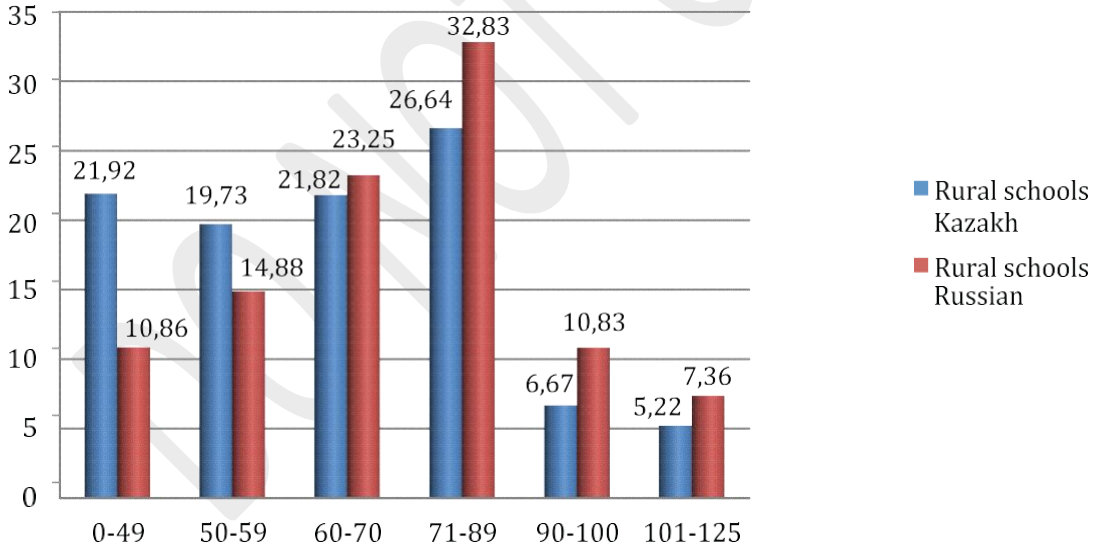


Figure 13. Distribution of UNT results between Kazakh and Russian-medium rural schools



Source: UNT 2012

APPENDIX H:Inclusive education questionnaire

Table 41. What do you think of the idea of inclusive education of children with disabilities? (% out of number of respondents)

I support the idea	38	24,1	45,1	31,4
I understand the issue	28	35,8	32	33,3
I do not care	2	1,7	0	0
I do not support	12	25,8	11,8	19,6
I am definitely against	4	6	3,9	5,9
I am not sure	16	7,7	7,8	9,8

Source: SANDZH, 2008

Table 42. How do you feel about the idea of inclusive education of children with normal development and children with special needs in mainstream schools? (% of the number in the group)

I support the idea	18,2	32,5
I understand the issue	43,4	31,3
I do not care	2,5	2,5
I do not support	20,1	18,8
I am definitely against	4,4	3,8
I am not sure	11,9	10,6

Source: SANDZH, 2008

APPENDIX I: Teacher characteristics

Total number of teachers:		292 064	100%
of which:			
Male		**Female**	
57 589	19.7%	234 475	80.28%
of which			
Teachers in Multi-graded schools		Others	
79 046	27%	213 018	73%
of which			
Teachers in Primary schools (Grade 1-4)		**Teachers in Secondary schools (Grade 5-11)**	
62 966	21,5%	229 098	78.5%

Teachers by their Education							
Higher Education		Not complete Higher Education		Vocational		Secondary	
All	Rural	All	Rural	All	Rural	All	Rural
87,90%	86,25%	0,63%	0,80%	11,30%	12,75%	0,15%	0,21%
of which							
Primary schools teachers by Education							
With higher education				With Vocational education			
74.58%				24.28%			

Age Range			
≥ 30	31-57	58 ≤ , including retired, still working	
24.30%	71.89%	3.9%	2.3% (retired, still working)

Teachers' qualification			
Higher category	First Category	Second Category	Without category
16.27%	30.99%	28.81%	23.93%

By experience				
≤ 3 year	3 – 8 year	9-16 year	17-20 year	20 year ≤
12.85%	19.30%	20.92%	12.58%	34.36%

Teacher demand in 2012-2013 education year 1076 teacher

Source: National Report 'Statistics of Educational System of the Republic of Kazakhstan', Astana, 2013.

APPENDIX J: Kazakhstan Teacher's attestation process and procedures

Table 43 Kazakhstan Teacher's attestation process and procedures

Process	Procedures
Preparation	- Complete application form, including detailed description of why he/she is applying for the qualification upgrade - Education diploma - Qualification documents, development over the last 5 years - Analysis of teacher effectiveness in interim attestation period - Materials related to analysis, including dynamics of students' development and their achievements in his/her subject area - Methodological materials developed during the interim attestation period and approved by the methodological council; - Authorship work, resources, publications, creative reports, speeches in meetings, seminars etc.
Submit application to Attestation Commission of the regional Department of Education not later than May 25	
I - Stage Qualification testing conducted by National testing Center	- Applicant should take test on three disciplines: 1) Subject knowledge test 2) Knowledge of the legislations of the Republic of Kazakhstan 3) Pedagogy and psychology
List of teachers approved to go to the II-stage released before December 31	
II - Stage Analytical summary of the results of attested (certified) Conducted by "ORLEU"'	- Attestation commission of the Regional Department of Education submits the documents of teachers to be attested (certified) to JSC "ORLEU" for further analytical work in order to confirm teacher's practice in the relevant qualificatio . - Documents to be submitted to JSC "ORLEU": - Mandatory: - Completed application for certain standard approved by the Chair of the Attestation Commission - Identity document (ID) - Education diploma - Work record book - Certificate on teacher's current qualification - Documents proving training course undertaken on subject area stated on the application form - Documents proving training course undertaken on additional subject areas

Process	Procedures
	- Voluntary: - Materials related to pedagogical experience (lesson plan development, developed teaching and learning resources) - Information on participation in creative competitions, scientific-practical conferences, seminars, roundtables, pedagogical readings - Information on participation in development, expertise of teaching-learning methodological complexes, subject programmes - Information on participation in experimental projects - Information on participation in the work of methodological units, creative groups - Information on participation in organisational and extra-curricula activities - Information on students' achievements, winners of Olympiads, competitions, competitive games - References, reports on assessment of competence, results of students and parents survey - Commission of Experts of all levels of "ORLEU" conducts analysis of teacher's work based on the provided documents without involving the pedagogue to be attested (certified)
- Conclusion of the Commission of Experts of "ORLEU" on compliance/ non-compliance of teacher's overall work to the qualification stated in his/her application form should be provided to the Regional Department of Education no later than March 31.	
Final Stage	- Within one month the Head of the Regional Educational Department or educational organisation based on decisions of the Attestation Commission should issue an order on assigning pedagogue qualification category - Educational organisation ensures the production and issuance of certificate of qualification category registered in the registration journal - Human relations offices of educational organisation records qualification upgrade in the work book of the pedagogue

Order of the Ministry of Education and Science of the Republic of Kazakhstan "about approval of the attestation rules of pedagogues," No.16 dated January 22, 2010

Order of the Ministry of Education and Science of the Republic of Kazakhstan "about approval of Standard qualification characteristics of pedagogues and equated professions," No.338 dated July 13, 2009

Order of the Ministry of Education and Science of the Republic of Kazakhstan "about approval of the technology to conduct qualification tests of pedagogues," No.357 dated July 03, 2010

APPENDIX K:

Table 44 Biology classroom (Grades 6-11)

№	Equipment name	Unit	Quntity for one class (30 places)
	Interactive and technical learning tools		
1	Interactive system	Q-ty	1
1.2	Multimedia Projector (integrated with interactive whiteboard)		
1.3	Audio system (integrated with whiteboard)		
1.4	Software for touch interactive whiteboard		1
1.5	Document Camera	q-ty	1
1.1	Interactive whiteboard with electromagnetic principle of action		
1.2	Multimedia Projector (integrated with interactive whiteboard)		
2	The system unit personal computer	Q-ty	1
6	Headset (earphone with MIC) to personal PC	unit	1
7	Web-camera	unit	1
8.	Set of computer measurement sensors with the registrar data experiments biology:	set	1
9.	Devices demonstration and General purpose:		
10.	herbaria:		4
11.	Collections:		11
12.	Microscopic:		
	set micropreparations in botany	н-р	15
	set micropreparations in zoology	н-р	15
	set micropreparations on the anatomy	н-р	15
	set micropreparations on the general biology	н-р	15
13.	Wet preparations:		
	The internal structure rat/ frog/ birds/ fish/ snake The development of bony fish/ frog/ frog/ crayfish/apeworm	unit	Each 1 Each 1

№	Equipment name	Unit	Quntity for one class (30 places)
14.	Dimensional models:		
	internal model lung structure Larynx model Heart model Head model model of pancreatic cancer Teeth model Head model with muscles sectional Eye model Nose model Ear model Tongue model The model of the stomach model of intestinal villi model of the genitourinary systems Model renal capsule model of the liver Model Spinal Cord model of a neuron The model of human torso Model muscle system human torso Model of development of the fetus man Model of cell division: mitosis and meiosis Model of DNA structure model RNA Model structure of the skin The model of the foot model endocrine systems model lymphatic systems model hydra coelenterates model lancelet Model of the eggs birds cell structure animal The model structure animal cell shell longitudinal model section of the root Model of the cell plants Model of the sheet Model of the structure of the stem model ciliates paramecium Model pea flower Model cabbage flower model flower potato Model peach flower etc	unit	Each 1
15.	Set simulators injuries Fake:		
	mushrooms vegetables fruit		Each 1
16.	Model-components:		
	protein biosynthesis Genetics of blood groups two-hybrid crossover Monohybrid crossing inheritance Rhesus cross chromosomes The role of the nucleus in the regulation of development The life cycle of the virus classification of plants and animal Gametogenesis in animals The development of tapeworm Reproduction and development chordates The development cycle of the roundworm The evolution of animals Evolution of plants agrocenosis plant tissues typical biocenose	set	Each 1
17.	Models osteological:		
	Skeleton model of rabbit skeleton model bony fish Dove skeleton model Frog skeleton model skeleton model man	unit	Each 1
18.	Scarecrow:		
	stuffed bird A stuffed fish stuffed bunny a stuffed rat	unit	1
19.	Optical devices:		
	magnifierbinoculars binoculars microscope training microscope electrical highlight and videookom	unit	15
20.	A set of chemical crockery and accessories for biology demonstration works:		1
	cone-shaped funnel 75-80 mm Board for drying dishes Ruff wash tubes Ruff washing flasks test-tube clamp dropper for Indicators 50 ml	unit	Each 2

№	Equipment name	Unit	Quntity for one class (30 places)
	Buttons for magnetic chalkboard etc	unit	40
	A set of chemical crockery and accessories laboratory work Biology:		
	Different types	unit	each 15
22.	A set of chemical reagents for study of biology:	set	2
	iodine metal	g	50
	starch	g	200
	methyl red	g	5
	sodium hydroxide	g	50
	sugar	g	150
	hydrochloric acid	g	200
	acetic acid	g	1180
	Fueling the spirit	g	315
	lamps	g	500
23.	Printed manuals:		
	A set of posters and tables	set	1
	Workbook laboratory work and Workshop on the Biology	unit	360
	Portraits of scientists biologists	set	1
24.	Screen-sonic benefits		
	set of multimedia benefits	set	1
	Electronic manual for teacher “Laboratory work and Workshop on exchange rate biology “	unit	1
	Directory demonstration and teaching and laboratory equipment study biology comprehensive schools and instruction their use	unit	1
25.	Inventory for the care for plants		
	watering can	unit	10
	ripper	unit	10
	Soft brush removal of dust, plants	unit	10
	Brush for washing pots	unit	10
	Clay pots grafting and breeding plants	unit	20
	Pots for grafting houseplants	unit	20
	bucket	unit	5

№	Equipment name	Unit	Quntity for one class (30 places)
	sprayer	unit	5
	oilcloth apron	unit	30
	scoo	unit	10
	magnifier	unit	30
	Pan-washing plants	unit	5
	folder herbarium	unit	7
	roulette	unit	5
26.	Set specialized laboratory furniture:		
	Blackboard classroom wall	unit	1
	demonstration table for the office of biology	unit	1
	Table with the teacher attachment for computer	unit	1
	Table with the teacher attachment for computer	unit	1
	Student Desk laboratory for study biology	unit	15
	armchair of teacher	unit	1
	chairs student	unit	30

Biology class lab

	equipment list	Unit	Quantity
1.	Table for analytical balances	unit	1
2.	analytical balance	unit	1
3.	asher	unit	1
4.	The table under the muffle furnace	unit	1
5.	drying cabinet	unit	1
6.	Refrigerated	unit	1
7.	Walk-in shelving for lab	unit	5-6
8.	Table for the teacher and the laboratory	unit	2
9.	chairs	unit	2
10.	Table distiller	unit	1
11.	Table-trolley for equipment	unit	2

Note:

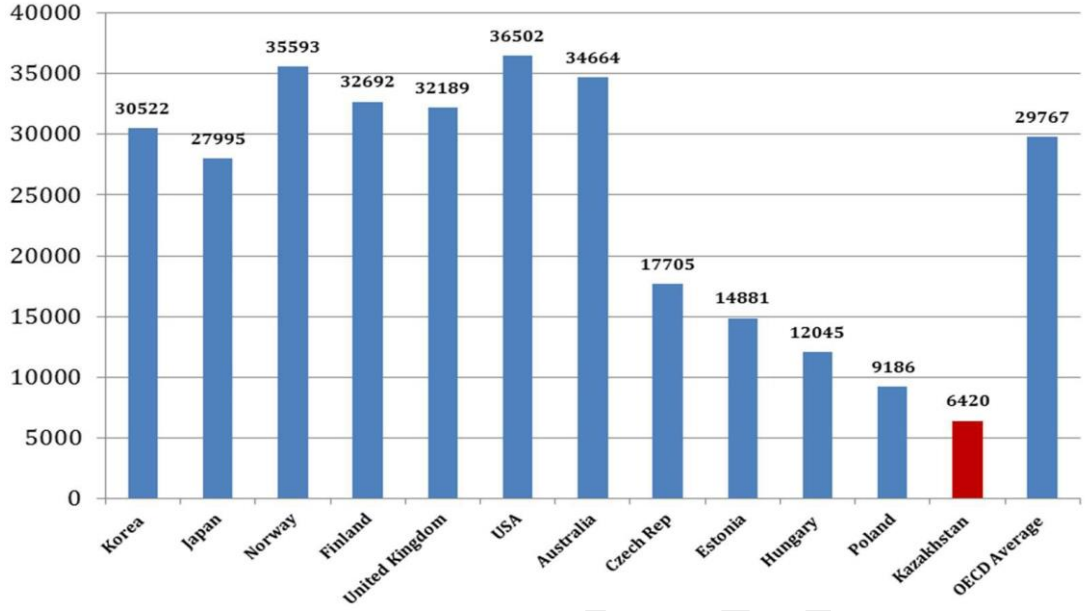
1. Supplier, providing chemical reagents, which are listed precursors, as well as the customer - the organization of education are required to have a state license for activities related to the trafficking of precursors.

Precursors - are chemical reagents used in the production, manufacture, processing of narcotic and psychotropic substances.

2. Equipment for laboratory work must be purchased at the rate of one copy (set) for two students.

APPENDIX L: Teachers starting salary amongst OECD countries compared to average teachers' salary in Kazakhstan (in USD)

Figure 14



Source: OECD at a Glance (2011) and Agency for Statistics (2012)

APPENDIX M: Annual expenditure per student in secondary education across OECD countries compared to per student expenditure in Kazakhstan

Figure 15. Annual expenditure per student in secondary education across OECD countries

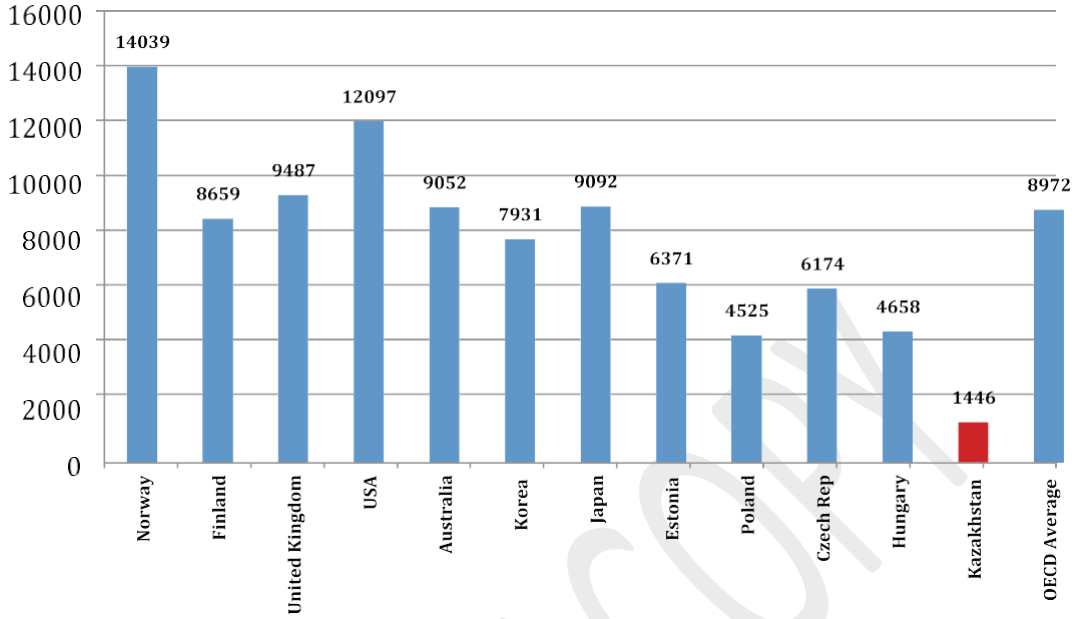
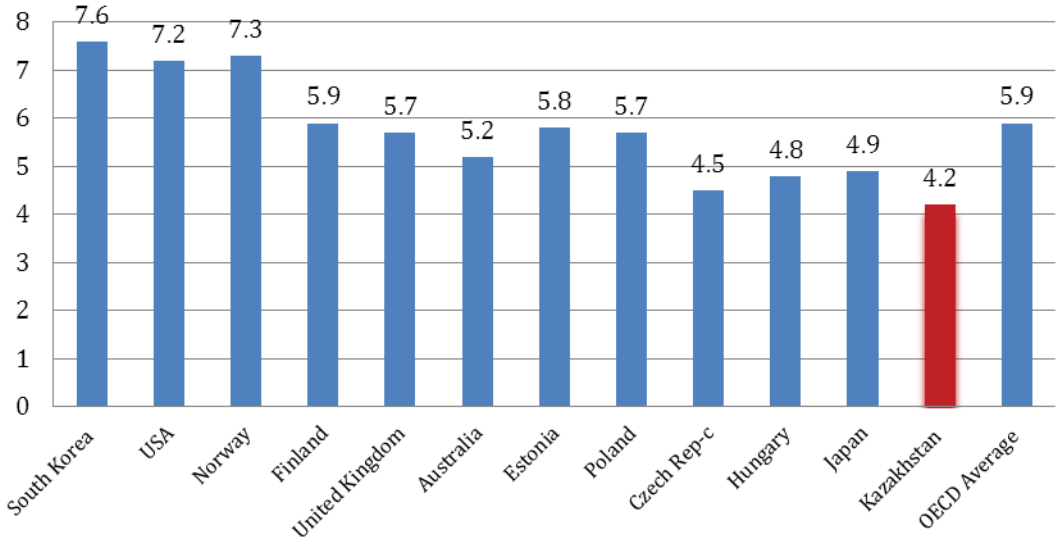


Figure 16. Expenditure on education as percentage of GDP in OECD countries and in Kazakhstan



Source: OECD (2011) "Education at a Glance: OECD Indicators" Part B: "Financial and Human Resources Invested in Education" and National Report on Education Development (2012)

APPENDIX N

Table 45. Percentage of the population that has tertiary education by age group (2011)

Age group	25-64	25-34	35-44	45-54	55-64
Australia	38	45	41	35	30
Canada	51	57	58	48	43
Denmark	34	39	37	31	28
Estonia	37	39	35	37	35
Finland	39	39	47	41	31
Ireland	38	47	43	31	23
Japan	46	59	51	47	31
Korea	40	64	49	28	13
United Kingdom	39	47	43	36	31
United States	42	43	45	41	41
OECD average	32	39	34	28	24
Kazakhstan	30	24	32	34	31

Sources: OECD (2013). Education at a Glance 2013, Table A1.3.a. Republic of Kazakhstan, Ministry of Education and Science (MES), National Center for Educational Statistics and Assessment (2013). Statistics of Education System of the Republic of Kazakhstan. Table 1.1

APPENDIX O

Examples of National Goals Related to Educational Attainment

Europe

Tertiary attainment – sustained progress by European Union member countries:

Almost half of member countries have reached the Europe 2020 target of 40% of people aged 30-34 holding a higher education degree or equivalent qualification, according to the latest data. Since the target was announced in 2010, progress has been steady, rising by around one percentage point a year. If current trends continue, the European Union should meet its target by the end of the decade.

Increasing the level of educational attainment of the labour force is a major EU objective. A highly skilled European work force is fundamental to Europe's global competitiveness and a driver of economic growth and prosperity. It is seen as the key to unlocking Europe's potential for research and innovation. It is also necessary as most new jobs created in the future are expected to be highly skilled.

As well as the Europe 2020 target, almost all member countries have set their own targets for 2020, taking into account national circumstances and policy objectives.

Source: European Center for the Development of Vocational Education, April 10, 2013.

United States

President Barak Obama has set a goal that by 2020 the USA will have the highest proportion of college graduates in the world. The USA now ranks 10th in the world in the educational attainment of the 25-34 year-old population. A majority of USA states have now set long-term goals for increasing the tertiary-level education attainment of their populations. *Source:* http://www.whitehouse.gov/issues/education/higher-education

A recent Georgetown University report indicates that:

- There will be 55 million job openings in the economy through 2020.
- By educational attainment: 35 per cent of the job openings will require at least a Bachelor's degree, 30 per cent of the job openings will require some college or an associate's degree and 36 per cent of the job openings will not require education beyond high school.
- Most jobs will require some type of post-secondary education, and individuals that only possess a high school diploma will have fewer employment options.
- The United States will fall short by 5 million workers with postsecondary education – at the current production rate – by 2020.

Source: Job Growth and Education Requirements through 2020. Carnevalle, A.P. Smith, N., and Strohl, Center on Education and the Workforce, Georgetown Public Policy Institute, Georgetown University, June 2013

APPENDIX P

Table 46. Partners of the autonomous educational organisation "Nazarbayev University"

No.	Nazarbayev University Unit	University-partner
1.	Preparatory Center	University College London (University college London), United Kingdom
2.	School of engineering	University College London (University college London), United Kingdom
3.	School of Humanities and social sciences	University of Wisconsin-Madison (University of Wisconsin-Madison), United States
4.	School of science and technology	Carnegie Mellon University (Carnegie Mellon University, United States)
5.	School of public policy	School of public policy, Lee Kuan Yew, National University of Singapore (Lee Kuan Yew Schoolof Public Policy, National University of Singapore), Singapore
6.	School of business	Fuqua School of Business Duke University (Duke University Fuqua Business School), United States
7.	School of medicine	The question of long-term cooperation with Duke University or the University of Pittsburgh (Duke University or University of Pittsburg), United States
8.	Graduate School of Education	University of Pennsylvania (United States) and Cambridge University (University of Pennsylvania and Cambridge University), United Kingdom
9.	Center of life sciences	University of Pittsburgh Medical Center (University Pittsburgh Medical Center), United States
10.	Center for energy research	Berkeley National Lab (Lawrence Berkeley National Laboratory, United States)
11.	Interdisciplinary Instrumentation Center	Argonskaâ National Laboratory (Argonne National Laboratory, United States)

Source: ACS Data: "Nazarbayev University"